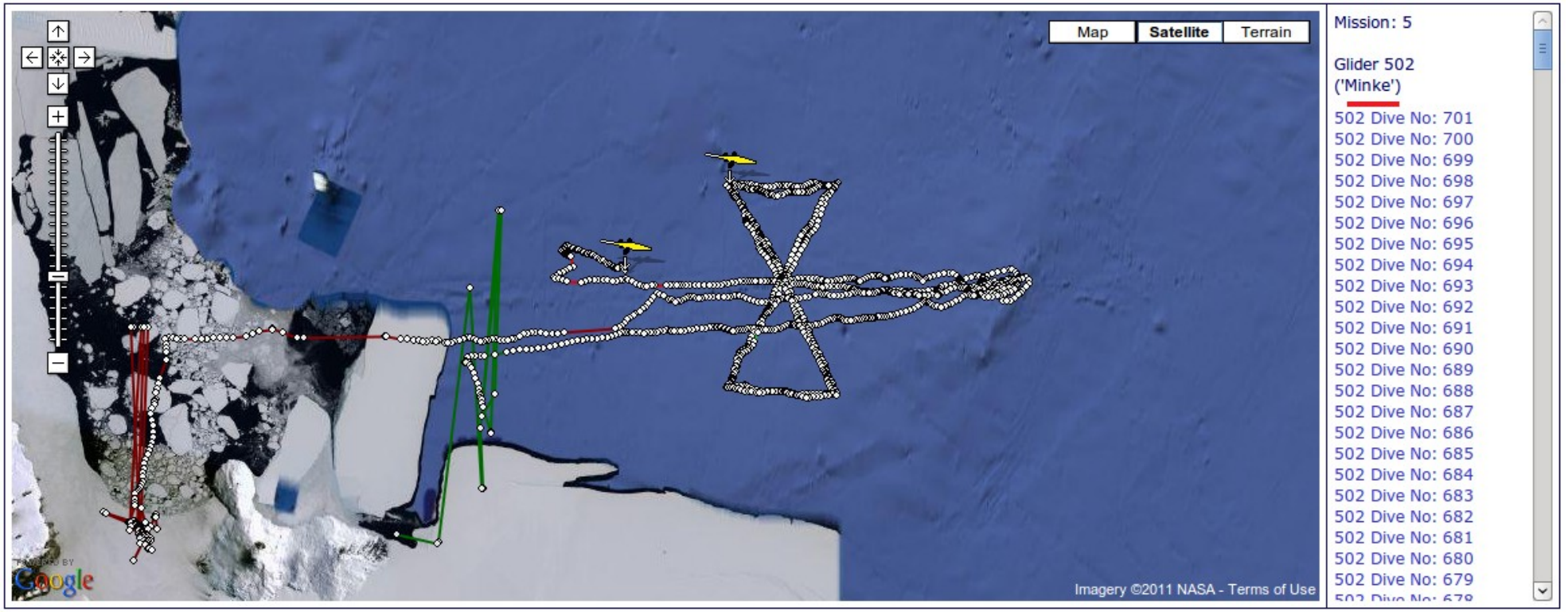
Seaglider deployment in the Ross Sea

advantages of glider platforms
and preliminary results

Bastien Queste

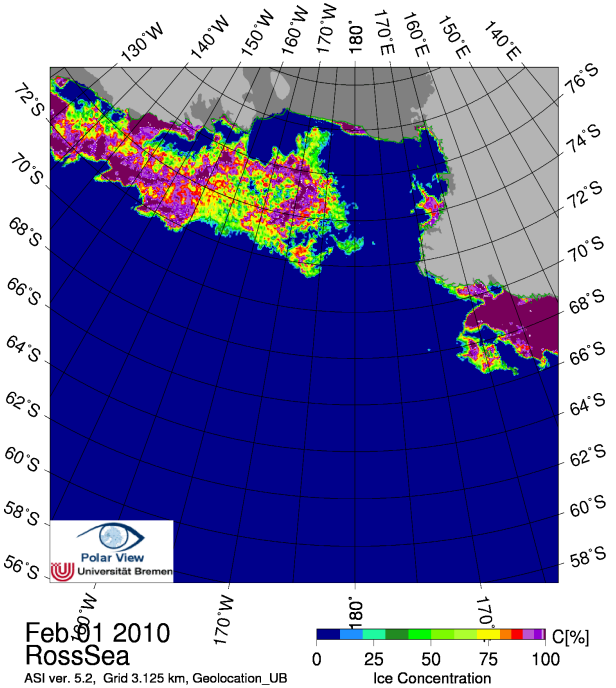
- Seaglider 502:
  - 701 dives
  - 22 Nov '10 – 20 Jan '11
  - 1341 km
- Seaglider 503:
  - 923 dives
  - 29 Nov '10 – 30 Jan '11
  - 1671 km
- Gliders were piloted from the University of Washington

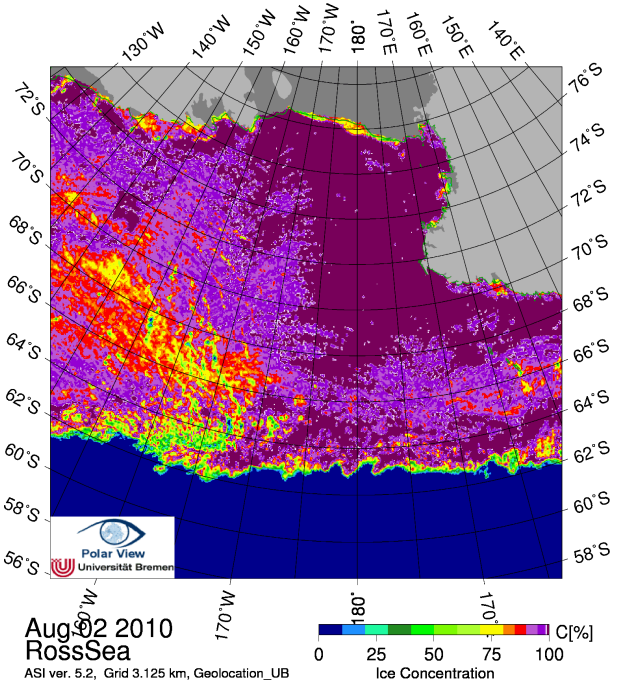


- Project rationale:
  - Following from previous work performed on the IVARS project.
  - Now GOVARS aims to accomplish what we did with moorings on the last project. Our goal is to study the interannual variability in the Ross Sea.

