

Session OS1.6

Differential summer melt rates of ridges, first- and second-year ice in the central Arctic Ocean during the MOSAiC expedition



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1. Methods: ROV sonar and ice drilling

ROV with a multibeam sonar



Credit: Lianna Nixon

Ice coring / drilling

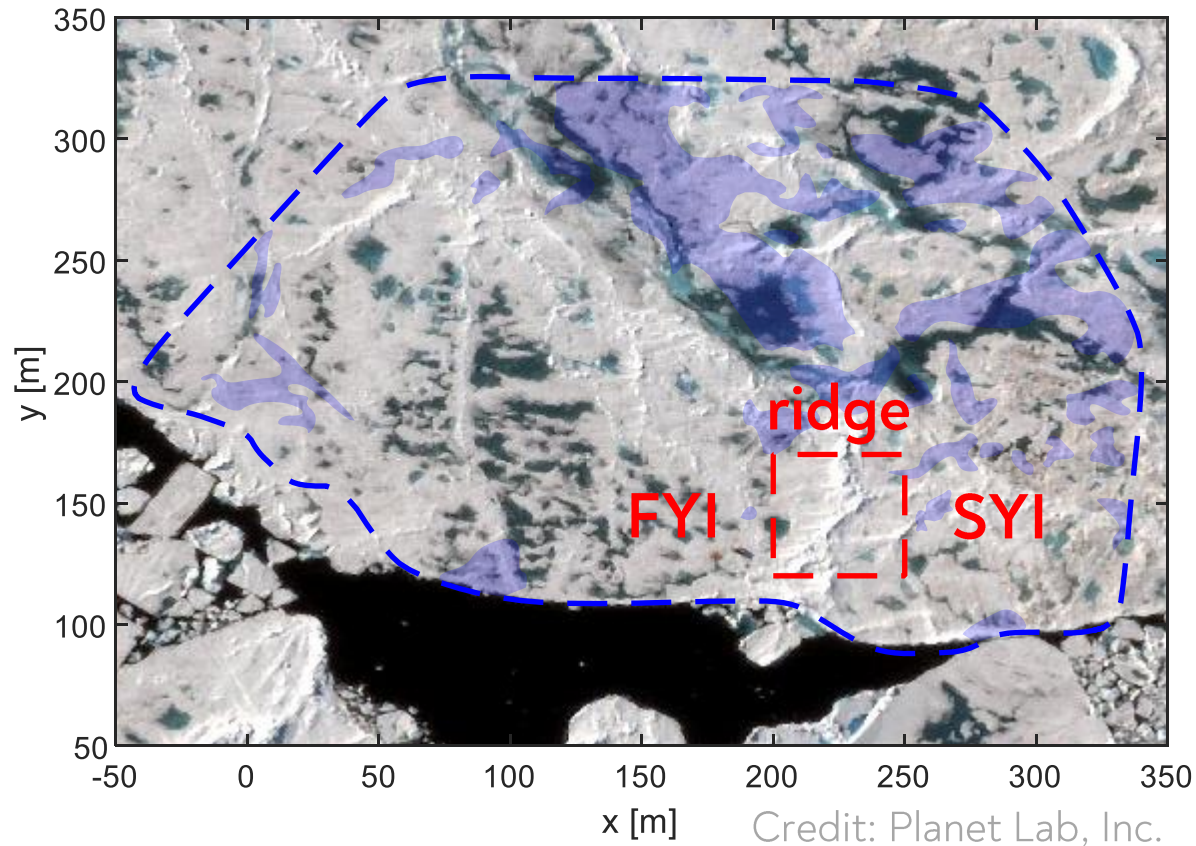


Credit: Lianna Nixon

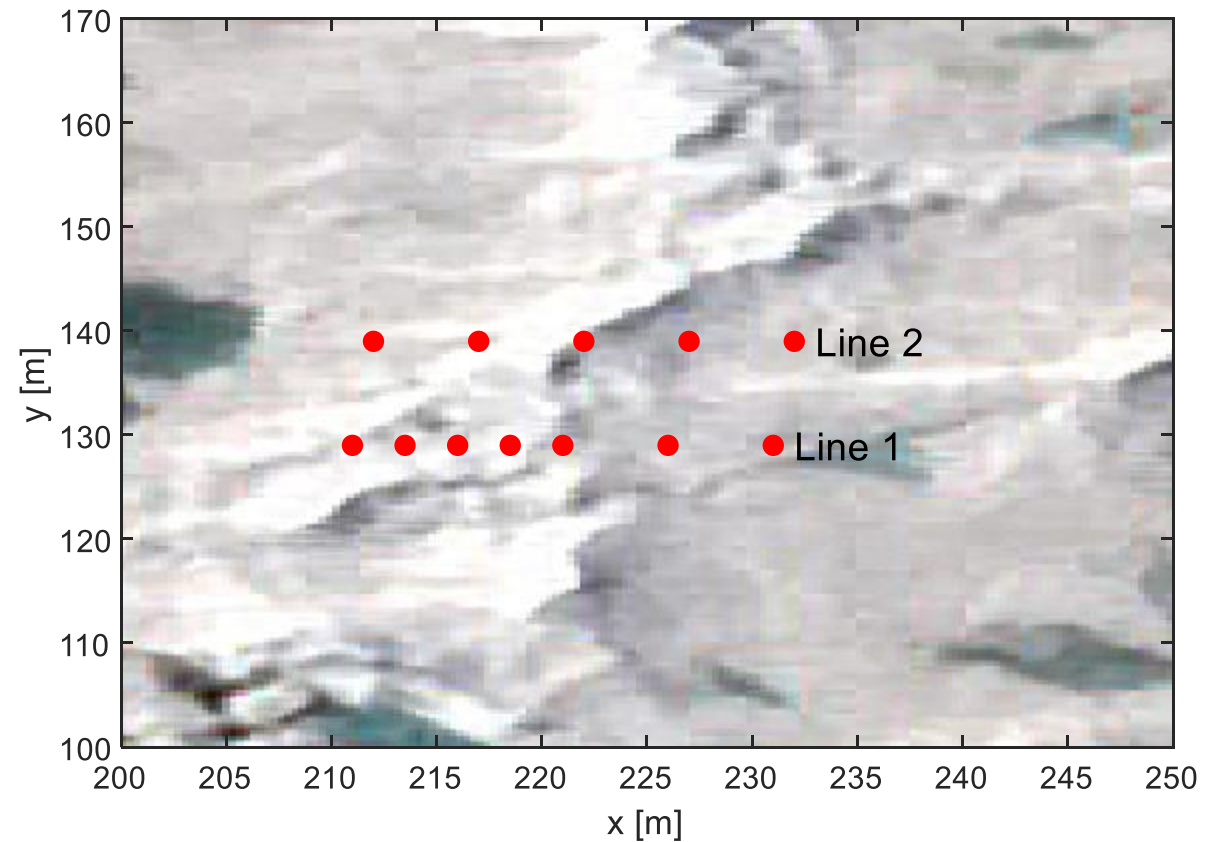
- Location: Fram Strait, leg 4 of MOSAiC
- Time: 24 June – 28 July 2020

