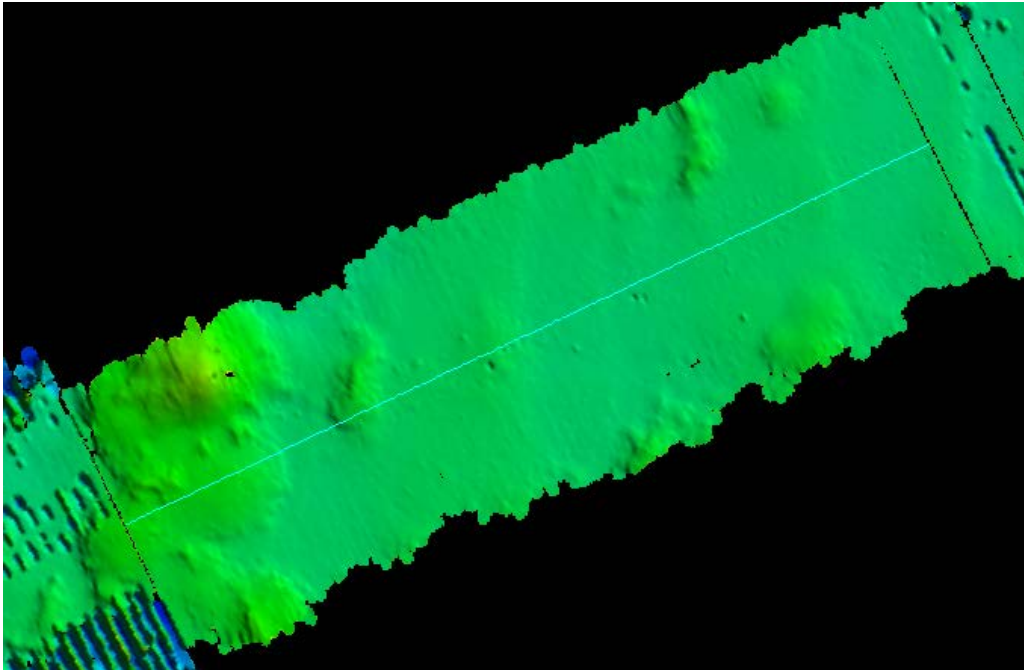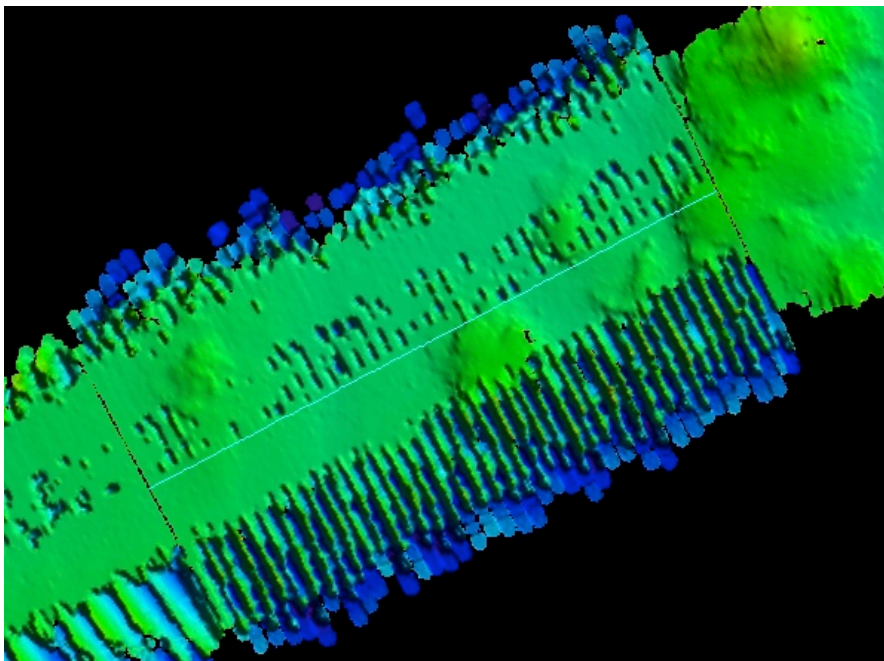The following combinations were run with no KYSNC, in ~5200m depth with calm seas, running down-swell. Lines are highlighted in light blue.

