Pettigrew, T.L., Casey, J.F., Miller, D.J., et al., 1999
Proceedings of the Ocean Drilling Program, Initial Reports Volume 179

2. Site Abstracts[1]

Shipboard Scientific Party[2]

SITE 1104

Hole 1104A

Position: 32°43.3236′S, 57°15.8544′E
Start hole: 1925 hr, 29 April 1998
End hole: 0700 hr, 30 April 1998
Time on hole: 11.58 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 740.0
Distance between rig floor and sea level (m): 11.0
Water depth (drill-pipe measurement from sea level, m): 729.0
Total depth (drill-pipe measurement from rig floor, mbrf): 741.50
Penetration (mbsf): 1.50

Hole 1104B

Position: 32°43.3236′S, 57°15.8544′E
Start hole: 0700 hr, 30 April 1998
End hole: 1630 hr, 30 April 1998
Time on hole: 9.50 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 739.0
Distance between rig floor and sea level (m): 11.0
Water depth (drill-pipe measurement from sea level, m): 728.0
Total depth (drill-pipe measurement from rig floor, mbrf): 741.0
Penetration (mbsf): 2.00

Hole 1104C

Position: 32°43.3236′S, 57°15.8544′E
Start hole: 1630 hr, 30 April 1998
End hole: 0430 hr, 1 May 1998

[1]Examples of how to reference the whole or part of this volume.
[2]Shipboard Scientific Party addresses.

Ms 179IR-102

Time on hole: 12.00 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 739.0
Distance between rig floor and sea level (m): 11.0
Water depth (drill-pipe measurement from sea level, m): 728.0
Total depth (drill-pipe measurement from rig floor, mbrf): 741.0
Penetration (mbsf): 2.00

Hole 1104D

Position: 32°43.3236′S, 57°15.8544′E
Start hole: 0430 hr, 1 May 1998
End hole: 0905 hr, 1 May 1998
Time on hole: 4.58 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 739.0
Distance between rig floor and sea level (m): 11.0
Water depth (drill-pipe measurement from sea level, m): 729.0
Total depth (drill-pipe measurement from rig floor, mbrf): 739.0
Penetration (mbsf): 0

Hole 1104E

Position: 32°43.3236′S, 57°15.8544′E
Start hole: 0905 hr, 1 May 1998
End hole: 0700 hr, 2 May 1998
Time on hole: 21.92 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 740.0
Distance between rig floor and sea level (m): 11.0
Water depth (drill-pipe measurement from sea level, m): 729.0
Total depth (drill-pipe measurement from rig floor, mbrf): 741.50
Penetration (mbsf): 1.50

Principal Results

Site 1104 is located at a water depth of 731 m on the east rim of the Atlantis II Fracture Zone, ~200 m northwest of Hole 735B. This site was selected based on a video survey beginning at Hole 735B, by which we sought to find a reasonably flat, large outcrop to initiate the first spud tests of the hammer drill. During the transit from Cape Town, South Africa, the water hammer was successfully deck tested. The initial assembly of the drill string included just the SDS Digger Tools hammer and a concentric arm bit to test the spudding capability of the system. A frequency analyzer for monitoring hammer operations was built and installed during the transit.

After a 4-hr video survey starting at the Hole 735B guide base, we selected a location with an extensive, relatively flat-appearing outcrop and set the bit down on the outcrop to see how the hammer functioned without rotation. Several spud tests indicated the hammer was performing as expected, so we decided to recover the camera and begin hammer drilling Hole 1104A. After ~45 min, it appeared from rig floor observation that we had made about 1.5 m of penetration, so we deployed the camera to inspect the hole. We also noted excessive vibration of the stand pipe and derrick during hammer operations. A clean, circular hole appeared on the video image, so we recovered the camera and initiated a second test hole (Hole 1104B). After ~2 hr of rotation, we had made ~2 m of penetration but also noted increasing torque and slower rate of penetration (ROP). Another camera trip revealed a second clean, circular hole, but some apparent obliquity indicated that the hole had been initiated on a small local slope. We recovered the camera and attempted to spud a third hole, but the hammer would not actuate, so it was pulled to the surface.

