

CRUISE REPORT

SEAREX CRUISE I: SEDIMENT CORING AND MINERAL AEROSOL  
PROGRAM

R/V MOANA WAVE  
April 28, 1986 - June 3, 1986  
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12 cores

## CRUISE CORING LOG

4/29/86 Leave Honolulu at 2200 hours, local.

4/30/86 Arrive at first coring target 2030 Z

## QUADROPOD (QPOD) 1

**Nature of Station:** QPOD 1 deployed in small area of flat-lying sediments between two abyssal hill ridges with 150 m of relief. The area is about 2 n mi across. Target = 25°N, 155°W. Location at start of coring operation = 25°06.68'N 154°52.14'W, uncorrected water depth 5430 m.

**Rigging Notes:** Quadropod deployed with two corers.

**Deployment Notes:** Pinger malfunctioned, did not give bottom return. Set corer down at 10 m/min about 3 minutes before delay cycle ended. No indication of weight loss on tensiometer. Quadropod returned with mud on side which holds the Pajari compass. Cores had not triggered. Pistons were still in place. Pajari compass indicated tilt of 9° away from the pin, bearing 159°. This suggests that the corer was upright when the Pajari was triggered and that it fell over later.

**Recovery:** No recovery.

## PISTON CORE (PC) 2

**Nature of Station:** Deployed in same area as QPOD 1. Location at start of coring operation = 25°09.41'N, 154°53.94'W, uncorrected water depth 4625 m.

**Rigging Notes:** 30 ft piston core. Piston Core orienting device in place. No trigger weight corer.

**Deployment Notes:** Tension drop = 3500#; pullout tension = 9000#. Wire out = 5040 m.

**Recovery:** Recovered 4.58 m of brown clay sediment. Three sections:

Sec I: 150 cm	(308-458 cm)
Sec II: 148 cm	(160-308 cm)
Sec III: 160 cm.	(0-160 cm)

**PCC 2 (cont.)**

**Recovery Notes:** Liner sections separated in core barrel. Break was between Sec. II and Sec. III. Sediment disturbance in this interval. Piston core orienting device did not trigger. The magnet holding the reed switch closed did not pull out of its socket when the piston core tripped.

4/30/86      Leave first coring target 0830 Z  
                  Transit to second coring target at 30°19.9'N 157°49.9'W.

5/1/86        Transit

5/2/86

**PC 3**

**Nature of station:** Subseabed Disposal Project MPG-2 area. Target = 30°19.9'N 157°49.9'W, Location of LL44-GPC3. Location at start of coring operation = 30°19.42'N 157° 48.80'W, uncorrected water depth 5600 m.

**Rigging:** 30 ft piston core. Piston core orienting device deployed, no trigger weight corer.

**Deployment notes:** Tension drop = 6000#; pullout tension = 11000#, wire out = 6100 m; Ship location on pullout = 30°21.23'N, 157°48.66'W.

**Recovery:** Recovered 5.68 m brown clay.  
 Core cut into 1 m sections to allow pore water sampling.  
 Six sections:

Sec 1: 100 cm	(468-568 cm)
Sec II: 100 cm	(368-468 cm)
Sec III. 100 cm	(268-368 cm)
Sec IV: 100 cm	(168-268 cm)
Sec V: 100 cm	(68-168 cm)
Sec VI: 68 cm	(0-68 cm)

Piston core orienting device film was exposed.

**QPOD 4**

**Nature of station:** QPOD 4 deployed in MPG-2 Area. Target = 30°19.9'N, 157°49.9'W, location of LL44-GPC3. Location at start of coring = 30°23.32'N 157°45.42'W, uncorrected water depth 5640 m.

**QPOD 4 (Cont.)**

**Rigging:** Rigged for two cores.

**Deployment notes:** