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

22nd March 2010 (0000-2400, local time)

1. Location

RIB_02A Hole 3 (M0051A)

Time zone: Brisbane Australia Time, UTC +10

Position at midnight (Ribbon Reef 3):
Latitude: 15° 28.32825 S
Longitude: 145° 49.38075 E

2. Activity summary

Coring operations began at site RIB_02A Hole 4, and continued through until 21:50 when the vessel was prepared for, and moved onto, RIB_02A Site 3. By midnight, the pre-coring camera survey was in progress at Site 3 (M0051A).

3. Science report

Core 2X of M0049A advanced to 3.5 mbsf and recovered similar material to that in Core 1X, namely sand and gravels with benthic forams and Halimeda. Due to a technical problem, the string had to be tripped. Hole M0049B began in the same location.

Cores 1X and 2X advanced to 2.2 mbsf and recovered broken fragments of coralgal bindstones, light brown mudstones (microbialite?) and Halimeda floatstones. Very thin (2-3 mm) encrusting to foliacous corals (*Leptoseris* sp?) were observed, indicating a deep, lower energy depositional setting. Core 3X recovered similar lithologies but contained more broken coral fragments in the core catcher. Core 4R advanced to 5.2 mbsf and recovered a 28 cm section of coral framestone (massive Porites), likely cored insitu. Cores 5R-6R continued to 8.2 mbsf and recovered broken coral framestones (Lobophyllia, Porites) with attached pieces of light brown mudstones (microbialite?). Core 7R had no recovery and combined with the drillers logs (drill bit dropped rapidly) indicated a 2 m interval of sand and/or cavities. Core 8R advanced to 11.7 mbsf and recovered broken coral framestones (ie. Porites) gravels and sands. The core catcher contained a 5 cm cored massive *Acropora palifera/cuneata* likely insitu. Core 9R recovered about 40 cm of coral framestones dominated by massive *Acropora*, coralline algal crusts, light brown mudstone and Halimeda sediments. Core 10R advance to 13.8 mbsf and achieved 92% recovery with continuous sequences of coral framestones. Core 11R consisted of coral framestone with some cavities and brownish staining. Dissolution features were visible. Core 12R advanced to 15.1 mbsf,

also recovering coral framestone. There were signs of aged materials including fillings, cements and dissolutions. Some of the features were attributed to vadose diagenesis. Core 13R did not recover any materials and the hole was abandoned.

Cores 1X and 2R (M0050A) contained lime sediments. Cores 3R and 4R contained framestone with dissolution features. A thick microbialite was also recovered. Framestone that appeared to have undergone alteration was recovered in Cores 5R and 6R. Overall, poor recovery made it difficult to interpret the stratigraphy. The decision was taken to abandon the hole.

4. Core recovery details

Hole	M0049A	M0049B	M0050A
LAT water depth	97.48m	97.48m	97.48m
Cores recovered	2X	1X – 13R	1X – 6R
Drilled length	1.5m	15.6m	10.5m
Recovered length	0.27m	2.79m	1.87m
Recovery	18%	17.88%	17.81%
Depth at midnight	3.5mbsf (final depth)	15.6mbsf (final depth)	105mbsf (final depth)

5. Weather

Sea state: moderate (4) becoming slight (3) with a swell of <1.25m; wind direction ENE becoming SE force 3 (7-10 knots) increasing to force 6 (22 – 27 knots) by midnight; partly cloudy becoming overcast by mid morning with scattered showers; 28°C.

Next 24 hrs: Sea state moderate with swell of 1.7 – 2.2 m in open waters, increasing to 3 m during the afternoon; wind direction SE 20 – 25 knots increasing to 20 – 30 knots in the afternoon; scattered showers.