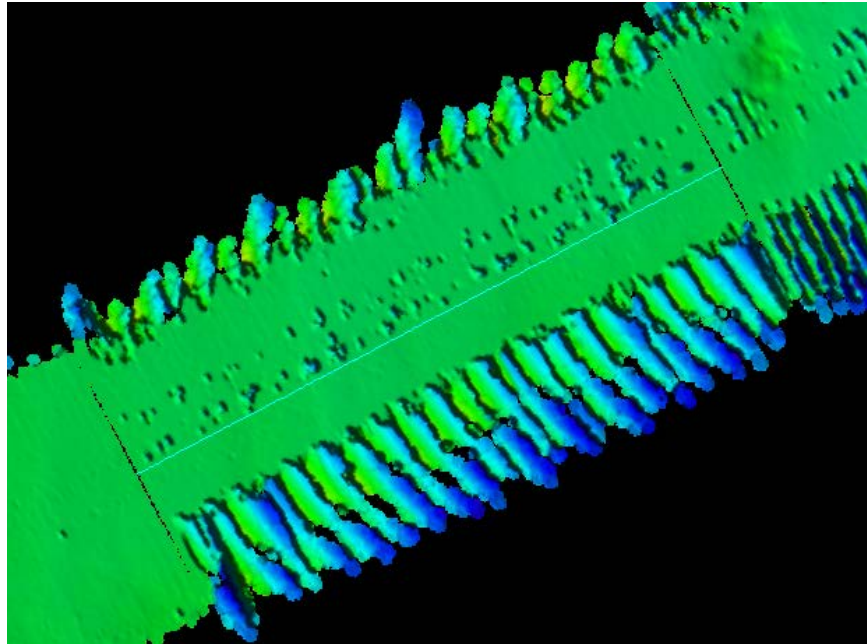## Line 0073 EM302 + No ADCP

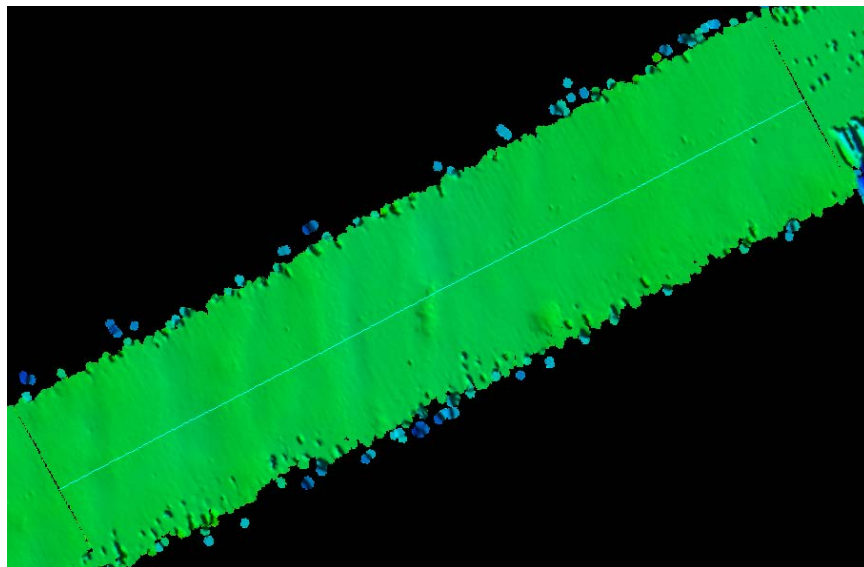Typical multibeam data.

Line 0074 EM302 + OS75 BB & NB (default)

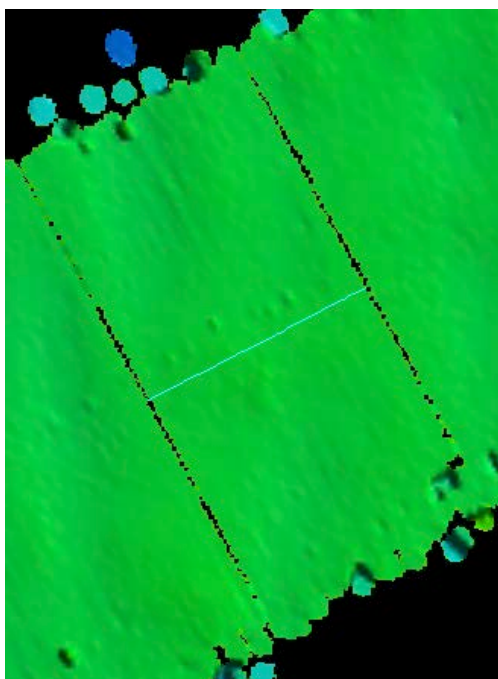Unacceptable multibeam data.

Line 0075 EM302 + OS75 BB

Unacceptable multibeam data.

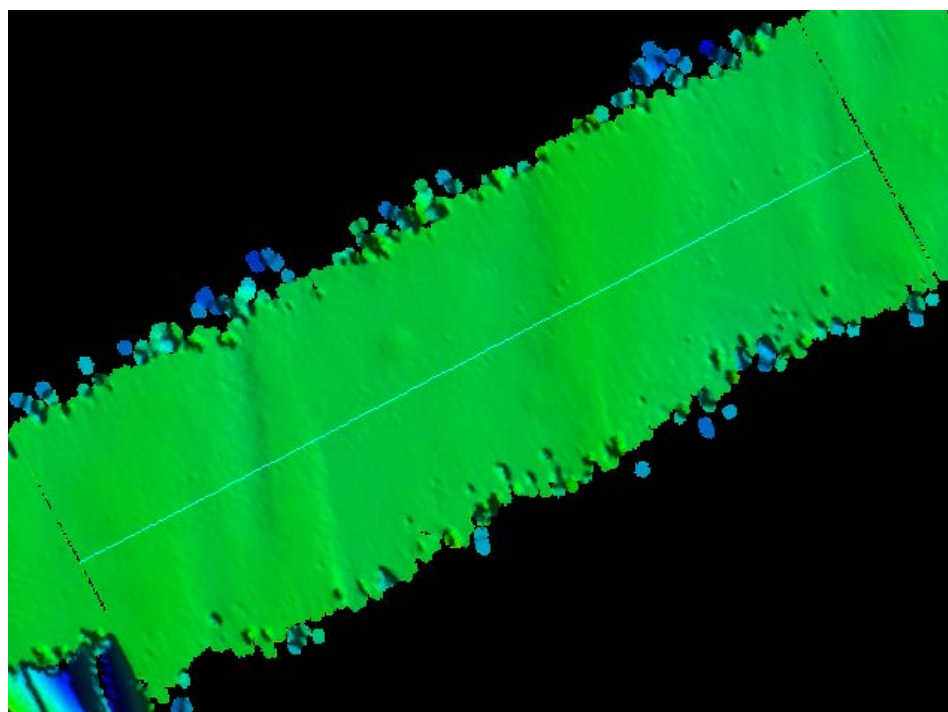**Line 0076 EM302 + OS75 NB (40 bins of 16m)**

Reasonable multibeam data

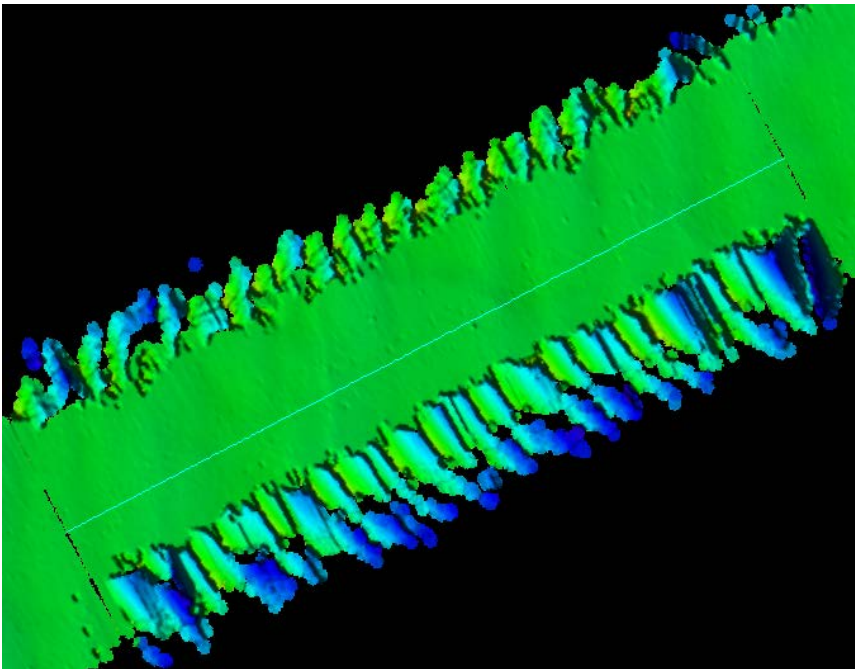**Line 0077 EM302 + OS75 NB (40 bins of 16m)**

