

The nineteenth week of ice drift (05 - 12 Jan. 2015)

Ice drift

The ice camp moved about 17 nautical miles (31 km) during the week, the shortest distance experienced so far (Fig. 1). For comparison, our maximum distance was 39 nautical miles during week 15. In general, the sea level air pressure over the Beaufort Sea was high and gave us winds from the northeast sector and ice drift to the south. The change in ice drift to the east Monday and Tuesday was forced by a low pressure trough extending north from the New Siberian Islands. Shortly thereafter, another low pressure moved north through the Fram Strait and gave us winds up to 40 knots on Thursday with blowing snow both Wednesday and Thursday. On Saturday morning the wind was down to 6 knots and the southward ice drift stopped completely until Sunday morning. During this period it took up to over 5 hours to move 25 meters-

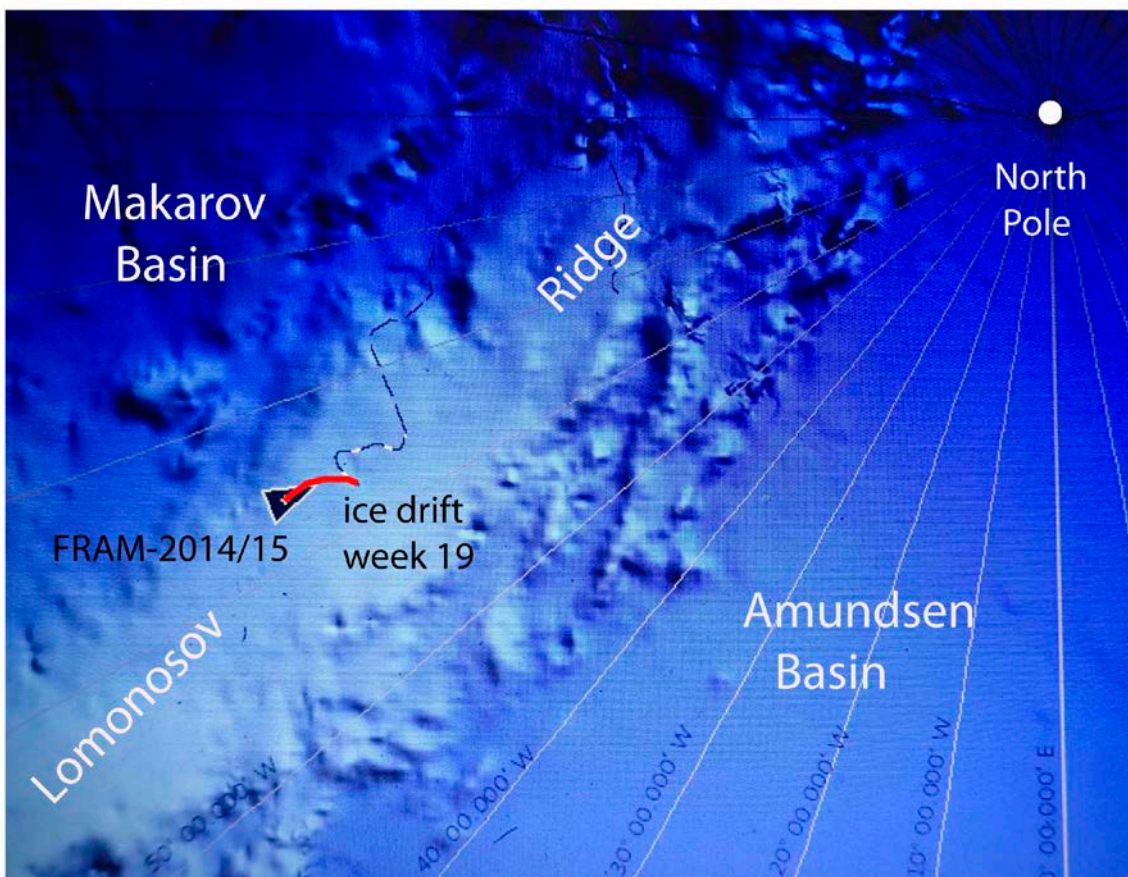


Fig. 1. Drift track (red) of FRAM-2014/15 during week 19 (5-12 January, 2015).

Sea ice dynamics

At 0100 hours on Monday morning Audun discovered a new 20 cm wide crack 25 meter away from the hovercraft. The crack went exactly through the hydrophone hole and passed about 1 meter away from three of our food boxes (Fig. 2). The hydrophone was secured and left in the crack. There has been no motion since. Again on Saturday, we heard intense pressure ridging to the north of our camp. Audun made a reconnaissance on Sunday and discovered a lead of indeterminate width aligned with a pressure ridge. So, pressure ridging and then extension had taken place.



Fig. 2. A new friendly? crack in the neighborhood.