Inspection of the concentric arm bit indicated that the reaming arms were damaged and that a valve had cracked in the hammer. The hammer was rebuilt, a new concentric arm bit installed, and we ran the assembly back to the seafloor. After a short video survey to inspect the site, we recovered the camera and spudded Hole 1104C. In <2 hr, although we noted about 2 m of penetration, there was an indication of high, erratic torque and the ROP effectively ceased. We attempted to initiate another hole (Hole 1104D) but made no advancement and experienced high, erratic torque. This hammer test was terminated, and we pulled the drill string. During the pipe trip, we deployed the two United States Geological Survey ocean bottom seismometers (OBS), ~100 and 300 m, respectively, from our drill site to monitor the noise transmitted through the outcrop that was generated by the hammer.

When inspection of the second concentric arm bit indicated once again that the underreamer arms had experienced excessive wear, a bit was modified by trimming the concentric arms to match the outside diameter of the pilot bit. After this modification, however, the bit did not appear robust enough to cut through the hard rock, so this modification was abandoned. A second modification removed the concentric arms, cut the bit shank, and welded the interval where the arms had been closed. We had hoped to test the drilling capability of the bit without the added challenge of attempting to ream out the hole. Unfortunately, during the modification of the bit, a crack developed, and the bit was set aside. We then modified a third bit by welding the concentric arms closed. This bit was tripped to the seafloor, and we initiated Hole 1104E. After ~1 hr, we had made ~1.5 m of penetration, but the bit stuck in the hole. We were able to free the bit with left-hand rotation, indicating that the arms had broken free and were causing the bit to stick. Having exhausted all the bits we had on board for hammer testing, and with the promise of delivery of a different bit design in a few days from a supply vessel, we chose to commit to conventional rotary coring while we waited for the equipment transfer. The OBS and positioning beacons were recovered, thus ending operations at Site 1104.

SITE 1105

Hole 1105A

Position: 32°43.1346′S, 57°16.6518′E
Start hole: 0902 hr, 2 May 1998
End hole: 1837 hr, 10 May 1998
Time on hole: 201.58 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 714.0
Distance between rig floor and sea level (m): 11.1
Water depth (drill-pipe measurement from sea level, m): 702.9
Total depth (drill-pipe measurement from rig floor, mbrf): 872.00
Penetration (mbsf): 158.00
Coring Totals: 30
Type: RCB
Number: 30
Cored: 143.00 m

Recovered: 118.43 m
Recovery: 82.82%
Formation: Gabbro

Principal Results

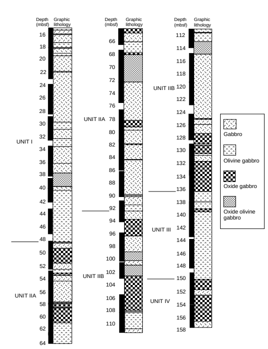
Because of delays in the arrival of the supply ship, which inhibited resumption of hammer tests near Hole 735B, Hole 1105A was drilled during Leg 179 for a period of 6 days. The hole was located ~1.2 km east-northeast of Site 735 on the Atlantis platform along the eastern transverse ridge of the Atlantis II Transform. The site is along a near-ridge axial trend with respect to Hole 735B but more distal from the north-south Atlantis II Transform, which lies to the west. The site was chosen to avoid a duplication of Hole 735B efforts that might occur by drilling at proximal Site 1104. At the same time, we wanted to utilize Hole 735B as a reference section to attempt lateral correlation of large-scale igneous units, structural features, and geophysical characteristics over the broader distance represented by the offset in holes in the direction approximately parallel to the former ridge axis. In addition, the site was chosen to help constrain the overall structure of the massif exposed on the platform. If successful, the correlation experiment could yield a minimum measure of the dimensions of subaxial magma chambers and continuity of structure and processes along the strike of the ridge axis at a very slow spreading center. If correlations are unsuccessful, the dimensions of igneous units, former magma chambers, or structures would be limited to a distance smaller than the scale of the offset experiment. Correlation will be attempted on the basis of detailed and integrated data sets including core descriptions and subsequent shore-based laboratory analyses to establish cryptic chemical and mineralogical variations and the alteration and structural framework in the core. A full and highly successful logging program that was completed after the cessation of drilling will aid in the correlation attempts.