Reasonable multibeam data

Line 0078 EM302 + NB change bin size (80 bins of 8m)
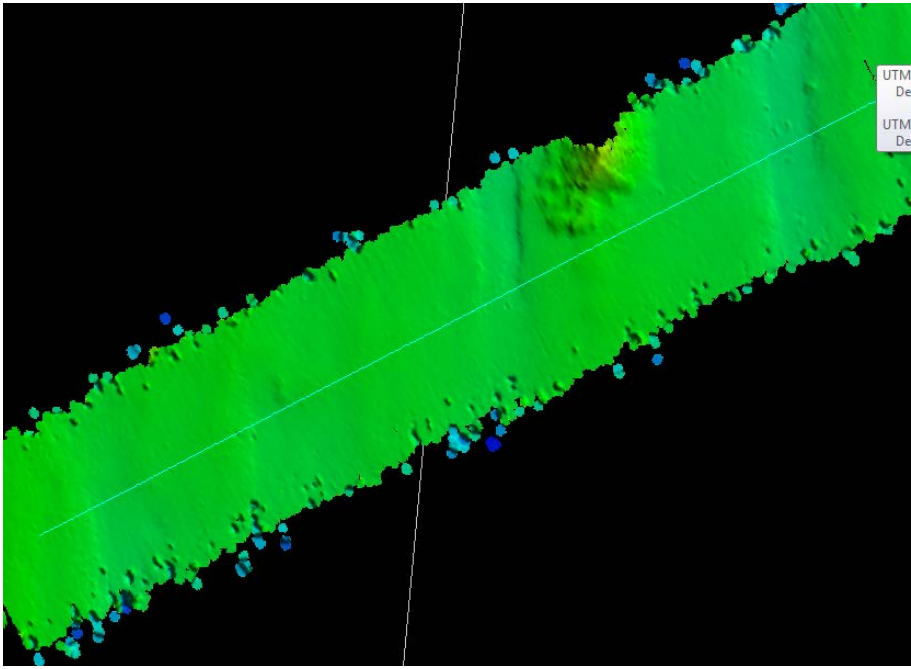

Reasonable multibeam data, slight reduction in swath width.

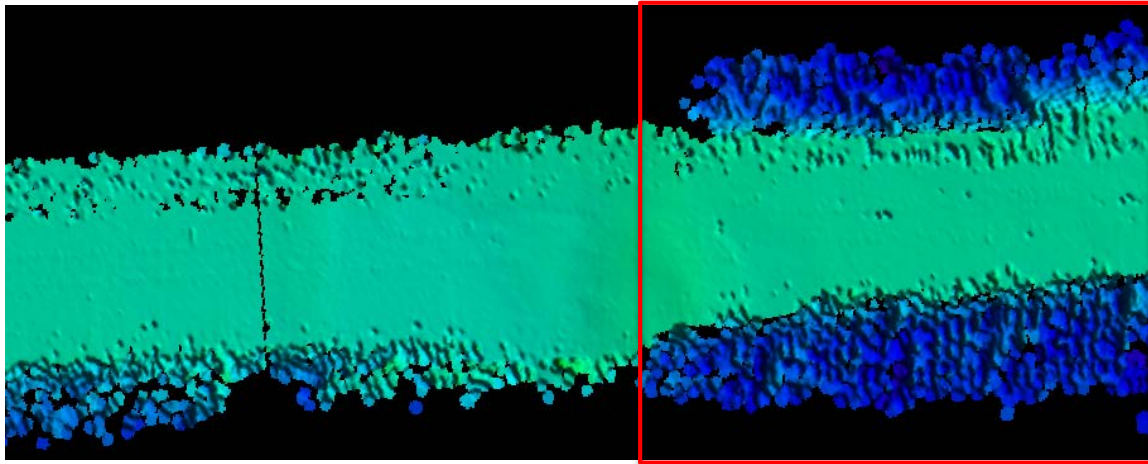## Line 0079 EM302 + OS75 BB (128 bins of 4m)

Unacceptable multibeam data.