Camp life

Temperatures were below -30°C at the beginning of the week and got 10°C warmer during the end of the week. This has been another quiet week as we have hardly been moving along over the top of Lomonosov Ridge in the direction of Makarov Basin. There are a few small but significant issues to fix - one is the capstan liner of hard plastic (POM). Our past use of the winch to pull the cargo out of the disintegrating camp wore grooves in the POM cap on the drum. The kevlar line no longer slide easily sideways on the drum when we pull in equipment. Ideally, you need a lathe to do remove the grooves, but it is fixable here with more primitive means.

The last day of the week was remarkable; very quiet, no wind, just the air filled with descending snow flakes.

Science

This week, the following suite of continuous measurements has been operating:

Bathymetry and sub-bottom profiling:

- four active autonomous echo sounder buoys reporting to shore via Iridium
- continuous seismic reflection measurements (2 km sub-bottom penetration)

Oceanography:

- two Aanderaa current meters at 800 and 1050 meter depth, respectively.

Atmosphere:

- measurement of incoming and outgoing radiation from the ice surface
- surface infrared skin temperature
- sun time
- Aanderaa weather station

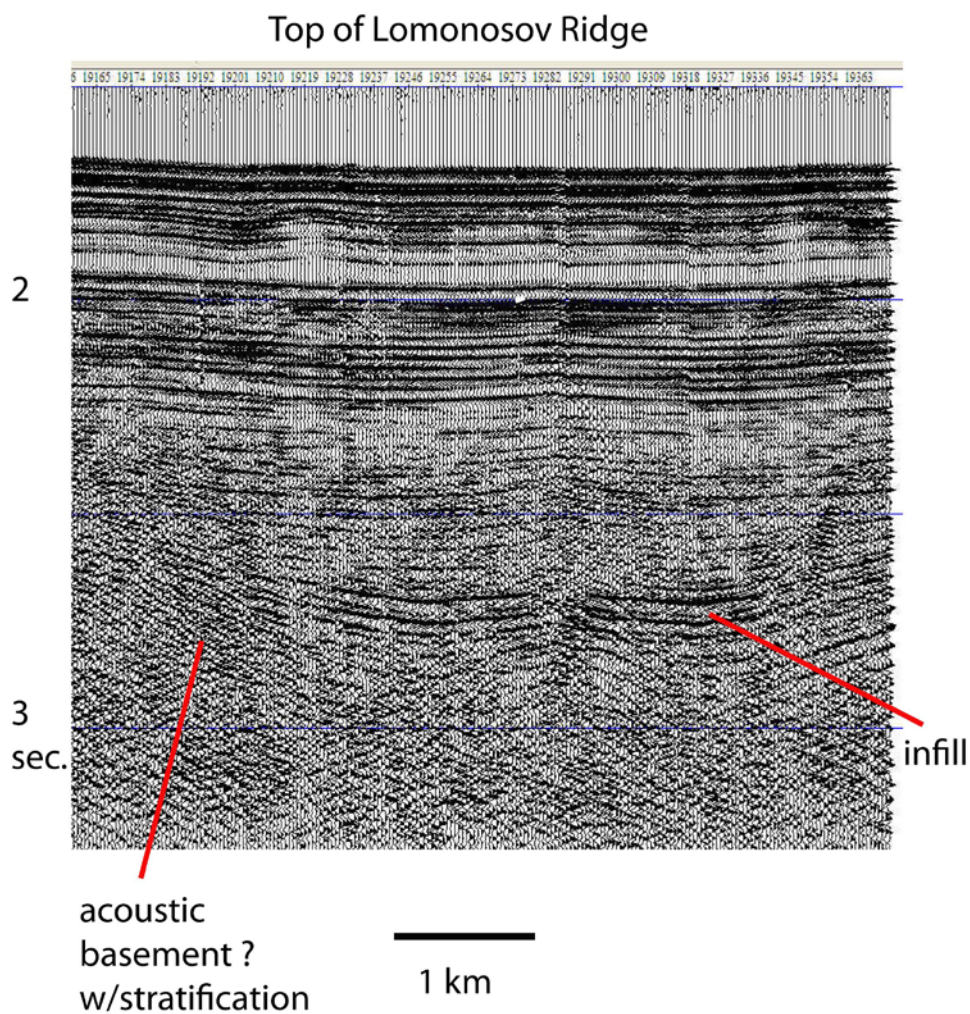


Fig. 3. Screen shot of seismic section on top of Lomonosov Ridge

The seismic data acquisition has been going well as usual. The solenoid valve seems to freeze up every now and then and ask for service.

Acoustic basement on top of Lomonosov Ridge has an indeterminate character (Fig. 3). The lack of a distinct reflective interface remains intriguing. What we assume as basement shows piecewise internal stratification with dips diverging from local basement highs. Possible alternatives are partly eroded anticlines of old sediments or partly eroded effusive volcanic centres.