- Need for data on the appropriate time and spatial scales to describe the physical and biological oceanography through the growing season. Data will be used to evaluate an eddy-resolving coupled circulation-biological model and an ecosystem model.

- So why use gliders?
  - High resolution on meso-scale
  - Accessibility
  - Cost
  - Simultaneous measurements
  - Fun





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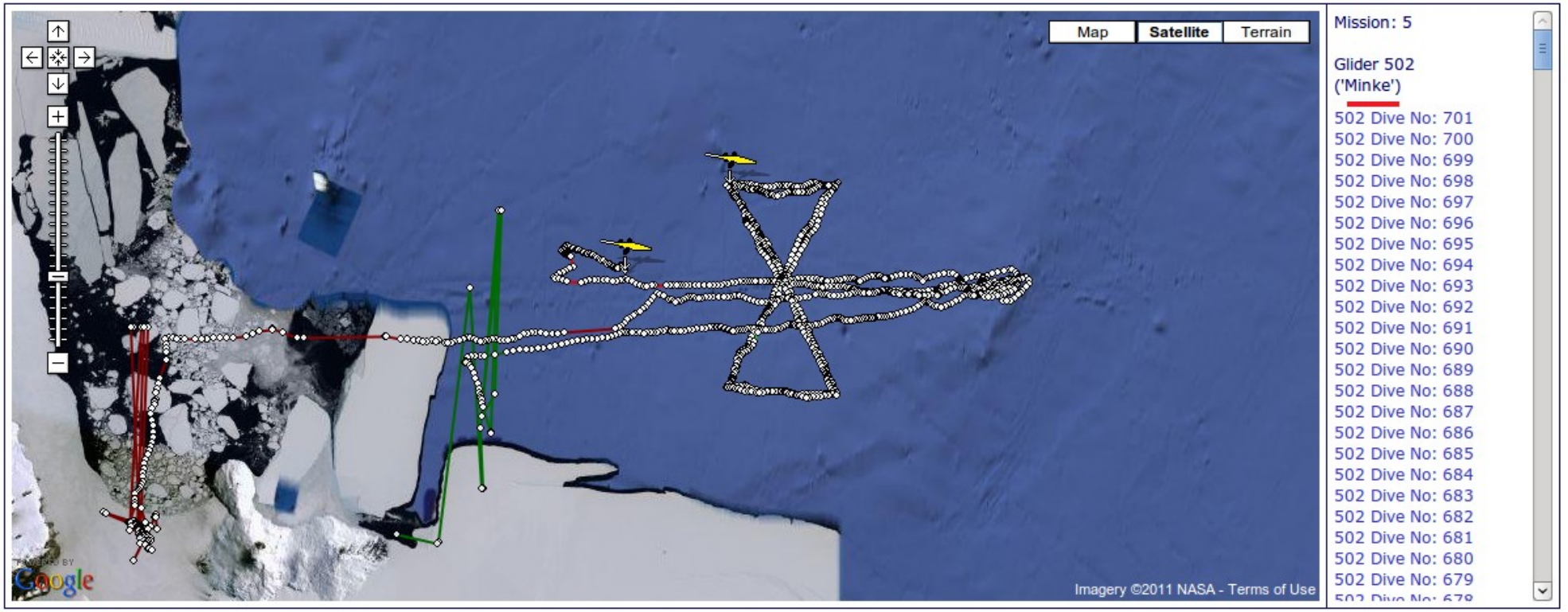
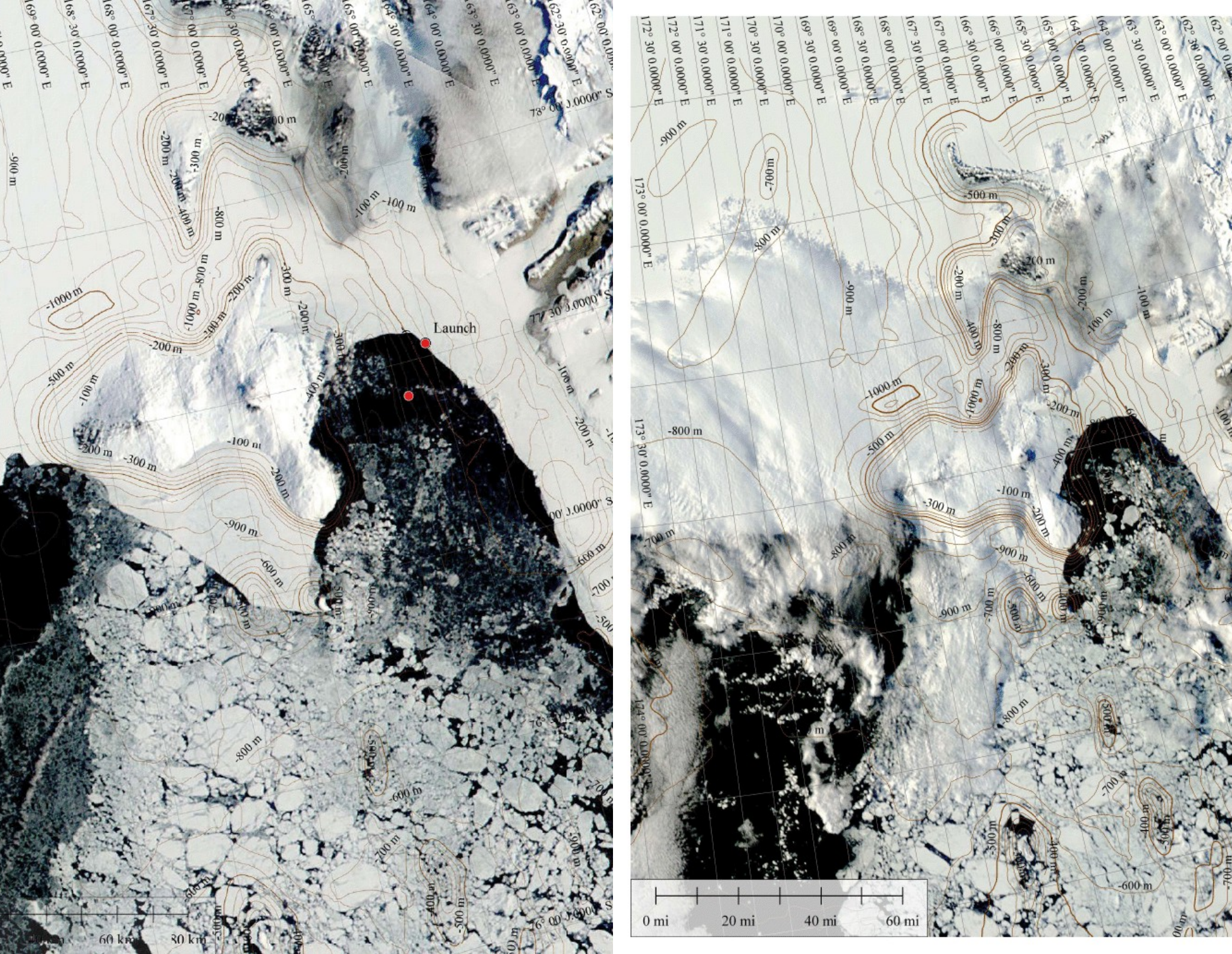
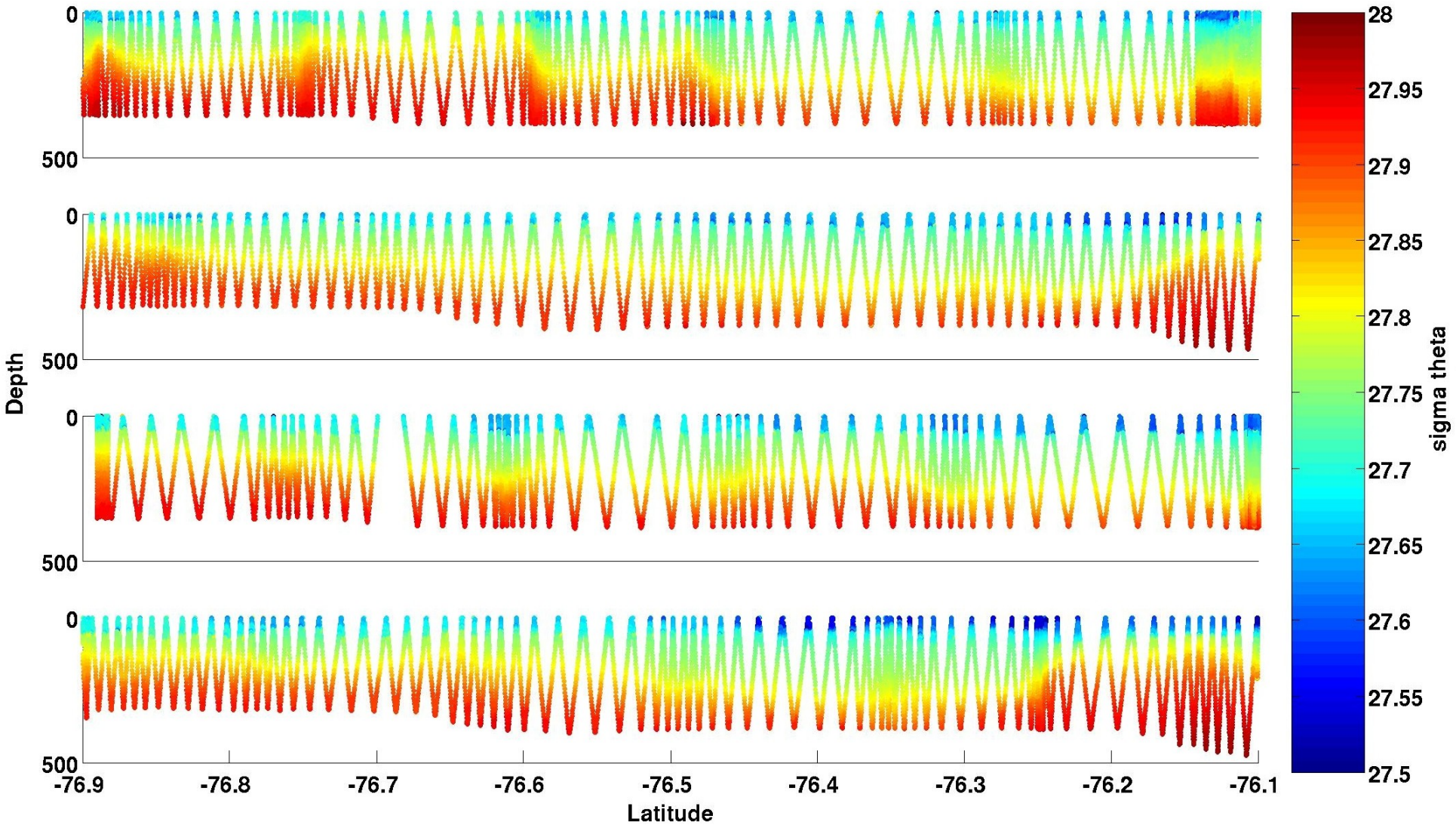



