

**Week 2 Drilling and Scientific Report for IODP Expedition 325
Great Barrier Reef Environmental Changes**



19th February – 25th February 2010

1. Operations

Feb 19th saw coring continue on M0034A. The decision was made to complete API coring and continue with HQ. The first HQ core was recovered at 11:50. However, at 15:25, the HQ drill string twisted off, and a recovery operation using the Bowen Spear began. This continued until 03:45 on the 20th when the HQ was stabbed, and tripping of the HQ began. By 07:45, reaming of the hole had begun, with a view to continuing coring with API. Poor recovery and excessive mud pressures were noted.

Operations were stopped, and the hole abandoned after a GPS drop-out at 15:18 caused the vessel to move 23m off station. All API pipes were tripped, of which three were bent. GPS positioning was lost again at 20:00 for 10 minutes. Operations were halted by the Master of the vessel until a secondary positioning system could be put in place, and the problems with the primary GPS positioning system found and rectified. The vessel went on standby awaiting instructions from the shore.

On Feb 21st, 3 power outages occurred during the early hours of the morning, due to spikes in demand from the thrusters. Whilst investigations into this new problem continued, permission was sought from, and granted by, GBRMPA to use the seabed frame with an attached HiPap beacon as a secondary positioning system. Following a fault simulation and resulting blackout at 22:04, and corrective measures being put in place, the Master gave permission for operations to re-start, and the vessel moved onto site M0035A at 23:45.

Preparations for coring continued on Feb 22nd with the opening of the moon pool door, deployment of the seabed frame, running of API pipe and camera survey. However, on commencing coring, it was found that the seabed frame was resting at a 14 degree angle, and that the core barrel was outside of the frame. The API pipe was tripped and the seabed frame recovered. At 14:45, the API pipe had been run in again to just above the seabed, and the down hole camera deployed, when a GPS drop-out caused the vessel to lose station. The camera was recovered on deck and discussions began about the safety issues related to coring whilst there was an intermittent positioning problem with all the GPS systems onboard.

At 20:00, the ESO Operations Superintendent was informed that Bluestone and GC Rieber were sending two Veripos engineers (GPS system) and one ConverTeam engineer (DP) from Singapore to Townsville. ESO granted permission to come off hire and transit back to Townsville. The API drill string was therefore tripped, and at 22:40 on Feb 22nd, the vessel began the transit back into Townsville. Upon arrival on Feb 23rd at 21:00, personnel from ConverTeam (DP) and Veripos (GPS) joined the vessel to begin investigation into, and remediation of ongoing DP and GPS faults.

The Greatship Maya departed Townsville at 10:20 on Feb 24th, moving offshore to undergo sea trials for the GPS and DP positioning systems. These continued until 23:50, when a tug boat came alongside to deliver drilling consumables and a new seabed frame for the HiPap beacon secondary positioning system. At this time, the ConverTeam engineer and one Veripos engineer disembarked. The other Veripos engineer will sail. At 0020 on Feb 25th the vessel began the transit to HYD_01C (M0034A).

2. Hole summary

| | |
|-------------------------|--------------------|
| Hole | M0034A |
| Latitude | 19° 41.535 S |
| Longitude | 150° 13.815 E |
| First core | 19/02/2010 at 0020 |
| Cores recovered | 1R – 16W |
| Drilled length | 23.1 m |
| Recovered length | 6.71 m |
| Core recovery | 29.05% |
| Depth reached | 23.1 mbsf |

3. Science summary

| Hole | Core | Sediment Description | Comments |
|--------|-----------|---|---|
| M0034A | 1R | 80cm of coral framestone comprised of massive <i>Porites</i> sp. And other broken coral fragments (Faviid) coated by microbialite and coralline algae crusts. | Massive <i>Porites</i> sp. Well preserved and in-situ |
| | 2R | Broken coral framestone fragments | |
| | 3R | No recovery | |
| | 4R | 50cm succession of coral framestones composed of massive corals (<i>Acropora</i> sp.), coralline algal crusts, microbialite and abundant cavities infilled with light grey mud with visible bioclasts (benthic forms). | |
| | 5R and 6R | No recovery | Possibly related to large cavities, inter-layered unlithified sediments within the coral framework? |
| | 7R | Coral, algal-microbialite framestones recovered. <i>Acropora palifera</i> / <i>cuneata</i> observed. | Confirmation of the likely shallow high energy depositional setting |
| | 8R | Framestone with corals, mainly <i>Acropora</i> sp, and thick microbialites (~6cm or more), some of which had stromatritic structures. | First core using the HQ system. |
| | 9R – 12R | Well developed and continuous sequences of framestone and massive corals (<i>Acropora</i> sp; Faviids), thick microbialites and coralline algal crusts. | High quality core |
| | 13R | Broken corals recovered | |
| | 14R | Carbonate gravel composed mainly of <i>Halimeda</i> plates. | Possible termination of the upper coral framestone unit? |
| | 15R | No recovery | |
| | 16W | ~10cm – as for core 14R | No depth drilled, so recovery probably infill |

4. HSE Activities / Environmental

The safety boat was launched and tested on February 24th.

