Daily Drilling and Scientific Report for IODP Expedition 325, Great Barrier Reef Environmental Change

11th March 2010 (0000 - 2400 local time)

1. Location

HYD_02A Site 8 (M0045A&46A) and Site 12 (M0047A).

Time zone: Brisbane Australia Time, UTC +10

Position at midnight (drill string):
Latitude: 19° 47.98513 S
Longitude: 150° 28.73131 E

2. Activity summary

M0046A was cored to a depth of 31.2m, despite slippage at the top of the hole, most likely due to the sea bed topography. Following completion of this hole the vessel moved to M0047A where a camera survey took place and coring operations commenced.

3. Science report

Core 1R advanced to 6.27mbsf but the barrel dropped rapidly and recovered only broken coral fragments, recent bindstones (deep water crust?) and sediments. Core 2R recovered similar deep water bindstones. The drill bit appeared to be skidding or skipping across a steeply sloping limestone surface rather than securely spudding in. Core 3R advanced 12mbsf but this time recovered a 6cm cored massive Faviid coral in the core catcher, along with other broken corals (*Acropora, Porites*) with internal grainstone-rudstone sediments. The cored lithologies and the driller's logs indicated that the drill bit actually penetrated below sea bed with the equivalent of ~ 10.8 m of pipe "below" the sea floor. This placed the revised top of hole and sea floor at ~ 116 m (to be confirmed). Core 4R continued to 15mbsf and recovered numerous cored sections of massive Favidae corals. Core 5R advanced another metre and recovered coral framestones composed of numerous massive corals (Porites?), along with unlithified carbonate sediments (Halimeda). Core 6R recovered broken fragments of coralline algal bindstones in a matrix of unlithified carbonate sediments, dominated by Halimeda flakes and broken coral fragments. Core 7R recovered broken massive coral fragments and carbonate sediments, while Core 8R had no recovery. Core 9R advanced to 23.2mbsf and cored several sections of framestone composed of massive corals (Faviid, Porites) encrusted by thick crusts of coralline algae with vermitids and abundant microbialite coatings. In Core 10R only carbonate

gravels, coral rubble (nine different genera) and broken corals were recovered, advancing to 25.2mbsf. Cores 11R-13R advanced to 31.2mbsf and recovered similar coral rubble (e.g., *Pocillopora, Seriatopora, Porites, Acropora,* Favids) and gravel deposits materials. This indicates a possible change from framestones deposits to rubbles and gravels below about 23.2mbsf.

Core 1R (M0047A) had no recovery, but Core 2R consisted of algal crusts, coralline algae and bryozoan. The top of the core captured in situ algal crust coated by coralline algae and tubeworms. Therefore this might indicate the start of coring although Core 1R seemed to have been in heave compensation according to the driller. Core 3R was composed of bioclast rubble. Core 4R recovered some fragments of Faviid and branching corals. Fragments of coral framestone were recovered in Core 5R, with stained reddish grainstone. Coral framestone continued (but still with poor recovery) in Cores 6R and 7R. Core 8R section 1 consisted of sandy sediments with small pebbles, yet the core catcher contained many benthic foraminifers and massive *Acropora* sp. Broken coral framestone continued in Core 9R, and many branching coral fragments were observed. Poor recovery continued through Cores 10R to 13R. Sand with fragments of coral framestone continued to appear in these intervals, down to 31.7mbsf. Branching corals as well as Faviid were recovered in the core catchers.

4. Core recovery details

Hole	M0046A	M0047A
LAT water depth	106.41m	99m
Cores recovered	13	13
Drilled length	31.2m	31.7m
Recovered length	2.78m	3.48m
Recovery	8.63%	10.98%
Depth at midnight	32.3mbsf (final depth)	31.7mbsf

5. Weather

Sea state: moderate (4) becoming rough (5) with swell of > 2.5 m; wind direction ESE becoming SE force 6 increasing force 6/7 (28-33 knots) by evening; partly cloudy becoming overcast; 28°C.

Next 24 hrs: Sea state moderate to rough with swell of 2.5 – 3.5 m in open waters; wind direction SE 25 - 35; scattered squally showers.