Launch
0 mi
20 mi
40 mi
60 mi
60 km
80 km

30 mi
50 mi
70 mi

10 mi
30 mi
50 mi
70 mi

- Produces high spatial and temporal resolution image of mesoscale physical processes



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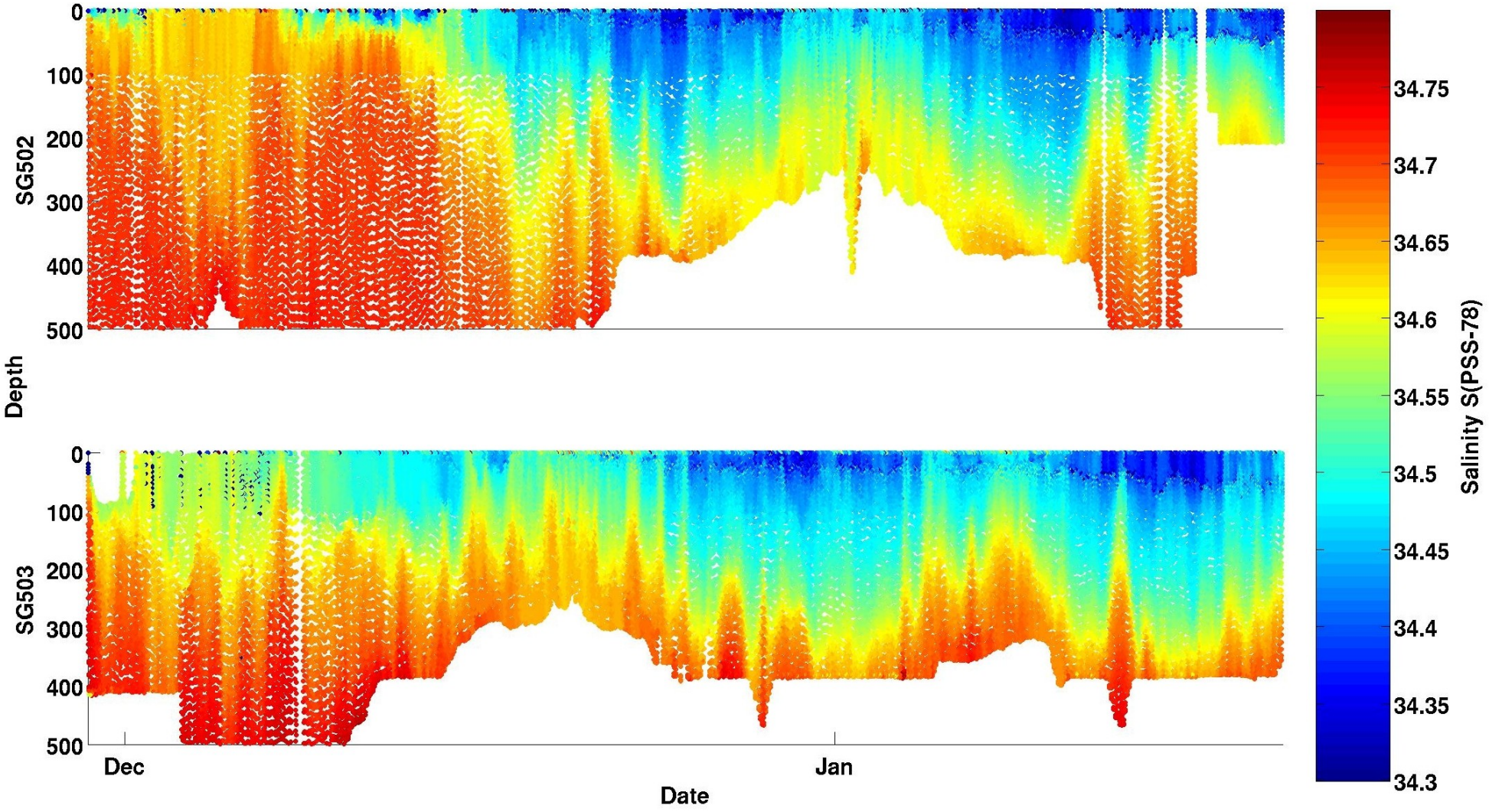