The hole penetrated to a depth of 158.00 m, and the cored interval measured 143 m, starting 15.0 m below the seafloor (mbsf, see Table T1). Core recovery included 118.43 m of gabbroic rock for a total recovery of 82.8%. Together with logging results, this recovery provides a rather complete coverage of the rock types and a comprehensive view of pseudostratigraphy in the gabbroic section cored. Shipboard results now indicate a high probability that specific units, structures, and/or geophysical characteristics from Holes 735B and 1105A may be correlated.

T1. Coring summary for Hole 1105A, p. 12.

The cores recovered record a wide variety of rock types ranging from gabbro, oxide gabbro with as much as 20–25 modal% Fe-Ti oxides and olivine gabbro to scarcer troctolitic gabbro, gabbronorite, and felsic rocks such as trondhjemite. Within the core, 141 rock intervals have been described and defined on the basis of distinct changes in mode, modal proportions, grain size, and/or texture (Fig. F1). Well-defined igneous layer contacts or structural boundaries to these intervals are preserved in many sections of the core. The highly layered nature of the gabbroic rocks documented within the core is supported by high-quality continuous Formation MicroScanner (FMS) logs of the borehole, as well as other logs and whole-core magnetic susceptibility measurements. The scale of the layering in the core varies from a few centimeters to meters. On a broader scale, the intervals define four basic units from top to bottom consisting of (1) a gabbroic unit characterized by more primitive rock types and by a scarcity or lack of oxide gabbro, (2) a

F1. Hole 1105A lithostratigraphy, p. 11.



gabbroic unit characterized by a high abundance of oxide gabbro and oxide-bearing gabbro, (3) a gabbroic unit characterized by more primitive rock types and a lack of oxide gabbro, and finally (4) another unit rich in oxide gabbro and oxide-bearing gabbro. Rocks are crosscut by millimeter- to decimeter-sized veins of leucocratic gabbro, quartz diorite, trondhjemite, and irregular pegmatitic gabbro intrusions. Irregular veins and bands of oxide minerals have also been observed.

Thin sections indicate typical cumulate textures in the majority of samples that range from adcumulate to orthocumulate and show variable amounts of core-to-rim zoning in plagioclase. Poikilitic textures are also common with pyroxene as the oikocryst phase and plagioclase as the chadocryst phase. Igneous laminations were observed in several samples but were generally scarce or possibly overprinted by crystal-plastic fabrics in some deformed intervals of the core. Preliminary bulk rock geochemical results show a wide range in the chemistry of gabbroic rocks with Mg# varying from ~0.80–0.23, Fe_2O_3 from ~3.5–24.0 wt%, P_2O_5 from ~.01–4.1 wt%, Y from 7–192 ppm, Nb from 1–10 ppm, and Cr from 1–1066 ppm.

Alteration of the primary igneous mineralogy in the core is generally low but varies on the scale of a thin section to a meter. Alteration of olivine to chlorite, tremolite-actinolite, and talc is the most common manifestation of alteration, whereas plagioclase and clinopyroxene tend to be less altered. Clinopyroxene, when altered, is commonly partially replaced by patchy brown amphibole, but alteration to brown amphibole generally does not exceed 1%–2%. Where alteration is extensive, clinopyroxene is replaced by assemblages of actinolite and chlorite. Plagioclase is generally little altered.

Actinolite and chlorite are also the most common vein assemblages. Scarce high-temperature brown amphibole and low-temperature smectite and carbonate veins have also been observed.