Line 0080 EM302 + OS75 NB (60 bins of 16m)

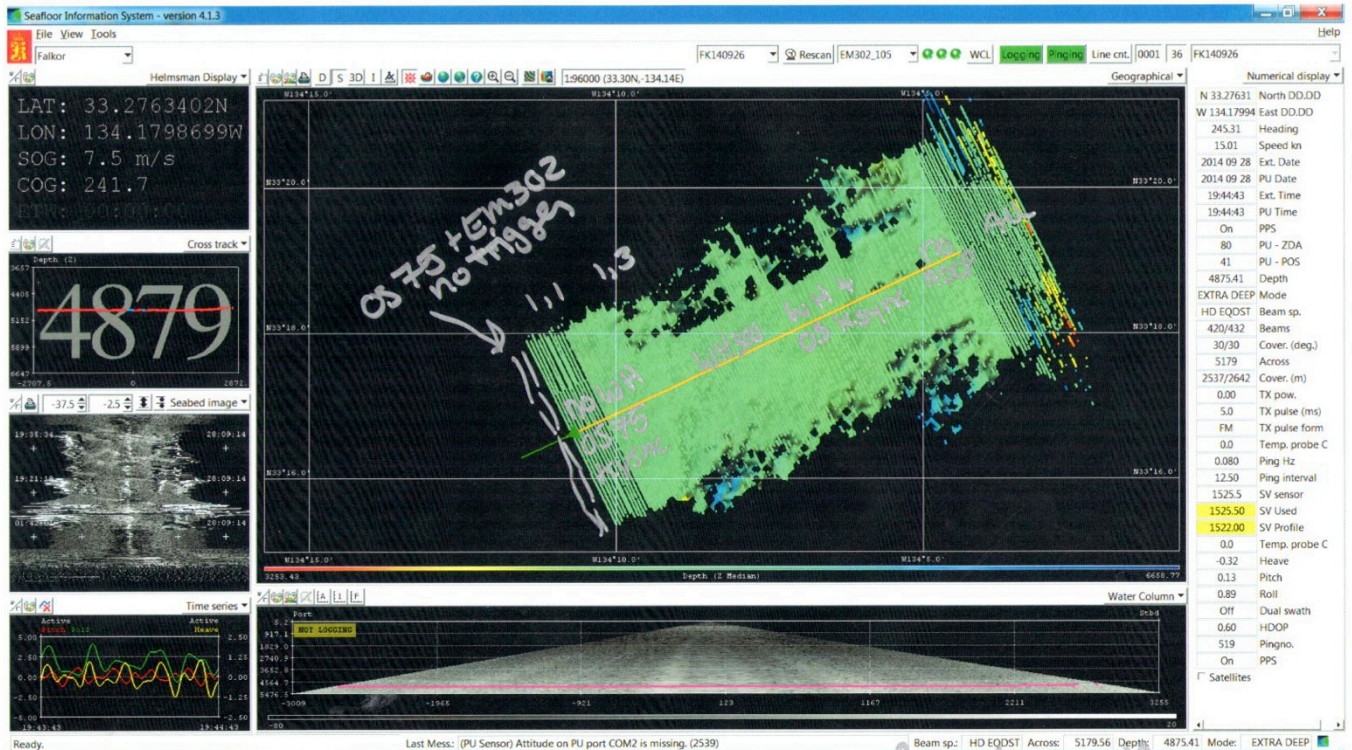Reasonable multibeam data.

EM302 + WH300

Unacceptable multibeam data, significant reduction in swath width when WH300 pinging.

Overview

This test was conducted with the KSYNC.