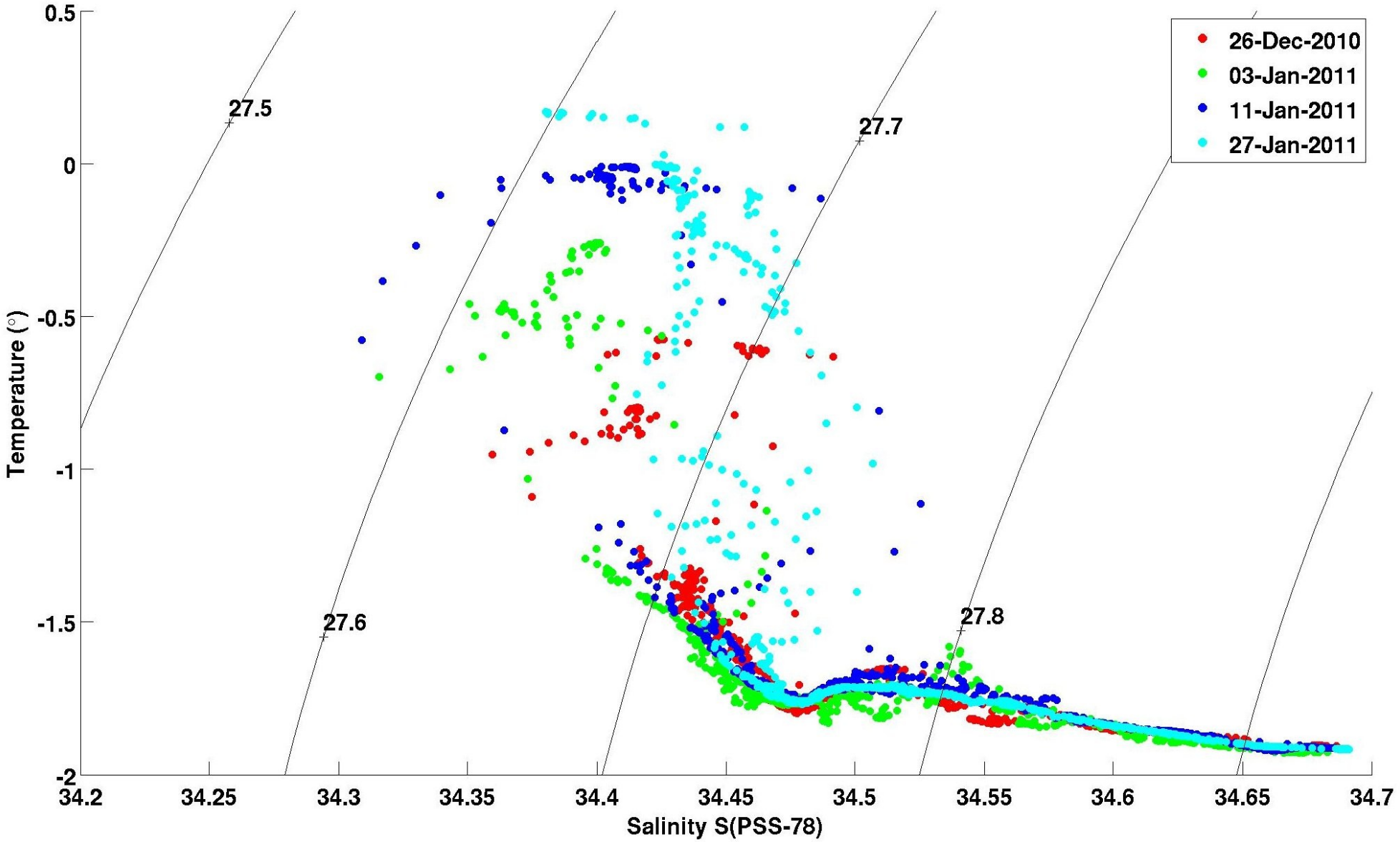
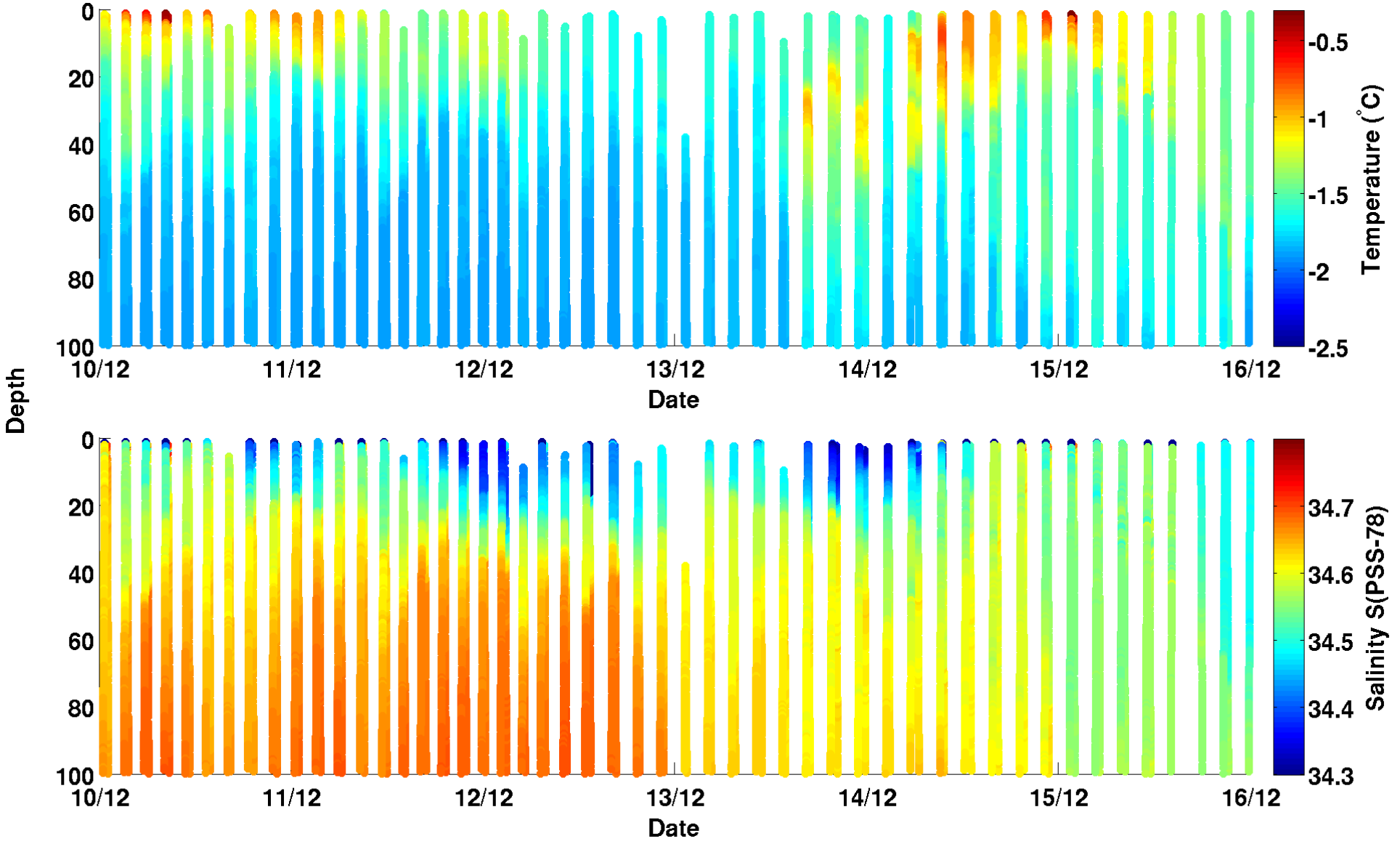
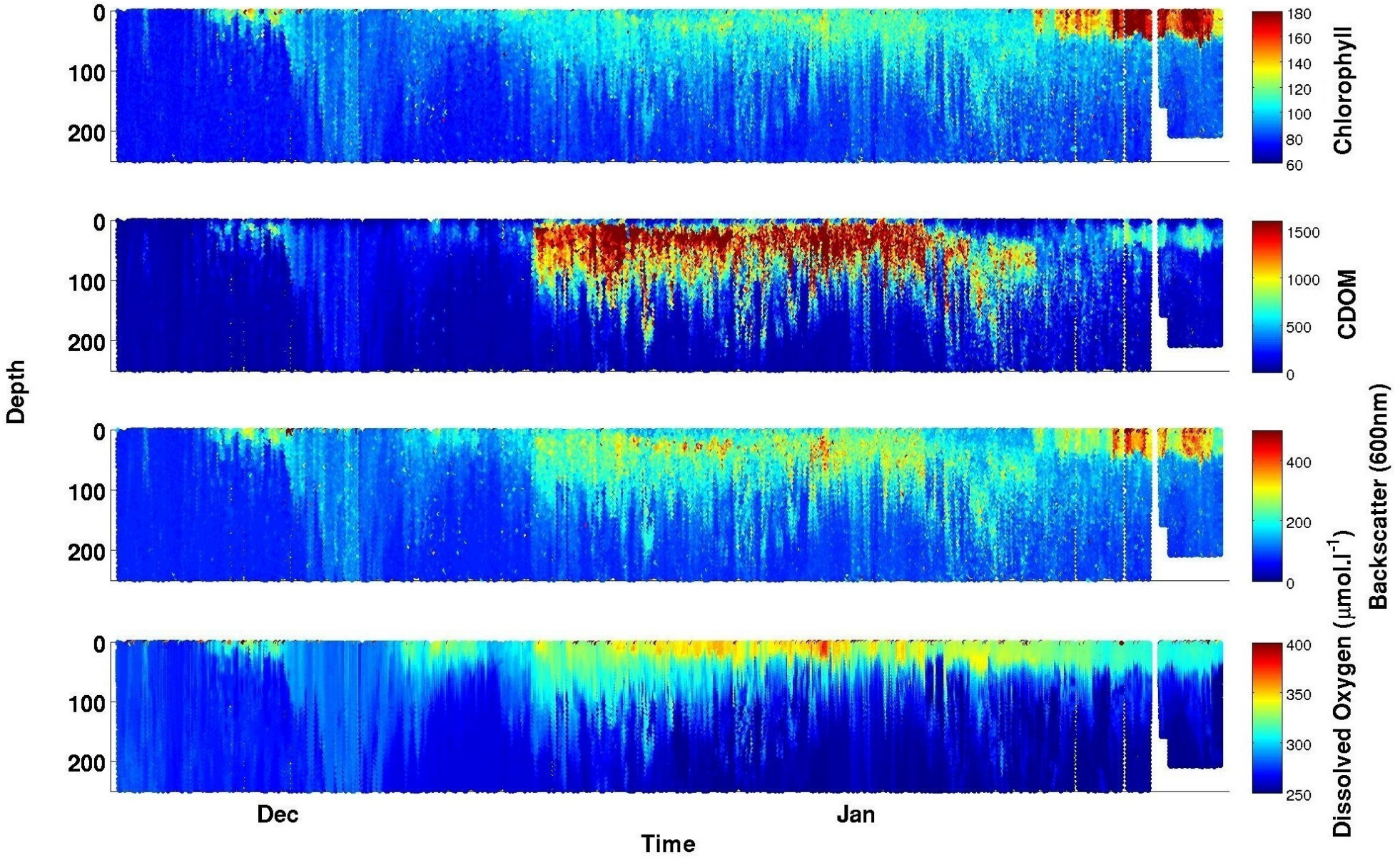



