Week 3 Drilling and Scientific Report for IODP Expedition 313
New Jersey Shallow Shelf

21st May – 27th May 2009

1. Operations

During the early hours of 21st May, the wireline logging programme for the middle section of the hole was completed successfully, and at dawn preparations were made to begin VSP operations. The VSP work continued throughout the day until about 1800 hrs. Once the openhole section had been logged, VSP data acquisition continued inside the pipe up to the base of the casing. Marine mammal observers began watch 30 minutes before the airguns started firing and finished 30 minutes after the airguns were switched off. In the evening preparations were made to pull the pipe up to the top of the next openhole logging section. However, a fault developed with the drilling rig motor before pipe pulling commenced. This required a spare part not available on the platform. Efforts to effect a temporary repair on board to keep the system operational for the remainder of the logging programme were attempted, but unsuccessful. Late in the evening operations had ceased while waiting for the part (and additional spare) to be delivered by supply boat.

The supply boat arrived with the spares at about 0800 hrs on 22nd May and the rig was operational by 0830 hrs. Two double stands were tripped with the aim of opening the hole to 97 mbsf. However, the pipe became stuck, and despite applying 5 times the usual torque, the pipe would not rotate in the hole, and could not be pulled further. The decision was taken to abandon Hole MAT-1A and move to MAT-2D to begin operations. The pipe was cut just above the core barrel and tripped. The casing was retrieved and the deck, drilling rig and containers secured for the rig move.

The Kayd arrived at Mat-2D just after midnight on 23rd May and began jacking-up on site. This process was completed by 1100 hrs, and the deck prepared for drilling operations. The casing plan for MAT-2D was to run casing as deep in the hole as possible. The casing operation began after midday and continued overnight. Progress was very slow due to the ground conditions. Just before 0600 hrs on 24th May, the casing twisted off at the crossover sub 1-2m above the sea bed. ROV inspection confirmed that casing was protruding from the sea bed and lengths of casing pipe were lying on the sea bed.

After this setback, the hole was restarted at the same location. The new casing string was prepared and run into the sea bed and rather than case to great depth, it was decided to openhole using the PQ string to the target depth of 215m and then continuously core the middle and lower sections of the hole to 750m, as this was the primary objective. By the end of 24th May, 80m had been drilled.

Overnight the drill pipe got stuck at a depth of 102m. The jam was cleared by 0830 hrs and openhole drilling resumed, reaching a depth of about 157m at 1450 hrs. Drilling stopped at this point to lower the casing further into the sea bed and then restarted. Just before 1800 hrs a clay formation was encountered at a depth of 178m. The core barrel was inserted, but the drill pipe was sticking, so the base of the borehole was reamed out. This proved unsuccessful. Sticking points had been noted further up the hole also (probably swelling clays), so a much more substantial reaming operation began in order to condition the hole before the start of continuous coring operations. The pipe was tripped back 98m and a mud mix that would help to inhibit the swelling clays was pumped into the hole.

By late evening on 25th May the pipe was being lowered back down the hole and the reaming operation continued overnight and most of the following morning. The hole was deepened to 218m by 1230 hrs on 26th May and coring began. Back pressure was encountered during coring on this and the next run. After that, the back pressure diminished. A zone of high back pressure was encountered in MAT-1 at a similar depth interval also. Coring and reaming continued until midnight with core recovery of 100% or greater on all runs, by which time the TD was 246m. Overnight the core recovery was more variable as sandy formations were encountered and there problems with the drill pipe sticking which required more hole conditioning. At 0820 hrs on 26th May at a TD of 264m the core barrel did not latch in on lower down the hole. It could not be pulled back either as it was jammed and there was no flush. The only solution was to trip the pipe and recover the barrel. The pipe was tripped by 1330 hrs. The bottom of the BHA was blocked with sand. As the drill pipe had been tripped this was an opportunity to try to deepen the casing beneath the sea bed to improve its stability. The casing operation continued until midnight.

2. Hole summary

The start of the week saw the completion of wireline and VSP logging at MAT-1A.

Hole	M0028A
Latitude	39° 33.94279' N
Longitude	73° 29.83481' W
First core	26/05/09 at 15:15
Last core	
Cores recovered	1R to 16R (16 cores)
Drilled length	45.75 m
Recovered length	38.52 m
Core recovery	84.20 %
Final depth	264.03 mbsf so far
Hole recovery	84.20 % so far

3. Science

This week, we ended the logging operations at MAT-1A (May, 21st) and started drilling at MAT-2D (May 26th), with an intermediate time of transit, pre-loading of the platform and preparation of the hole for drilling.