The structure of the core is complex, and structural styles and intensities range from brittle to ductile. Most of the gabbroic samples cored possess igneous textures, but there are several parts of the core that display crystal-plastic fabrics. Mylonitic zones characterized by high oxide-mineral content were observed at ~53 and 71 mbsf. Centimeter- to decimeter-thick zones of ductile shear are restricted to the upper 90 m of core, whereas thicker zones of ductile deformation with weak to strong crystal-plastic fabrics become more prevalent at depths >90 mbsf. Intervals of penetrative ductile deformation in the lower portion of the core exceed 2 m in thickness. Zones of ductile deformation are commonly oxide rich, as are the contact regions between undeformed and ductilely deformed rocks. Oxide-gabbro rich zones tend to be strain localizers as many, but not all, of the crystal-plastic shear zones are rich in oxide minerals. Inclination of the ductile foliations vary from ~18° to 75° in the cored intervals and averages ~30°–35°. Thin sections show a range of textures from strictly igneous to slightly deformed igneous to dynamically recrystallized metamorphic textures with crystal-plastic fabrics. As deformation intensity increases, the effect can be most easily observed in plagioclase, where a progression from strain-free plagioclase to plagioclase with deformation twins, undulose extinction, kink bands, and dynamic recrystallization to neoblasts along grain margins progresses to porphyroclastic textures with small neoblasts of plagioclase and highly strained, kinked plagioclase, pyroxene, or olivine porphyroclasts. Olivine appears to have recrystallized to neoblast grain sizes prior to pyroxene, which tends to be preserved as the dominant porphyroclastic phase unless the intensity of deformation is most severe. Brittle fractures are generally filled with vein material such as actinolite and chlorite, but no large fault zones were recovered in the core. There were several regions of low recovery that could correspond to fault zones based on temperature, sonic, resistivity, and porosity logs. These regions of poor recovery generally sampled little intact core, although recovered gabbroic rocks are highly altered to smectite and contain carbonate veins.

Preliminary analysis of the downhole geophysical measurements from core and logging measurements yields a wide variety of information. Magnetic data indicate that the core possesses a single coherent magnetic direction with an average inclination of ~69°. This is compared with an inclination of –51° expected for the site. As in Hole 735B, these results indicate a consistently reversed polarity for the section and may indicate a significant block rotation of the massif similar in magnitude to rotations interpreted from Hole 735B (15°–20°). The consistency of the magnetic inclination downhole suggests that any relative rotations along ductile shear zones in the section must have occurred before cooling below the blocking temperature and are necessarily high temperature in nature. Magnetic susceptibility measurements clearly define zones of oxide gabbro and oxide-bearing gabbro documented in the core. Likewise, it provides a direct downhole comparison for the FMS logs, which measure resistivity. Oxide-rich zones are conductive, whereas oxide-free zones have high resistivity. Magnetic intensity on split cores ranges from ~0.2–5 A/m.

Lastly, a seismic-while-drilling (SWD) experiment was conducted at Hole 1105A and lasted for the duration of the drilling. The two OBS deployed were recovered and this data, together with accelerometer data from the drill rig, will be employed to test the feasibility of SWD during drilling operations of the *JOIDES Resolution*.

SITE 1106

Hole 1106A

Position: 32°43.32′S, 57°15.86′E
Start hole: 1938 hr, 10 May 1998
End hole: 2230 hr, 12 May 1998
Time on hole: 50.87 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 740.0
Distance between rig floor and sea level (m): 11.2
Water depth (drill-pipe measurement from sea level, m): 728.8
Total depth (drill-pipe measurement from rig floor, mbrf): 742.0
Penetration (mbsf): 2.00

Hole 1106B

Position: 32°43.32′S, 57°15.86′E
Start hole: 2230 hr, 12 May 1998
End hole: 1110 hr, 13 May 1998
Time on hole: 12.67 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 741.0
Distance between rig floor and sea level (m): 11.2
Water depth (drill-pipe measurement from sea level, m): 729.8
Total depth (drill-pipe measurement from rig floor, mbrf): 741.5
Penetration (mbsf): 0.50