0.5
0
-0.5
-1
-1.5
-2
Temperature (°)
34.2
34.25
34.3
34.35
34.4
34.45
34.5
34.55
34.6
34.65
34.7
Salinity S(PSS-78)
27.5
27.6
27.7
27.8
26-Dec-2010
03-Jan-2011
11-Jan-2011
27-Jan-2011

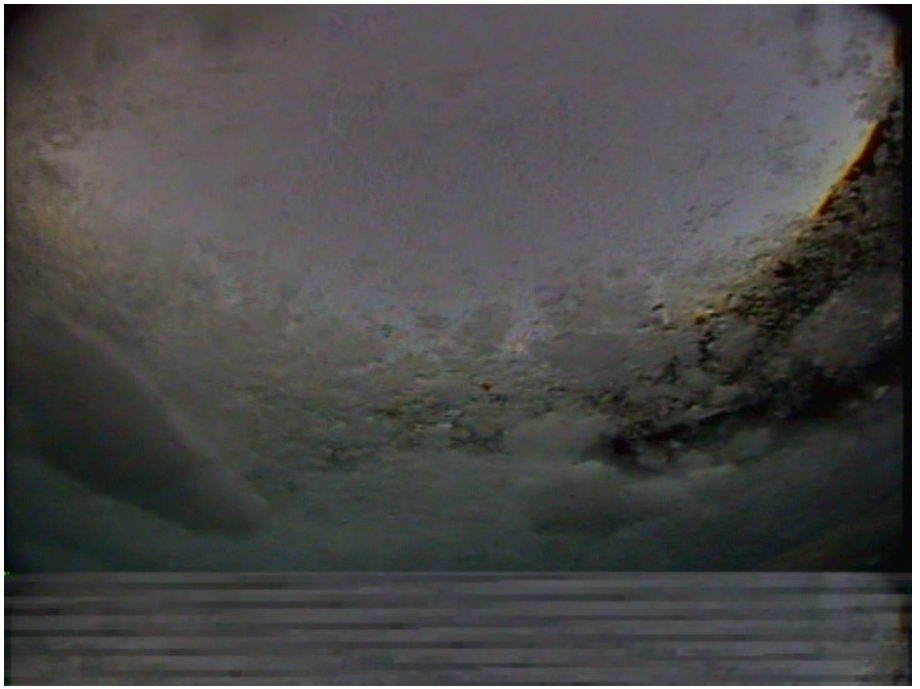
- Flight under the ice bridge

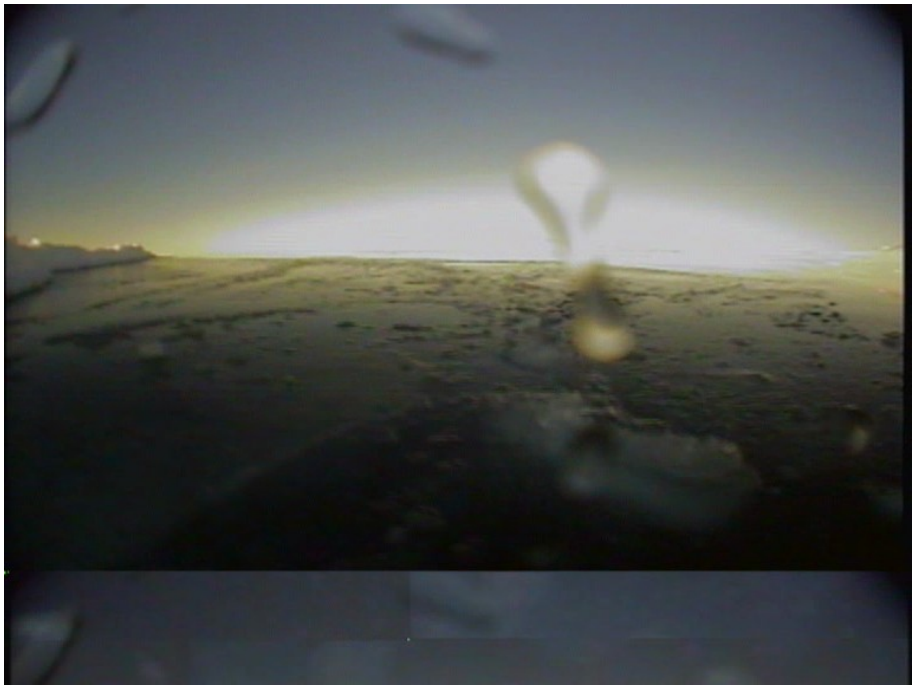


- Clear change of plantkon community composition throughout the bloom



- Issues:
  - Declination
  - Ice conditions
  - Committed launch
  - Effects of cold on batteries
  - Wildlife





