IS06/04 MeBo Cruise – Summary Report

Vessel: RV Celtic Explorer (Marine Institute)
ISPSG Rep of board: Barbara Murray (PAD)
Operations Support: Michael Hanrahan (PAD)
MeBo Operations: Tim Freudenthal (Marum)

Mobilisation of MeBo equipment and installation – 13th July

Departure Galway – 15th July

1. *SITE Bii* [Please note there 3 deployments on this site – see details below]

Site 25/7-sb(MeBo)1 / GeoB10909-1 – on site afternoon 16th July, carried out multibeam survey; test deployment of system to check telemetry (unable to do full test in Galway harbour); conducted push core to 115cm below seabed; commenced rotary coring to 265cm below seabed. The following samples were described:

GeoB10909-1 25/7-sb(MeBo)1
1P-1 - Medium/coarse sand with shells and rock fragments. 0-55 cm

GeoB10909-1
1P-CC - Gravel found in the core catcher (from 1 m depth below sea floor)

GeoB10909-1
Granite and mud samples found in the barrel magazine (at 0-250 cm below sea floor).

Sample taken from magazine barrel ~0-250 cm below sea floor. Sample consists of granite samples <2cm diameter and small amount of mud.

Gravel recovered from core catcher, sample is from 1m depth.

Move to ***site 25/7-sb(MeBo)2 / GeoB10909-2*** 18th July – based on multibeam this is highest part of seabed feature – 53.678188 -13.728736. WD 251m.
19th July – push cored to 4m through sediments with lots of gravel, switch to rotary coring. Stopped drilling after collapse of drill hole (gravel). The following samples were described:

GeoB10901-2
1R-1
Granite gravel <3 cm diameter angular pieces
13cm of samples – in a 32 cm liner of rock, possible matrix around these rocks may have been washed out, as core catcher would not have collected this.

GeoB10901-2
2P-1 *
58 cm push core
Top 25 cm Marine sediments – medium grained grey sand
Lower 33 cm Granitic sediment coarse grained angular sediments

GeoB10901-2
3R-1 *
Granite angular pieces ranging in size from 8 - 1 cm diameter, again, matrix may have been washed out as would not have been stopped by core catcher. ~ 30 cm of core.

GeoB10901-2
4R-1 *
Granite angular pieces ranging in size from 8 - 1 cm diameter, again, matrix may have been washed out as would not have been stopped by core catcher. 15 cm of samples- in a 40 cm container.

**** when the first core barrel (1R-1) was removed from the hole the following core barrels may contain samples from the upper 3 m surrounding the hole. This may have fallen back into the hole after 1R-1 was removed.***

GeoB10901-2
Drill bit sample
1 granite sub angular sample, 4 cm diameter.
1 metamorphic rounded sample, 6 cm diameter.

GeoB10901-2
1R-CC
Small 1.5 cm diameter, rounded granite pieces from core catcher of 3rd barrel.

GeoB10901-2
3R-CC
Large 5 cm diameter, granite, sub-angular pieces.

Further multibeam survey for more suitable areas. Move to ***site 25/7-sb(MeBo)3 /GeoB10909-3*** 19th July – very hard drilling to 1.5m – pulled MeBo, diamond corehead very worn. Recovered 1.2m core of pegmatitic granitic with large round feldspars.

2. SITE L [There were 2 deployments at this site]

Move to next ***site 25/27-sb(MeBo)1 /GeoB10903-1*** 20th July –carry out multibeam survey. Problems with core barrels.

site 25/27-sb(MeBo)2 /GeoB10903-2 21st July – same location – new launch - start drilling with hard metal bit. Cored to 8m when deteriorating weather forced recovery of MeBo. No recovery from "hard metal" coring. Gravel recovered from syn set barrel and circa 1.7m of core recovered from surface set barrel – gneisses, meta-pelites and conglomerates

3. SITE X

Move to next ***site 74/26-sb(MeBo)1 /GeoB10904-1*** Wait on weather. 22nd July – do multibeam survey. Launch MeBo during break in weather – damage to equipment due to rough weather – recovered MeBo without drilling. As MeBo needs repair return to earlier shallow water site (site L) whilst repairing MeBo.

Site 25/27-sb(MeBo)3 /GeoB10905-1 24th July – launch MeBo, core to 3m. Recover MeBo – no core recovery – pump damaged.

26th July – return to Galway to demob.

4. SUMMARY OF RESULTS:

A good sample of granite has been recovered from Site 25/7-sb(MeBo)3 (Site Bii) which we are confident is in situ. The sample of gneiss recovered from site 25/27-sb(MeBo)2 /GeoB10903-2 (Site L) is more problematic but may well be in situ. If this is the case we will have succeeded in recovering core from 2 out of the 3 high priority drill sites on the Porcupine Bank.

One of the problems encountered was the gravelly nature of the seabed that had not been anticipated. The INSS multibeam data had been closely reviewed to try and avoid this type of substrate.

Considerable experience has been gained by the MeBo team in operating in the deeper waters and hasher weather environment offshore west of Ireland. The Marine Institute has now established the RV Celtic Explorer as an excellent platform and a good operating relationship with Marum that provides a new deep sea coring tool for future European research.

Another cruise with MeBo using the RV Celtic Explorer is currently being planned by the CMRC at UCC. We may well be able to avail of time on this cruise to obtain a sample from the third high priority site. Members will be fully informed about this at the next Management Committee meeting.