Hole 1106C

Position: 32°43.32′S, 57°15.86′E
Start hole: 1110 hr, 13 May 1998
End hole: 2215 hr, 13 May 1998
Time on hole: 11.08 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 742.5
Distance between rig floor and sea level (m): 11.2
Water depth (drill-pipe measurement from sea level, m): 731.3
Total depth (drill-pipe measurement from rig floor, mbrf): 743.5
Penetration (mbsf): 1.00

Hole 1106D

Position: 32°43.32′S, 57°15.86′E
Start hole: 2215 hr, 13 May 1998
End hole: 0710 hr, 14 May 1998
Time on hole: 8.92 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 742.5
Distance between rig floor and sea level (m): 11.2
Water depth (drill-pipe measurement from sea level, m): 731.3
Total depth (drill-pipe measurement from rig floor, mbrf): 742.5
Penetration (mbsf): 0.00

Hole 1106E

Position: 32°43.32′S, 57°15.86′E
Start hole: 0710 hr, 14 May 1998
End hole: 2312 hr, 14 May 1998
Time on hole: 16.03 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 741.0
Distance between rig floor and sea level (m): 11.2
Water depth (drill-pipe measurement from sea level, m): 729.8
Total depth (drill-pipe measurement from rig floor, mbrf): 749.0
Penetration (mbsf): 8.00

Principal Results

After coring operations at Site 1105, we returned to the location of Site 1104 in anticipation of continued hammer testing. Although the supply vessel had arrived on site, heavy seas prevented the transfer after dark. Despite the same coordinates as Site 1104, because a new beacon was deployed and we wanted the record to indicate the next phase of hammer testing, this location was assigned as Site 1106. The hammer was tested on the deck in preparation for deployment, but continued deterioration of sea state prevented any transfer from the supply vessel. After waiting for the weather to improve, our operations team determined that we could continue with hammer operations if we could manage to transfer at least the bits from the supply vessel. An ingenious flotation device, created from several buoys, was assembled. The three bits were thrown overboard by the crew on the supply vessel one at a time and recovered by the crew on the *Resolution* despite seas that would not allow the two ships to converge.

Once the bits were transferred, we were ready to resume hammer testing. The hammer was run, and, after a brief seafloor survey, Hole 1106A was initiated. After about 2 m of penetration, the hammer ceased activity, and we tripped it back to the surface. Once again a valve had broken in the hammer, potentially from excessive heave during the continuing poor sea state. Hole 1106B was initiated on the ensuing pipe trip, which included the second of the three bits we acquired during the transfer (coincidentally, the last bit capable of drilling an overgauge hole), because the first was worn after Hole 1106A. Only ~0.5 m penetration was realized before the hammer ceased activity again, necessitating another pipe trip. Again the bit was worn, so it was replaced with the last of the bit configurations we had available, a flat-faced drilling bit. Our decision to run this bit was based on the assumption that if we could demonstrate the ability to make a hole, we could use this information in future bit design.

Hole 1106C was spudded and drilled ~1 m in <1 hr before the hammer stalled again. On the ensuing pipe trip, the piston in the hammer was replaced, and the flat-faced bit was run back to the seafloor. Hole 1106D was attempted, but the hammer would not operate, so it was pulled and rebuilt once again. Hole 1106E was initiated, and the hammer drill system performed admirably, cutting an 8-m-deep hole in <2 hr. At this time, the pressure transducer on the stand pipe gave way, so the pumps had to be shut down for repairs. Once the repair was completed, the driller noted no pressure buildup and was able to slowly lower the drill string to the total depth of the hole + 4 m, indicating we had lost some of the bottom-hole assembly. The subsequent camera trip indicated that the bit and hammer were indeed missing, and because we could not see these on the seafloor, we assume they are still in Hole 1106E. Weather conditions had still not improved, and we did not have a clear idea which of the several holes within a few m radius was Hole 1106E, so a fishing attempt was unrealistic. Given that we had exhausted all the bits and hammer spare parts, we declared the hammer test for Leg 179 complete and got under way for Ninetyeast Ridge.