1. Methods: location

MOSAiC Central Observatory: ROV oasis

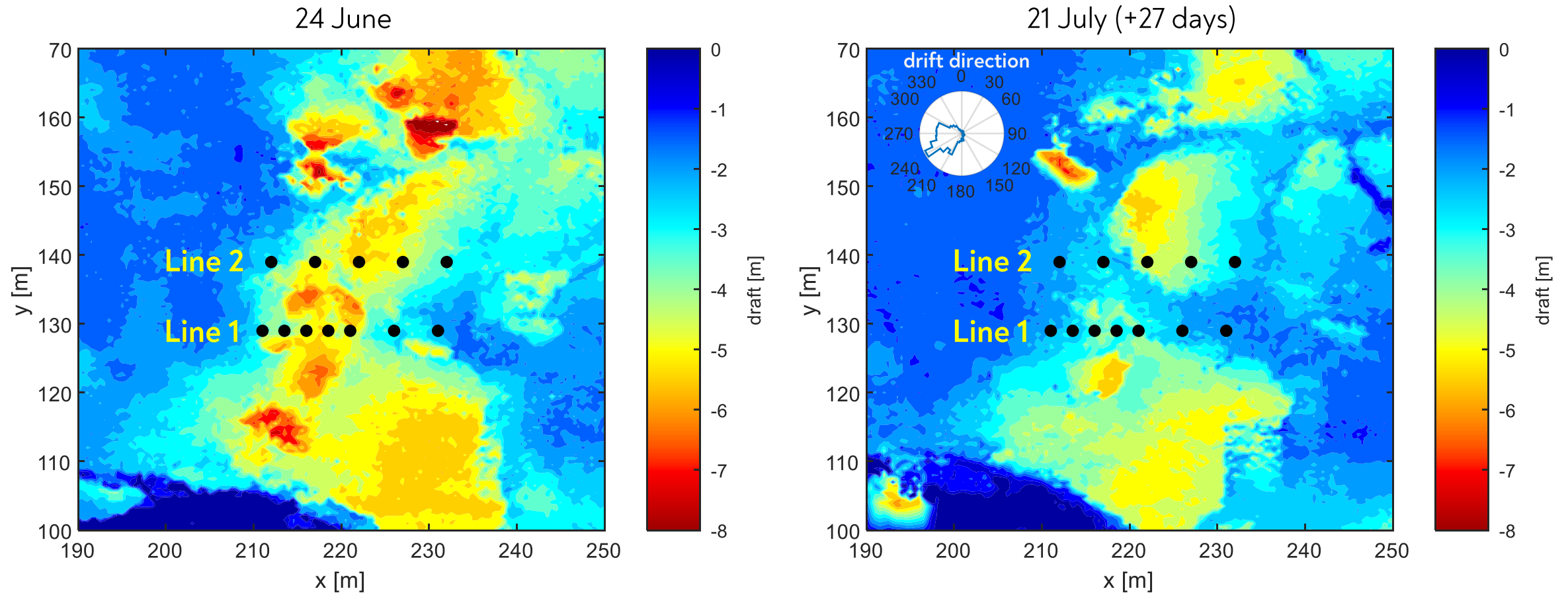


Ice drilling transects

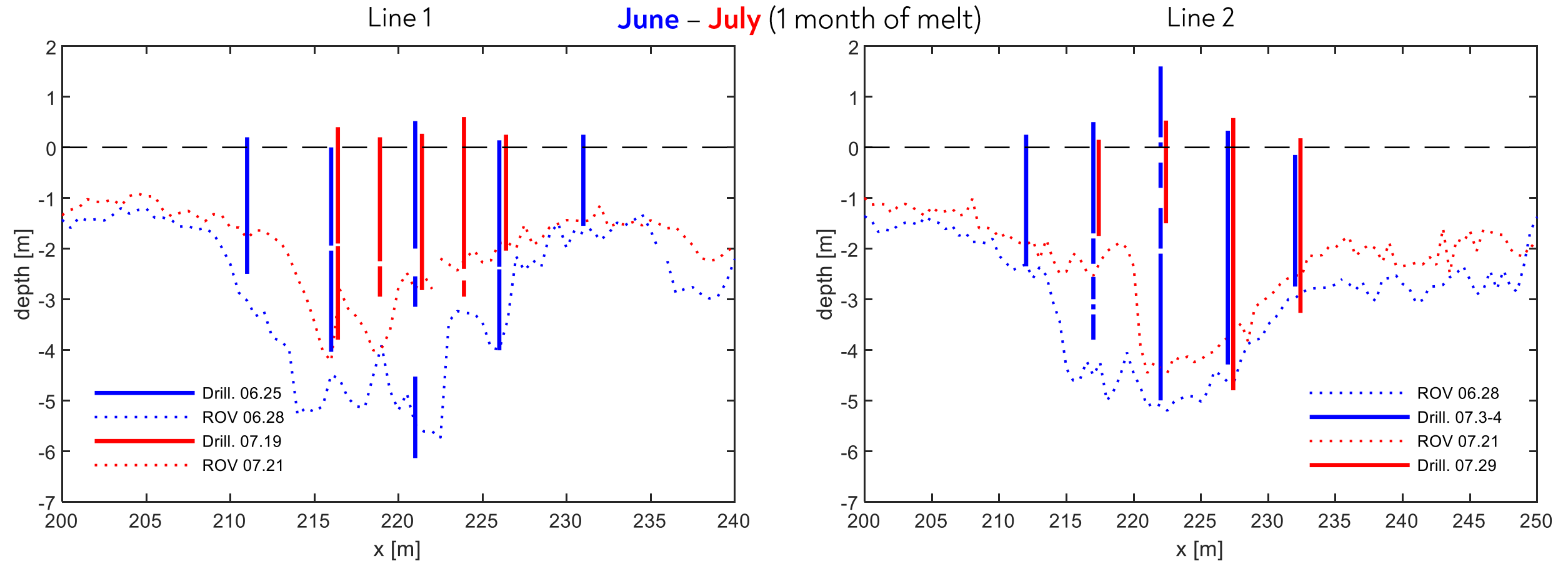


- Three types of ice: first-year ice (FYI), second-year ice (SYI) and ice ridge
- Two ice drilling transects