On the last day of logging at MAT-1A, we ran, in open hole conditions, Spectral Gamma Ray, Sonic and Acoustic imagery above a bridge that had formed in the middle section at 347 mbsf. We then acquired VSP (Vertical Seismic Profile) data in the same section and continued through the pipe in the upper section. After logging the middle section, we could not pull up the pipe to log the upper section in open hole condition. This was the end of the logging operation and of the scientific data acquisition at MAT-1A. Although some open hole logs are missing in the upper section, the dataset gathered at MAT-1A is considerable and of great quality. The raw data of the documented section look very promising. They will help to tie the core to the hole, the hole to the seismic data and to refine lithologic boundaries, porosity, the density, the sand/clay ratio etc.

The coring started at MAT-2D after 221m of drilling without coring to reach the top of the huge set of clinoforms bodies of the Miocene New Jersey margin. The first core was on deck at 1630 on the 26th with excellent recovery of stiff, massive, light grey, micaceous clay with wood fragments, lignite, pyrite, bivalves and forams. Early in the night, there were subtle changes in the lithology to sticky, tan clay with forams and then olive-grey sandy clays with shell debris. This would indicate that we probably crossed through the first mid Miocene unconformities m4.6 and m4.8 at the top of the clinoforms. With continuous coring, we went through 10m of sticky, olive-grey silty clay, slightly micaceous, with rare lignite and shell fragments. At 253m, we entered into a poorly sorted, angular to sub-rounded, medium to coarse grained quartz sand with glauconite sand and granules and rare shell debris. Recovery decreased sharply, with the sands being recovered being very liquefied within the core liner. The core barrel locked at 264m and coring stopped. We probably reached one of the most important unconformities at the top of Miocene prograding clinoforms, the m5 Langhian unconformity, although we probably did not go through it yet.

4. HSE Activities

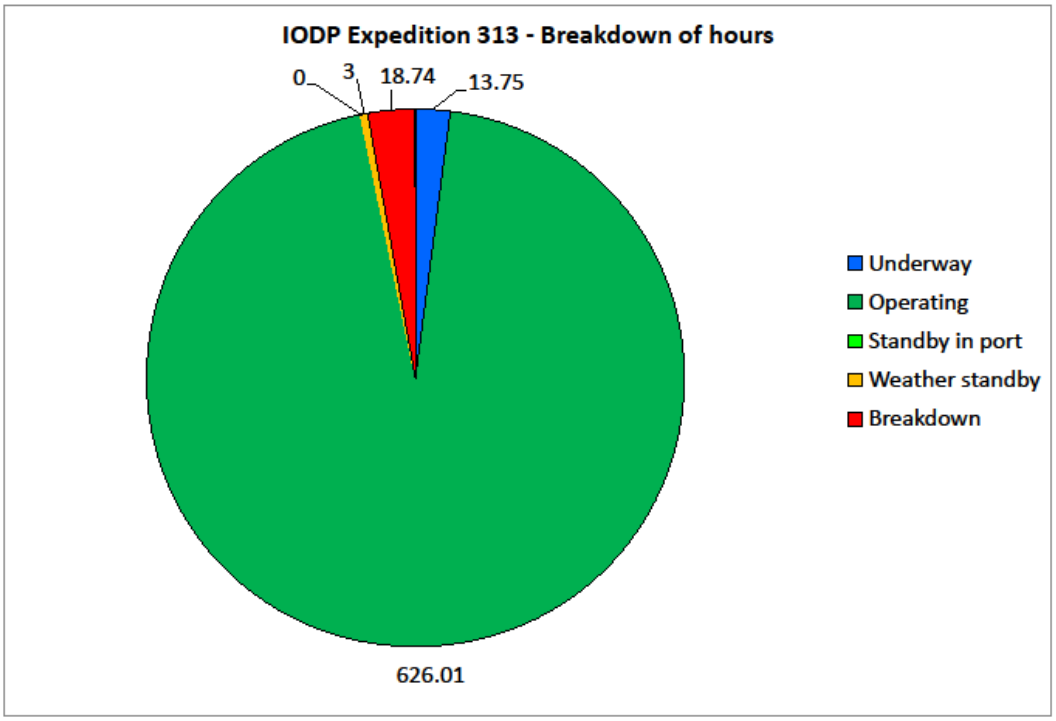
A safety drill was conducted on 21st May at 1800 hrs and again on 27th May, following vessel orientation and health and safety briefings for all new personnel arriving onboard.