In summary, while a detailed summation of all the data relevant to the hammer testing awaits postcruise development, we do have some preliminary impressions. We are encouraged by the performance of the hammer and will be able to use this series of tests for optimal design improvements. Despite the less than desired performance of the bits, again we are optimistic, particularly based on the last test where we made 8 m of penetration in <2 hr, that bit design improvements will yield improved performance in the future. Finally, as with all our operations, sea state appears to be a primary control, if not on the success of an operation, at least on its duration and ease of completion.

SITE 1107

Hole 1107A

Position: 17°01.4180′S, 88°10.8497′E
Start hole: 2024 hr, 22 May 1998
End hole: 0730 hr, 28 May 1998
Time on hole: 131.10 hr
Seafloor (drill-pipe measurement from rig floor, mbrf): 1659.0
Distance between rig floor and sea level (m): 11.3
Water depth (drill-pipe measurement from sea level, m): 1647.7
Total depth (drill-pipe measurement from rig floor, mbrf): 2152.80
Penetration (mbsf): 493.80

Principal Results

After an 8-day transit we arrived on Site 1107. There was an ambitious program outlined in our prospectus, including the establishment of a borehole for future installation of a subseafloor observatory, a conventional logging and vertical seismic profile experiment, deployment of a test installation of the strainmeter module in preparation for Leg 186, and the Ninetyeast Ridge Observatory (NERO) offset seismic experiment (NOSE) in conjunction with the continuing expedition of the Seismic Investigation at Ninetyeast Ridge Using *Sonne* and *JOIDES Resolution* (SINUS). We originally scheduled 11 days to complete these objectives. However, our extended port call, lost shipment, and extended transit times all worked to shorten our operational schedule, paring away 17 of our original 26 days of total operational time. This reduced our time on location at NERO from 11 days to <6 days. Our optimistic estimate indicated that even given this radical reduction, if all went extraordinarily well, we could still complete the borehole (although to a significantly less depth of penetration than our original target of 100–200 m into basement) and have some time remaining for the two-ship experiment. Our restricted schedule, however, required that we allocate no time for the many other operations we had hoped to complete at NERO.

After we arrived on site, we deployed a beacon and ran to seafloor with 48.82 m of 16-in casing fixed to a reentry cone. This assembly was washed in, and subsequently we reentered the hole with a 14¾-in tricone bit to drill a large borehole to allow deployment of 10¾-in casing some 30–40 m into basement. We also deployed the OBS and installed the Lamont-Doherty Earth Observatory sensor sub on the drill string to conduct our second SWD experiment. Based on Leg 121 statistics, we had hoped to drill to basement in 12 or so hr, and to drill at least 30–40 m into basement over the next 10 hr. Drilling the sediment column took longer than we expected, probably because of the size of the hole we were drilling and resistive layers of volcanic breccia and tuff overlying basement. Basement drilling also proceeded somewhat slower then we expected, although penetration rates were quite variable in the subaerially emplaced lava flows. At about 410 mbsf, we encountered a relatively hard layer, and the ROP slowed to <2 m/hr. In light of the fact that drilling in basement had, up to this point, proceeded reasonably quickly, we envisioned this hard layer as an ideal position to anchor the bottom of the casing with cement. After drilling to 422 mbsf to ensure that any material wiped off the walls of the borehole during emplacement of the casing would have a place to go and not impede casing operations, we terminated deepening Hole 1107A as we had reached our target depth for casing of ~40 m into basement.

In our optimistic schedule, developed after recognizing we only had 5.5 days of operational time, we hoped to set aside about 48 hr of ship time for the two-ship experiment. This time included pipe trips, set up and rig down time, and preparation to get under way (as this was to be our last operation), which resulted in an estimated 29 hr of shooting time for the two-ship experiment. Any additional time was to be allocated to deepening the hole. At this point in our operations, however, individually minor but collectively significant delays caused by handling pipe in heavy seas, slowed ROP, and mechanical difficulties had pared more than 25 hr from our already drastically reduced timetable.