September 2014,   Paul Duncan and Colleen Peters   R/V FALKOR

Just after departing San Francisco, we turned the systems on to see how they would do in deeper water. With the EM302, OS75 and WH300, there was a tremendous amount of interference in the EM302. You can clearly see the differences when no ADCPs are running in the quality of the multibeam data. When the WH300 is pinging, the multibeam data becomes unacceptable. The swath width is reduces by 1/3rd. This may be largely due to the ADCP's being installed (too?) close to the EM302 Rx array. It is not possible to run the WH300 in these depths while trying to collect quality EM302 data. It is, however, not a problem in shallower depths, as seen on the FK140922 seatrials, where we were in 500-1000m water depth, running both systems continuously. When the EM302 and OS75 are synchronized with KSYNC, that is when we have the best quality EM302 data. However, now the problem shifts to the OS75, which then has a reduction of data quality. The OS75 sees a reduction in ping quality at 200m when the EM302 is triggered. This is not acceptable from the ADCP quality perspective.
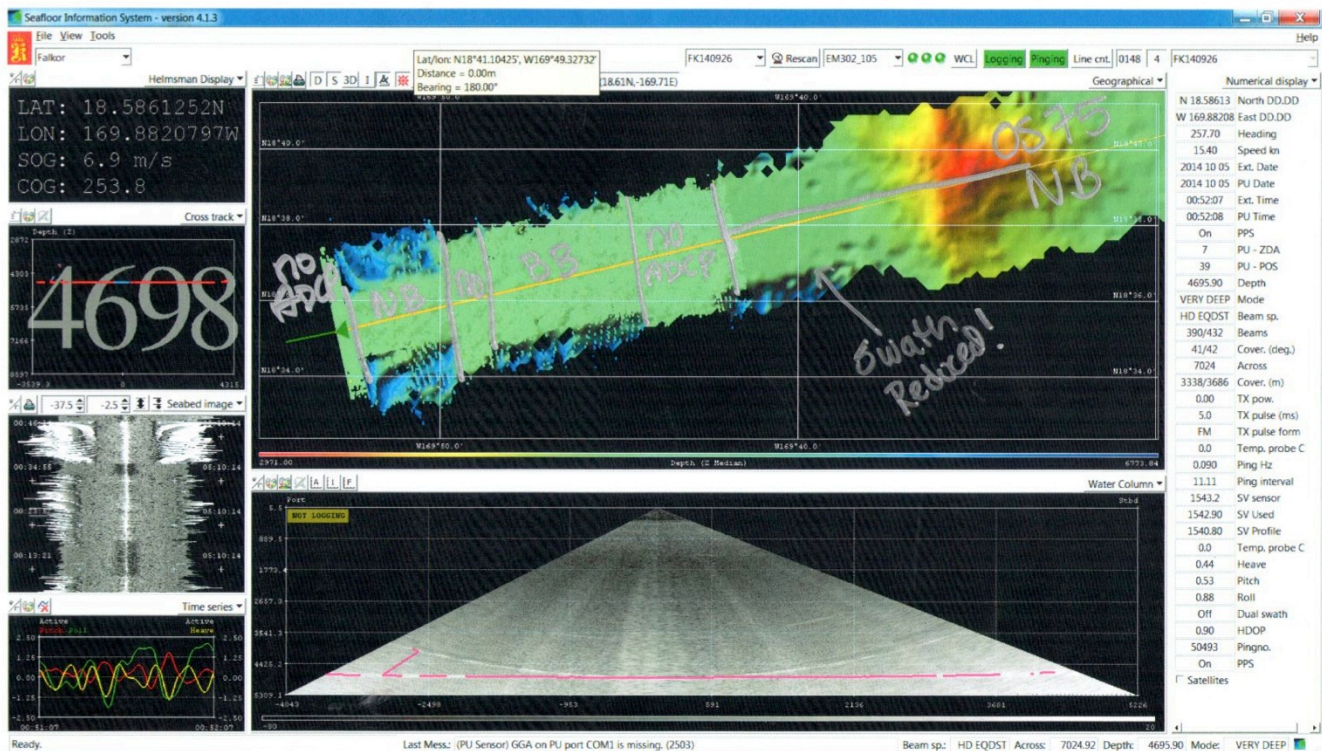
When the ship crossed a seafloor feature, when coming down the other side, the EM302 switches ping modes, as the depth changes. The sonar would have changed from "Deep" to "Very Deep" ping mode. While the OS75 and EM302 were previously "happy", they got out of 'sync' (not being triggered, just playing nicely together) and it caused a loss of swath width. Once restarted, by turning the ADCP off and on again, we were unable to obtain the good quality data we had seen before the seafloor feature. This would be difficult to manage when on a transit and not running mapping watches.