VSP logging operations took place on 21st May from shortly after dawn until 1730 hrs. From 30 minutes before operation of the airguns to 30 minutes after the airguns ceased, a continuous mammal watch was maintained. Throughout the day a number of Fin whales were observed continuously in the general vicinity of the platform, but well outside of the exclusion zone (and in the same general location of sightings on previous days). The pattern of activity suggested that they were feeding and appeared to be undisturbed by the airguns.

5. Figures

On next two pages:
Figure 1 – Recovery and depth versus time plot at Hole M0028A, up to 2400 hrs on 20th May.
Please note that due to limited recovery of cores at M0028A MAT-2D by 2400 on 20th May (38.52m), there is no progress plot included in this week's report. A detailed plot will be included in next week's report.

Figure 2 – Breakdown of hours, up to 2400 hrs on 27th May.



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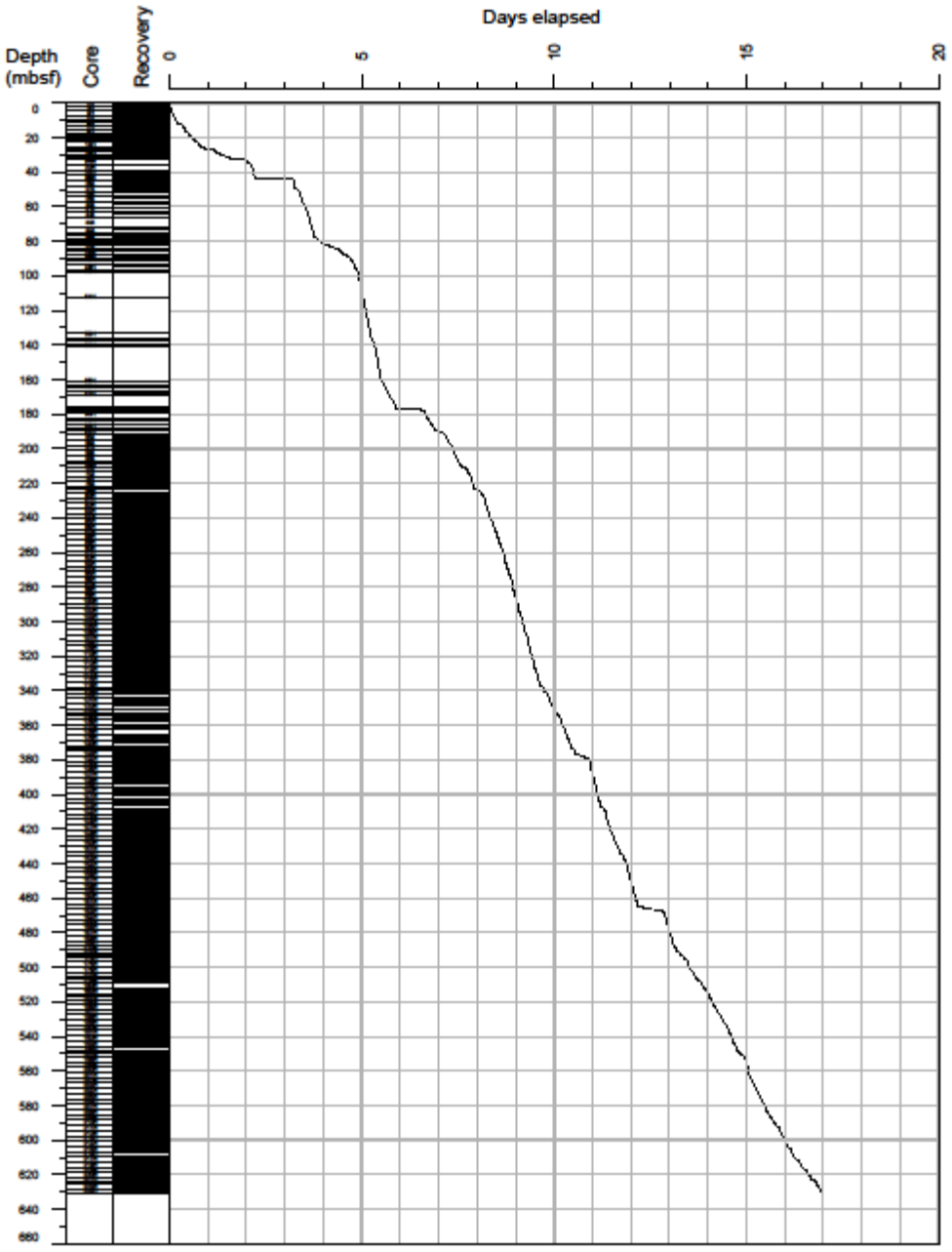
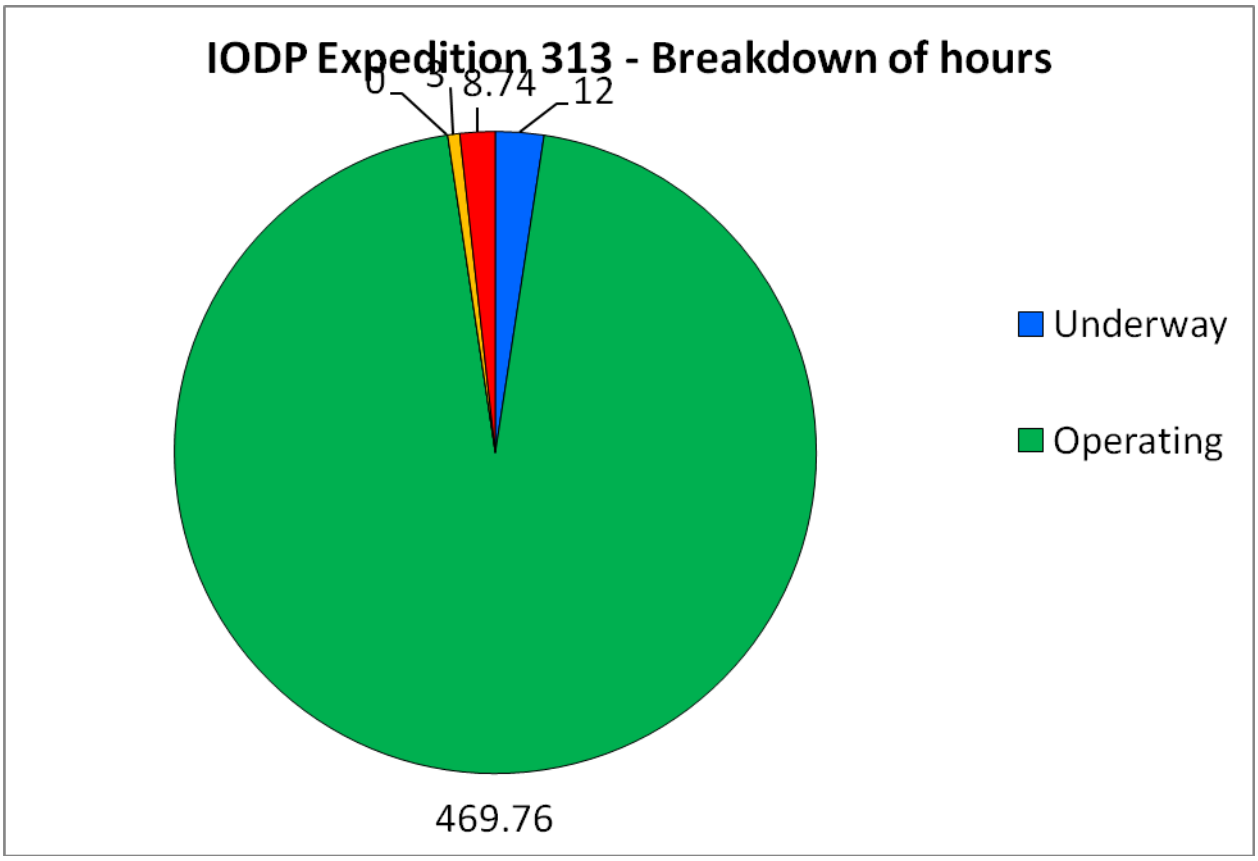
Hole M0027A progress summary

Latitude: 39° 38.04606 N
Longitude: 73° 37.30146' W
Water depth: 33.5 m




IODP Expedition 313 - Breakdown of hours
0
3
8.74
12
469.76
Underway
Operating