By the time our last casing operation was completed (10¾-in casing set to 414 mbsf), we recognized there would not be sufficient time to clean out the cement shoe in the bottom of the casing, drill through the cement, clean out the rathole underneath, and make 10 m of new hole below the casing string. This was the absolute minimum envisioned as necessary to establish a borehole for the observatory emplacement. In our estimation, completing the borehole and allowing time for even a short two-ship experiment would have resulted in a 24-hr delay in our arrival in Darwin, Australia. This was not possible given the program's tight operational schedule and that the leg had already been extended 2 days beyond the original schedule.

Even with the disappointment we all felt regarding cancellation of the two-ship experiment, we recognized that although we did not have sufficient time to prepare for and rig down after a two-ship experiment (at least 20–24 hr), because we already had a drilling bit in the bottom of the hole, we did have enough operational time to deepen the borehole. We elected to use a tricone bit, rather than a coring bit, to ensure we could penetrate through the casing shoe without delay. This bit, although not allowing coring of the material drilled, did allow rapid penetration through the formation in the few hours remaining. We continued drilling to a depth of 493.8 mbsf, which is just over 120 m into basement and almost 80 m below the casing shoe. This depth should be more than adequate to allow a successful installation of the Ninetyeast Ridge Observatory. Postcruise processing is required to interpret the data collected during our SWD experiment; however, our initial inspection of the data indicates this will be possible.

Figure F1. Hole 1105A lithostratigraphy.