Audun has downloaded the data from the chain of 30 thermistors; the 26 smaller (model 56) went easy, but the larger ones with pressure sensors (model 39) was more intricate (Fig.4). The total volume is about 150 Mb. The data logging will be restarted and a new deployment made.

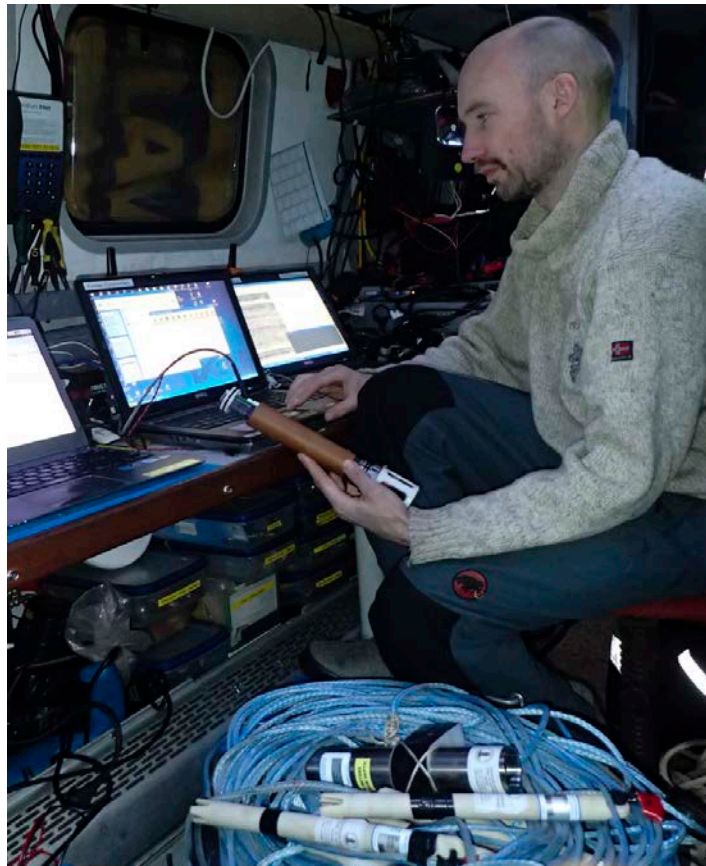


Fig. 4. Downloading data from the temperature data loggers

Life in the High Arctic is treating us well.

Yngve Kristoffersen & Audun Tholfsen



The stars keep us company. The planet Jupiter appears just to the right of the propeller housing.

Daily reports

Monday 05 January.

Position: 87° 34.2' N, 64° 05' W, temperature - 34° C, air pressure 1029 hPa, wind 2 knots from the W. Ice drift 0.2 knots towards E. Shooting seismic reflection all day. Audun discovered a 20 cm wide crack going right through the hydrophone hole and 1 meter away from three of our food boxes. Secured the hydrophone and let it remain in the crack.

Tuesday 06 January.

Position: 87° 35.4' N, 62° 55' W, temperature - 32° C, air pressure 1015 hPa, wind 17 knots from the WSW. Ice drift 0.2 knots towards ENE. Acquiring seismic reflection data all day. Audun downloaded the data from the thermistor probes. One probe had a crack and the electronics was fried.

Wednesday 07 January

Position: 87° 34.4' N, 63° 23' W, temperature - 24° C, air pressure 1008 hPa, wind 19 knots from the ENE. Ice drift 0.3 knots towards the SSW. Acquiring seismic reflection data all day. Had problems with triggering of the air gun in the afternoon and also around midnight. Serviced the solenoid and the problem was fixed.

Thursday 08 January 2015

Position: 87° 27.9' N, 64° 12' W, temperature - 32° C, air pressure 1006 hPa, wind 34 knots from NE. Ice drift 0.3 knots towards SSW. Shooting seismic reflection all day. The air gun stopped triggering around midnight - serviced the solenoid again.

Friday 09 January.

Position: 87° 23.7' N, 64° 03' W, temperature - 18° C, air pressure 1014 hPa, wind 17 knots from ENE. Ice drift 0.1 towards SSE. Put the air gun back in the water at 0200 hours, but the short section of air hose attached to the gun burst. The gun fired at half a meter depth in the hole and we were soaked and the whole room sprayed with ice water. Changed hose and continued seismic reflection measurements all day.

Saturday 10 January

Position: 87° 22.7' N, 63° 58' W, temperature - 21° C, air pressure 1021 hPa, wind 14 knots from the E. Ice drift 0.1 knots due south. The ice drift stopped completely during the day. To move 25 meter took more than 5 hours. Acquiring seismic data all day. Had to end seismic line 2014-12 before midnight and reboot the computer.

Sunday 11 January.

Position: 87° 22.8' N, 63° 57' W, temperature - 18° C, air pressure 1001 hPa, wind 6 knots from the south. Ice drift 0.1 knots towards the northeast. The ice started moving again in the early morning. Started seismic line 2015-13.