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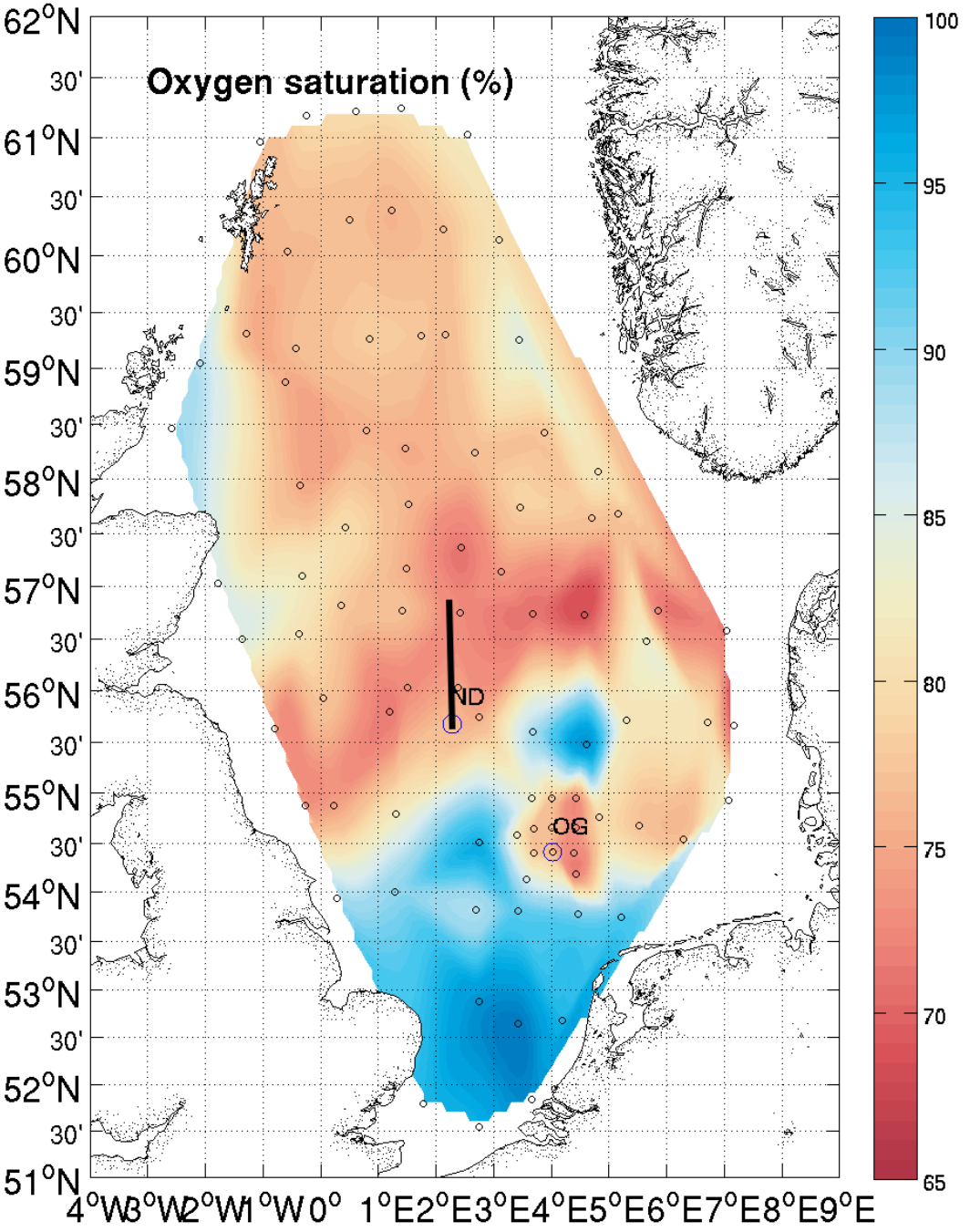
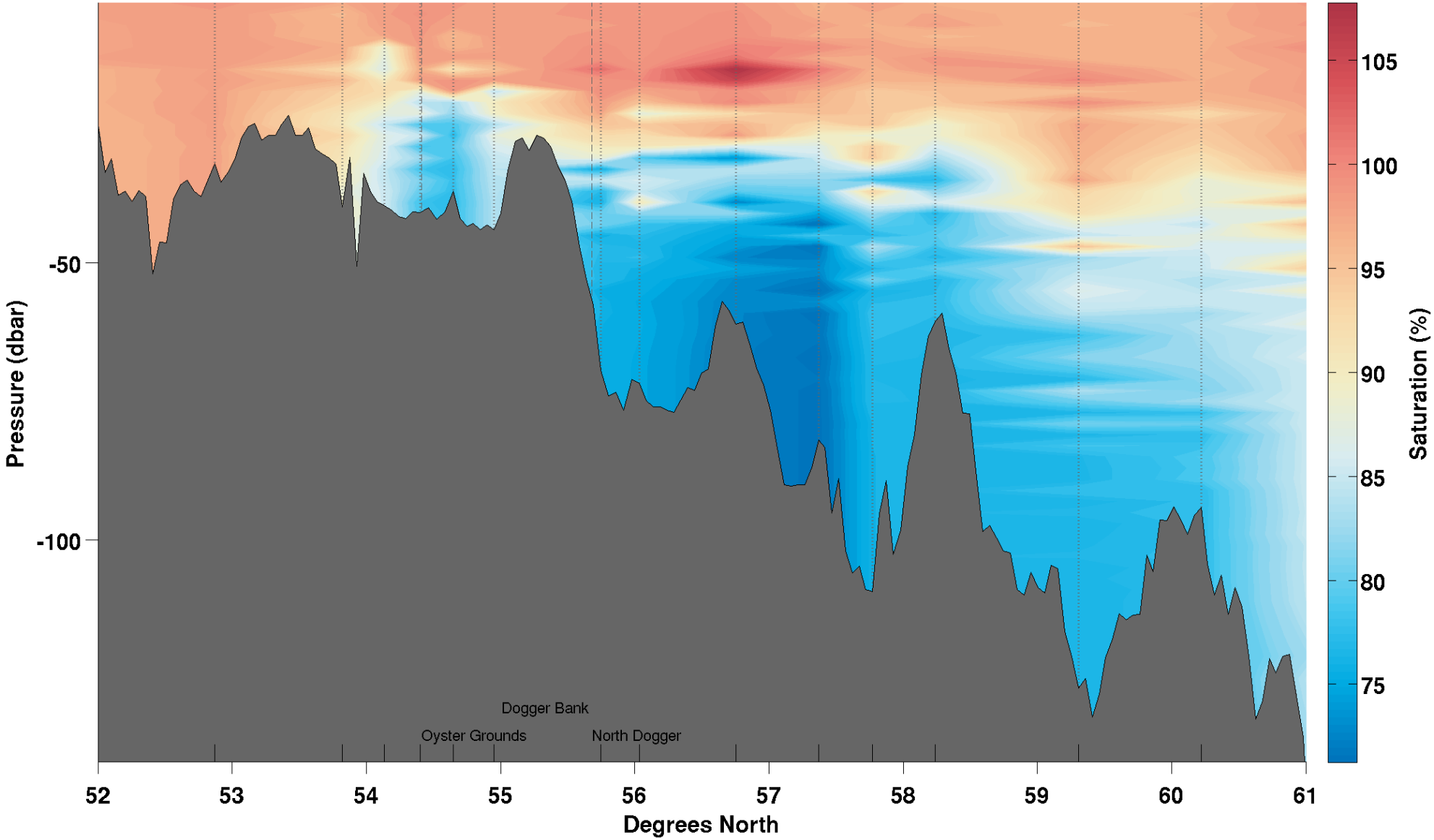
- Overall the gliders did very well. Huge quantity of good quality data of physical, chemical and biological parameters.
- Unprecedented opportunity to measure both under the ice and this early in the season.
- Gliders provided long mission durations despite concerns about battery life in the cold.
- Very resilient: survived some mechanical mishaps, near total ice cover, long periods without surfacing, near freezing temperatures and a committed launch.
- Low cost of redundancy – in missions such as these, the main cost is not the glider or its running costs.
- Different survey patterns to isolate spatial/temporal and answer specific questions.

- Summer 2011 investigation of low oxygen events in the North Sea



- Summer 2011 – investigation of low oxygen events in the North Sea



Thanks for listening !

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B. Queste[a], W. Smith Jr.[b], C. Lee[c], V. Asper[d], M. Dinniman[e], J. Gobat[d], and K. Heywood[a]

[a] *School of Environmental Sciences, University of East Anglia. NR4 7TJ, Norwich, UK*

[b] *Virginia Institute of Marine Science, College of William and Mary, Gloucester Pt., VA 23062, USA*

[c] *Applied Physics Laboratory, University of Washington, Seattle, WA 98105, USA*

[d] *Department of Marine Science, University of Southern Mississippi, Stennis Space Center, MS 39529, USA*

[e] *Center for Coastal Physical Oceanography, Old Dominion University, Norfolk, VA 23529, USA*