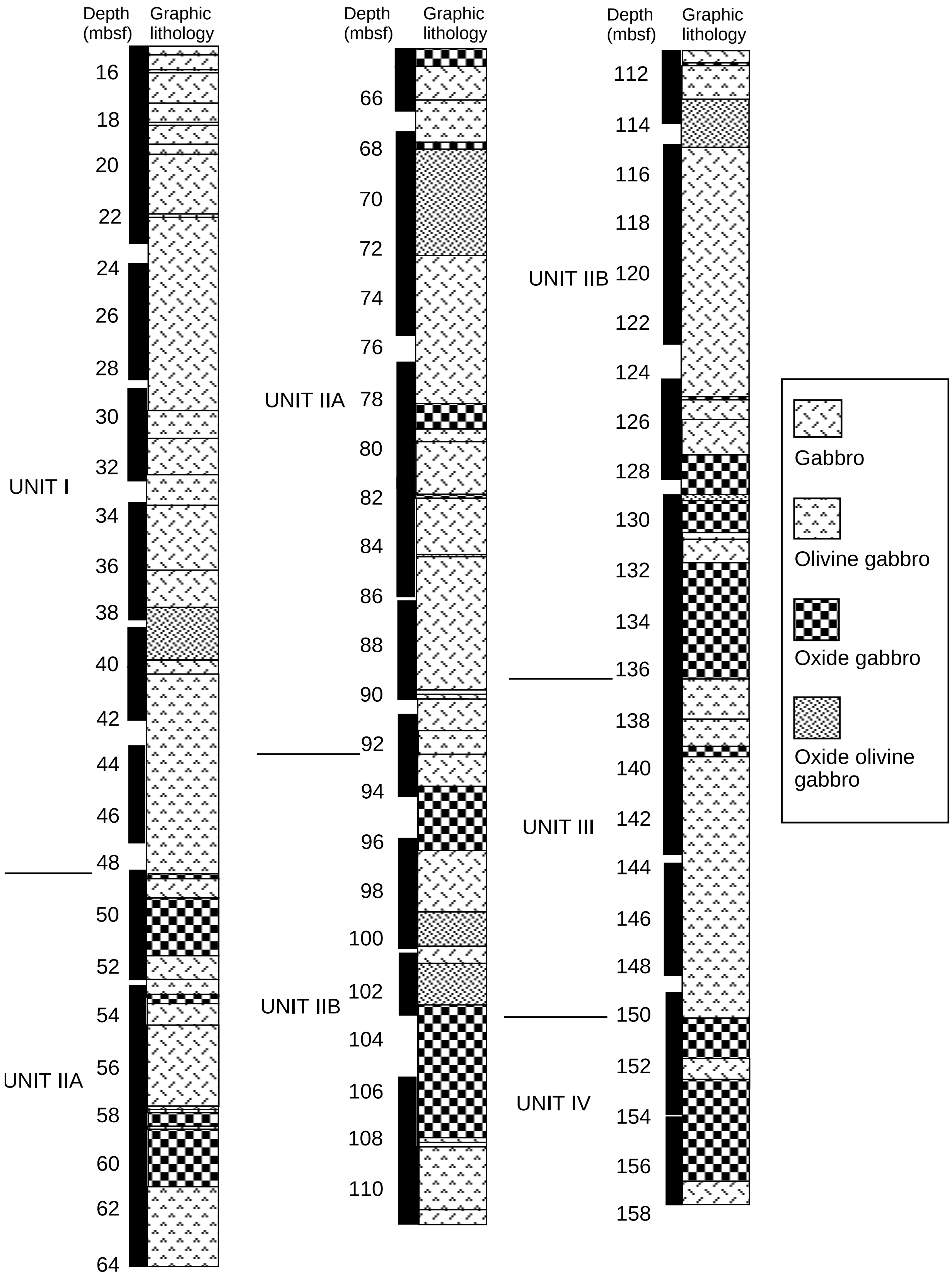


Table T1. Coring summary for Hole 1105A.

Core	Date (May 1998)	Time (UTC)	Depth (mbsf)	Length cored (m)	Length recovered (m)	Recovery (%)
179-1105A-						
Drilled interval	3	1430	0.00-15.00			
1R	4	0830	15.00-23.70	8.70	6.91	79.40
2R	4	1220	23.70-28.70	5.00	4.19	83.80
3R	4	1635	28.70-33.30	4.60	3.50	76.10
4R	4	2135	33.30-38.30	5.00	4.20	84.00
5R	5	0110	38.30-42.80	4.50	3.25	72.20
6R	5	0355	42.80-47.80	5.00	3.55	71.00
7R	5	0800	47.80-52.40	4.60	4.22	91.70
8R	5	1215	52.40-57.40	5.00	4.54	90.80
9R	5	1555	57.40-62.00	4.60	4.62	100.40
10R	5	1950	62.00-67.00	5.00	3.76	75.20
11R	6	0005	67.00-71.30	4.30	4.11	95.60
12R	6	1020	71.30-76.30	5.00	3.49	69.80
13R	6	1400	76.30-81.00	4.70	4.89	104.00
14R	7	0500	81.00-86.00	5.00	4.30	86.00
15R	7	0900	86.00-90.60	4.60	3.38	73.50
16R	7	1400	90.60-95.60	5.00	3.00	60.00
17R	7	1825	95.60-100.20	4.60	4.64	100.90
18R	7	2145	100.20-105.20	5.00	2.22	44.40
19R	8	0340	105.20-109.80	4.60	4.31	93.70
20R	8	0540	109.80-110.80	1.00	1.09	109.00
21R	8	0930	110.80-115.10	4.30	2.81	65.30
22R	8	1410	115.10-119.40	4.30	4.01	93.30
23R	8	1850	119.40-124.40	5.00	3.06	61.20
24R	8	2230	124.40-129.00	4.60	3.61	78.50
25R	9	0240	129.00-134.00	5.00	4.75	95.00
26R	9	0600	134.00-138.70	4.70	4.57	97.20
27R	9	0925	138.70-143.70	5.00	4.39	87.80
28R	9	1250	143.70-148.40	4.70	4.68	99.60
29R	9	1720	148.40-153.40	5.00	4.74	94.80
30R	9	2330	153.40-158.00	4.60	3.64	79.10
Coring totals:				143.00	118.43	82.82
Drilled total:				15.00		
Combined total:				158.00		