2. Results: ice bottom topography

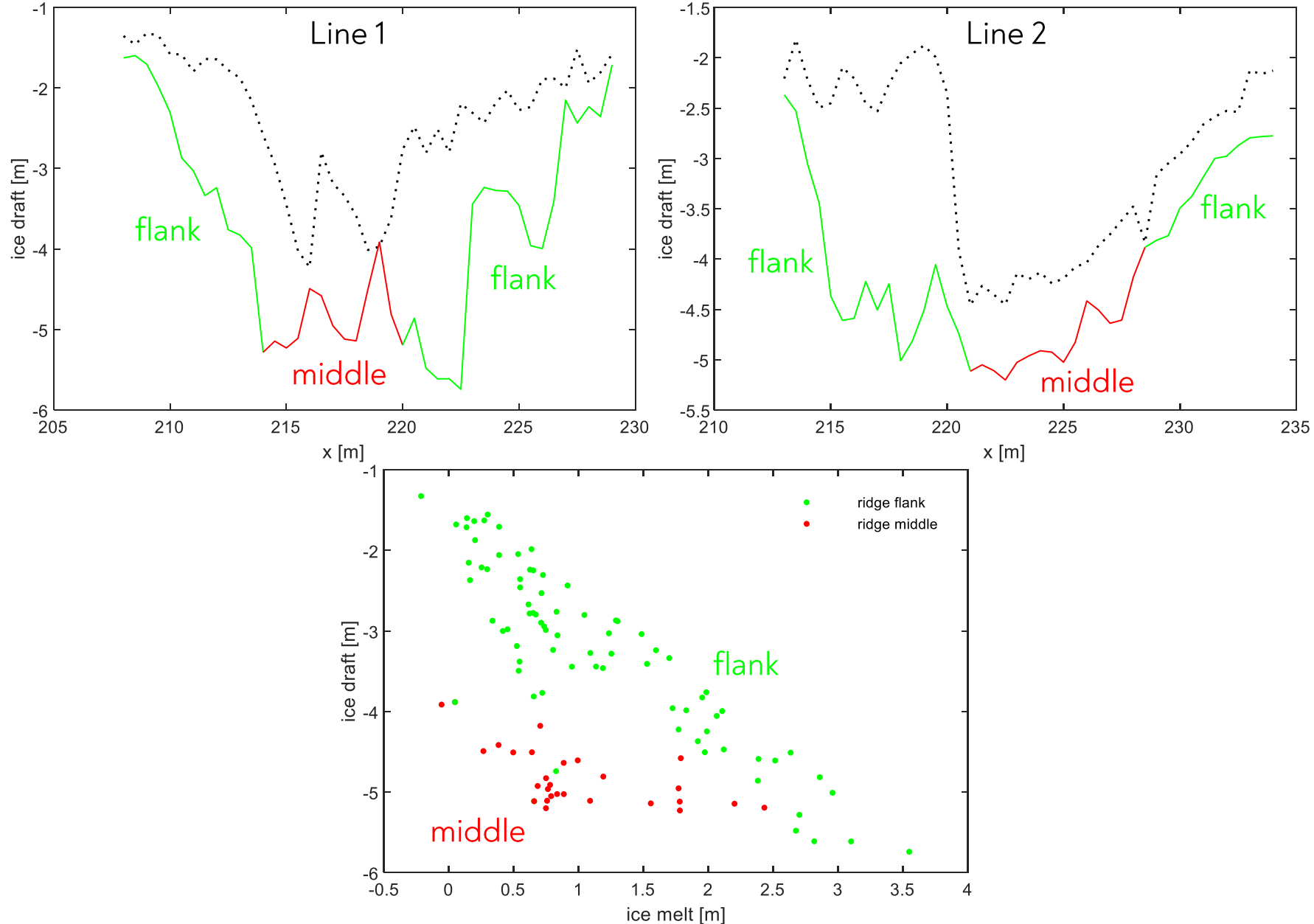


2. Results: ice bottom topography

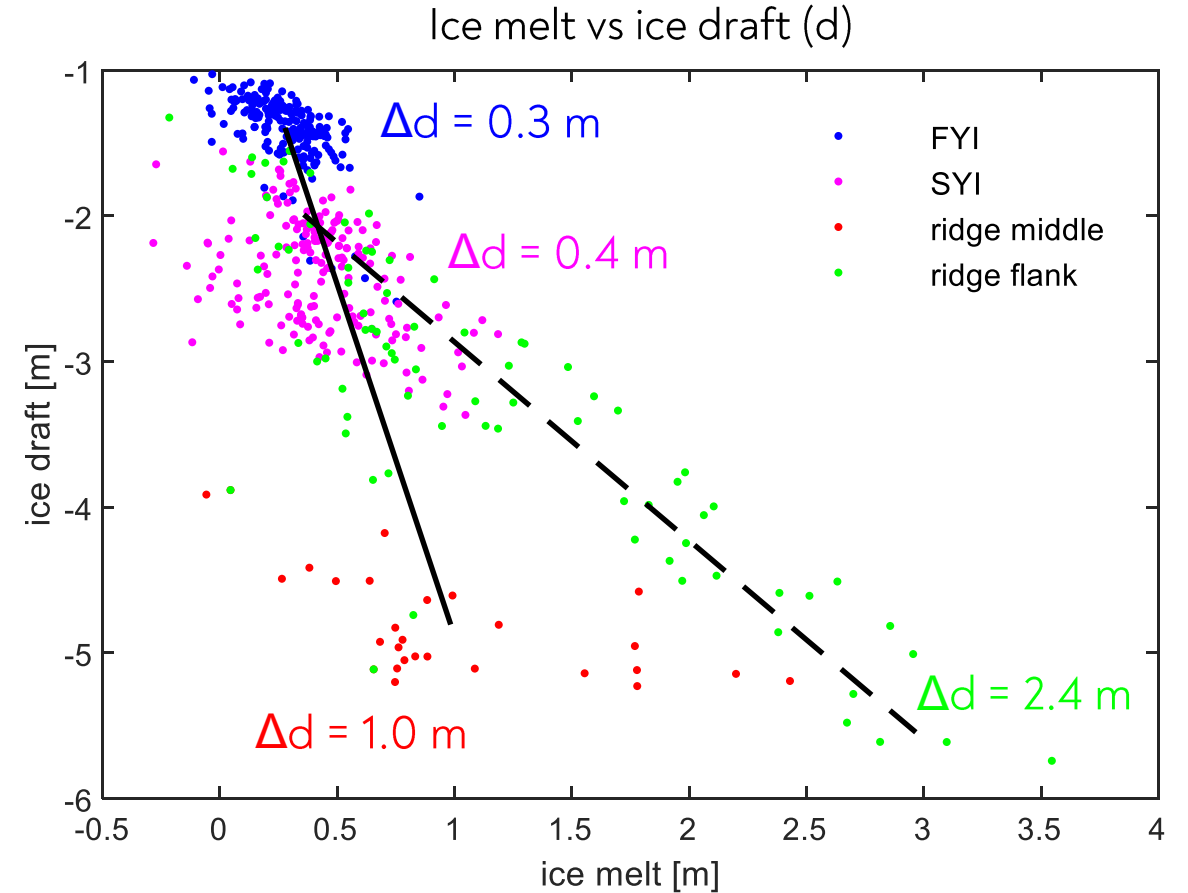
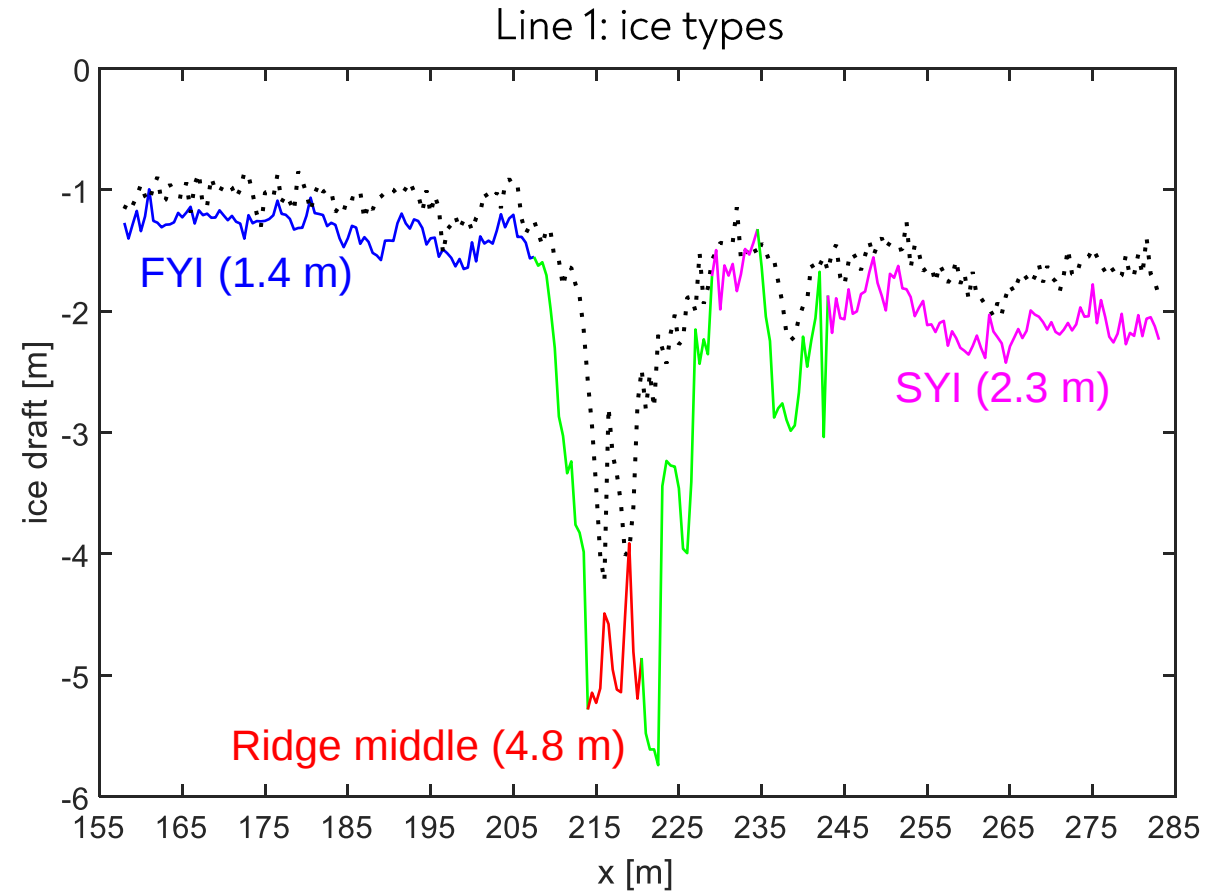


- Good agreement between ROV and drilling
- Asymmetrical ridge melt for line 2

2. Results: ridge parts classification



2. Results: ice melt vs ice draft



- Mean ocean heat flux was 30 W/m² from SIMBA buoy at FYI (bottom melt of 0.3 m)

Summary and conclusions

Results:

1. Ice draft measurements from ROV sonar and drilling were in a good agreement
2. Melt rates for ice ridges (3.7 m) were larger than for FYI and SYI (0.3 and 0.4 m)
3. Melt rates linearly increase with ice draft
4. Ridge flanks were melting 2.5 times faster than ridge middle parts

Thank you.