5. Figures

On next two pages:

Figure 1 – Recovery and depth plot at Hole M0034A

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

IODP Expedition 325

Latitude: 19.692254 (M0034A)

Hole: M0034A

Longitude: 150.230254 (M0034A)

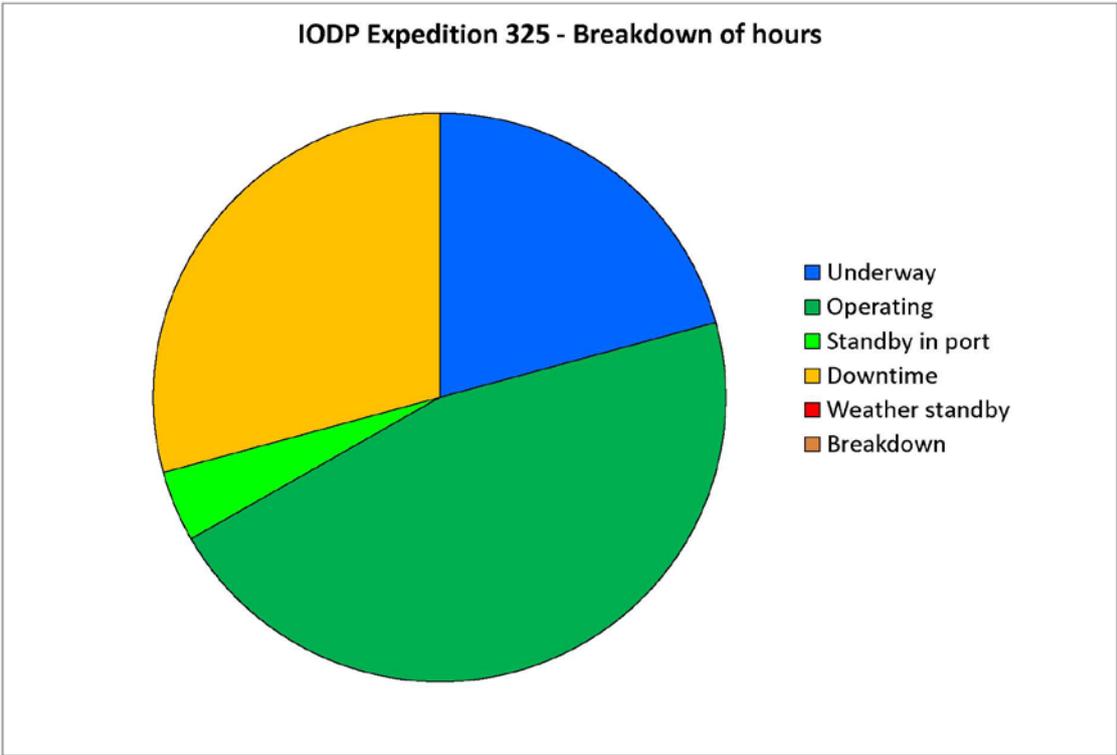
Core Recovery

Water Depth: 55 m (M0034A)

| Depth (mbsf) | Core Number | Recovery |
|--------------|-------------|----------|
|--------------|-------------|----------|

| Depth (mbsf) | Core Number | Recovery |
|--------------|-------------|------------|
| 0 | 1R | ██████████ |
| | 2R | ██████████ |
| | 3R | ██████████ |
| 5 | 4R | ██████████ |
| | 5R | ██████████ |
| | 6R | ██████████ |
| 10 | 7R | ██████████ |
| | 8R | ██████████ |
| | 9R | ██████████ |
| 15 | 10R | ██████████ |
| | 11R | ██████████ |
| | 12R | ██████████ |
| | 13R | ██████████ |
| 20 | 14R | ██████████ |
| | 15R | ██████████ |
| | 16W | ██████████ |
| 25 | | |





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