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

28th March 2010 (0000-2400, local time)

1. Location

NOG_01B Site 6

Time zone: Brisbane Australia Time, UTC +10

Position at midnight (on station M0053A):
Latitude: 17° 06.07036 S
Longitude: 146° 34.57966 E

2. Activity summary

Commenced coring operations at M0053A, which continued throughout the day.

3. Science report

Core 1R advanced to 1.5 mbsf and recovered about 1.3 m of grey carbonate sands, gravels and pebbles. The gravel and pebble sized fragments are comprised of broken corals and coralline algal bindstones. Core 2R recovered only a few cm of carbonate sediments in the core catcher, composed of benthic forams, molluscs, halimeda and orange grains. Cores 3R to 4R advanced to 5.3 mbsf and recovered broken coral framestones (massive Acropora palifera/cuneata, Favids) with fragments of coralline algal bindstones. Cores 5R, 6R and 7R advanced to 8.3 mbsf and recovered several well cored sequences of coralgal framestones composed of massive *Acropora palifera/cuneata* and Favids and branching Acropora and Pocillipora, with thick cm scale crusts of coralline algae containing abundant vermetid gastropods. The lithologies are consistent with shallow water, high energy reef environments. Cores 8R-11R continued until 12.6 mbsf and also recovered sequences of coralgal framestones composed of corals (massive and tabular *Acropora*?), with thick crusts of coralline algae containing vermetid gastropods. Light brown, lithified sediments (microbialite?) were observed forming smooth coatings on the upper surfaces of some tabular Acropora colonies. Core 12R advanced to 13.6 mbsf and recovered coralgal and microbialite framestones.

Core 13R also consisted of coral framestone with microbialite. Coral framestone continued in Core 14R even though the recovery was poor, in which thick microbialite with corals (Favid) were distinct features. Cores 15R and 16R contained coral framestone and the core catcher captured microbialite and tubipora. Cores 17R and 18R were composed of framestone

with few corals. Cores 19R and 20R advanced to 21.6 mbsf, and consisted of framestone with almost all the framework containing microbialite. Core 21R reached to 22.6 mbsf and contained a piece ca. 5cm of Favid with microbialite framestone. Framestone continued in Core 22R, but the lower part of section 1 seemed to be predominantly rubble. Core 23R contained framestone and only recovered 7 cm. Core 24R was also only 7cm. But the sediments that were recovered were all angular, suggesting that they were “crushed” during the coring process. The core catcher of Core 25R captured Acropora (?) coral, whilst section 1 consisted of “freshly broken” sand including Halimeda. Core 26X used with the EXN and grainstone was recovered! Most of Core 27R was lime sand although the top part of the section contained grainstones which might be the same continuous sequence of the ones in the previous core. Core 28R had poor recovery. The core catcher contained a piece of coralline algae. It was suspected that because the sand layer had continued, most of the sediments were washed away due to lack of solid rock acting as a “cap” for the core..

4. Core recovery details

Hole	M0053A
LAT water depth	97.0m
Cores recovered	1X – 28R
Drilled length	29.6m
Recovered length	10.51m
Recovery	35.51%
Depth at midnight	30.6mbsf

5. Weather

Sea state: rough (5) with a swell of 2.5 – 4m; wind direction ESE becoming SE by early morning force 6 (22 – 27 knots) decreasing to force 5 (17 – 21 knots) by the evening; overcast with periods of heavy rain; 30°C.

Next 24 hrs: Sea state moderate with swell of 1.7 m in open waters; wind direction E/SE 15 – 20 knots; scattered showers.