**Week 6 Drilling and Scientific Report for IODP Expedition 325**
**Great Barrier Reef Environmental Changes**

**19th March – 25th March 2010**

## 1. Operations

After remaining at anchorage outside Townsville due to cyclone Ului for most of March 19th, the decision was taken to transit northwards towards the Ribbon Reef sites. The vessel arrived on location at Ribbon Reef 3 at 19:30 on the 20th, and began preparations for coring. However, due to a DP problem upon arriving at the Ribbons Reef area, coring activities were delayed 24 hours. Running pipe commenced in the last quarter of the 21st and by midnight the seabed camera survey and the 1st EXN core run had been completed.
A problem with the mud pump valve stopped the hole after the 2nd core run early on March 22nd. The pipe was pulled back above the seabed while the valve seal was repaired. The hole was re-entered and cored with API EXN and ALN core barrels until the Pleistocene had been reached. Excellent cores were recovered using short 1-1.5m core runs. The pipes were then lifted to just above the seabed and the hole viewed with the downhole camera before moving over 4m to the next location. API EXN and ALN core runs were run until 10.5 mbsf, when the hole was completed. The drill string was pulled to just above the seabed and a post hole camera survey performed before the vessel was moved to the next site 78m closer to the reef. After deploying the seabed transponder, a pre hole camera survey confirmed no live coral and by midnight the 1st core run had begun on M0050A.
Coring started on site M0051A on March 23rd, after the decision was taken to end M0050A at 10 mbsf. On spudding in and completing 2 core runs, the hydraulic pump and hence power to the elevator and mud pump value failed, thus ending the hole. The pipes were eventually tripped using a manual elevator and investigations into the pump failure and sourcing a spare began. The GBRMPA ESS arrived at location onboard the Reef Charters "Hurricane" at 13:00 on the 23rd. However, after various failed attempts to get her on board, due to the poor sea state, she returned to Cooktown. The weather was then declared as being unsuitable for coring. After a discussion, the co-chiefs requested the vessel move to Noggin Pass, 108 nautical miles south to wait for the weather to improve. The vessel arrived on location at NOG_01B Site 6 on March 24th at 11:20. By midnight on March 25th, operations were still waiting on weather.

## 2. Hole summary

| **Hole** | M0049A | M0049B | M0050A | M0051A |
|---|---|---|---|---|
| **Latitude** | 15° 28.3425 | 15° 28.3425 | 15° 28.34022 | 15° 28.32825 |
| **Longitude** | 145° 49.42185 | 145° 49.42185 | 145° 49.42181 | 145° 49.38075 |
| **First core** | 21/03/2010 at 23:30 | 22/03/2010 at 04:20 | 22/03/2010 at 17:20 | 23/03/2010 at 01:05 |
| **Cores recovered** | 1X – 2X | 1X – 13R | 1X – 6R | 1R – 2R |
| **Drilled length** | 3.5m | 15.6m | 10.5m | 2.5m |
| **Recovered length** | 0.77m | 2.79m | 1.87m | 0.15m |
| **Core recovery** | 22% | 17.88% | 17.81% | 6% |
| **Depth reached** | 3.5 mbsf | 15.6 mbsf | 10.5 mbsf | 2.5 mbsf |

## 3. Science summary

| Hole | Core | Sediment Description | Comments |
|---|---|---|---|
| M0049A | 1X & 2X | Algal crust with carbonate sand and gravels containing benthic forams and Halimeda | |
| Technical problem meant the drill string had to be tripped | | | |
| M0049B | 1X & 2X | Broken fragments of coralgal bindstones, light brown mudstones (microbialite?) and Halimeda floatstones. Thin (2-3mm) encusting foliaceous corals observed (*Leptoseris* sp?) | Indicating deep lower energy depositional setting |
| | 3X | Similar to above but with more broken coral fragments | |
| | 4R | Coral framestone (massive Porites) | Likely in-situ |
| | 5R & 6R | Broken coral framestone (Lobophyllia, Porites) with attached light brown mudstone (microbialite?) | |
| | 7R | No recovery | Drillers log suggest cavities / sand |
| | 8R | Broken coral framestone (i.e. Porites), gravels and sands. Core catcher contained massive *Acropora palifera/cuneata* | Likely in-situ |
| | 9R | Coral framestone dominated by massive *Acropora*, coralline algal crusts, light brown mudstone and Halimeda sediments | |

