

SIGNAL 2009

Weekly Newsletter #4 (Sunday, June 28)

The last week was very productive as we completed the two lines across and along the extinct spreading axis in Labrador Sea. All OBS were recovered and none of the instruments were malfunctioning. With that we have a really neat data set with dense observations, as our OBS spacing varied only between 11 and 14 km. An initial display of the record sections indicates very interesting lateral variations of the crustal velocity structure along these lines that should help to find out what happened during the final stages of seafloor spreading in Labrador Sea when it ceased around 33 million years ago.

In order to have enough contingency time for the last line in Orphan Basin off Newfoundland to allow for unforeseen events like weather, icebergs, fog and instrument problems, we decided to shorten the line within the extinct spreading axis to a length of 110 km, using only 10 instead of the originally planned 15 OBS. This gave us one extra day for our priority line 1. At the same time we moved the line in the spreading axis 11 km to the north to obtain a better tie with the line across the ridge axis. This will allow for a better definition of possible seismic anisotropy in the ridge region.

While the data acquisition on the line across the spreading axis occurred without any problems, we had some delays due to weather on the cross line. When we finished the shooting at northern end of the line, we had winds that reached gale force and the waves were 4 to 5 m high. Since the winds started to calm at that time we postponed the recovery of the airgun array by three hours. However, during the next attempt, a wave came up the stern and many people got quite wet. The recovery was then delayed for another three hours, before it was safe enough to retrieve the array – but it would have not been possible without the skills of the boatswain and his deck crew, supported by our science staff. The following OBS recovery was complicated by the dense fog that moved in at that time, with visibilities as low as 50-100 m. However, the direction finder on the ship was working very well, showing us the way to the radio beacons that are mounted on the OBS. This operation required a very slow speed but in the end all OBS were safely recovered.

Due to the wind, three of the five sonobuoys that we deployed on the line got entangled in the airgun array. This was related to the fact that it was difficult to predict the motion of the airguns in the swells, when the buoys were thrown in the water. However, otherwise the sonobuoys have proven to work fine and we have 15 sonobuoy deployments planned for line1 to supplement the OBS recordings. We also carried out three XBT measurements around the extinct spreading axis down to a water depth of 1830 m. This will give us the necessary velocity of sound in water that is important to know for the seismic data analysis. The first two XBT had suspiciously high temperatures (up to 13°C) in the deep water, which is why we carried out a third XBT that did not show these anomalies.

Friday morning we started our transit to line 1 where we arrived early this morning and now we are deploying OBS again. The transit was used for a BBQ – but indoors due to weather.

Cheers,
Thomas



Ryan Pike deploying a sonobuoy



Bob Murphy: Expendable bathythermograph (XBT)