| | | | |
|---|---|---|---|
| | 10R | Continuous sequence of coral framestone | 92% recovery |
| | 11R | Coral framestone with some cavities and brownish staining | Dissolution features visible |
| | 12R | Coral farmestone. Other features include fillings, cements and dissolutions | Vadose diagenesis? |
| | 13R | No recovery. Hole terminated | |
| M0050A | 1X & 2R | Lime sediments | |
| | 3R & 4R | Framestone with dissolution features, and a thick microbialite | |
| | 5R & 6R | Framestone that appeared to have undergone alteration | |
| M0051A | 1R & 2R | Coralline algal dominated nodules (rhodolith) | |

**4. HSE Activities / Environmental**

The small boat *Hurricane* arrived at the *Greatship Maya's* location at 13:00 on March 23rd carrying the GBRMPA ESS Jessica Hoey. Two attempts were made to conduct a boat to boat transfer, however weather conditions had deteriorated to such an extent that it was not safe to complete this operation. The ESS therefore returned back to Cooktown on the Reef Charters *Hurricane*.

A muster fire alarm drill was conducted at 11:00 on March 24th for all crew, ESO and science party personnel onboard.

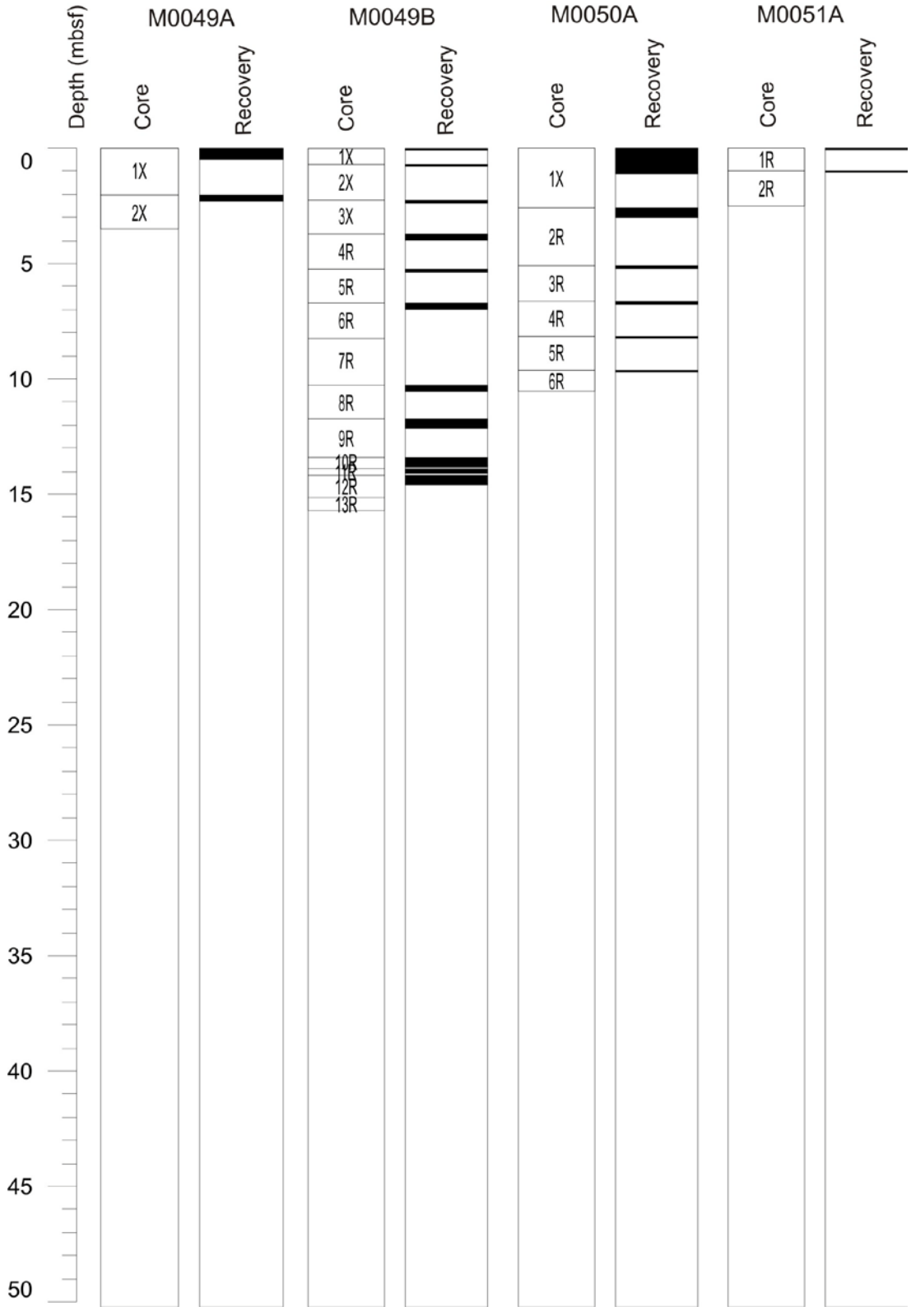
**5. Figures**

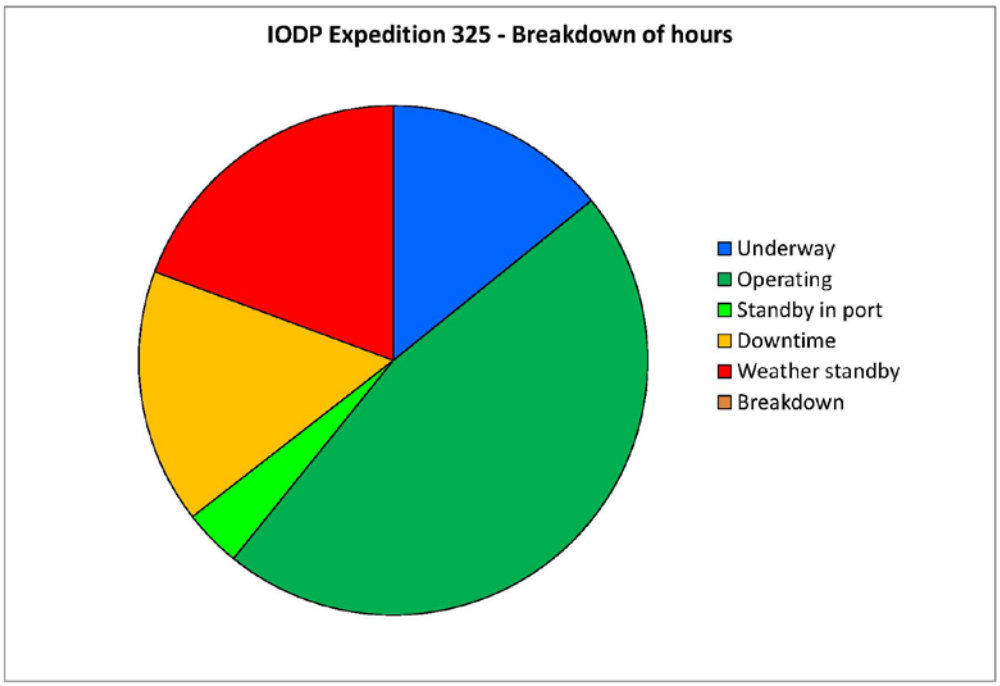
On next two pages:

**Figure 1** – Recovery and depth plot for Holes M0049A – M0051A

**Figure 2** – Breakdown of hours up to 2400 hrs on 25th March. No contractual implications can be made from this summary.

# Expedition 325
# Week 6
# RIB 02A Sites 3 & 4






Note on Figure 2. The diagram above includes an estimated “downtime” of 14 hours, “standby in port” of 13.5 hours, “underway” of 45.75 hours and “weather standby” on a named cyclone of 149 hours that occurred off contract.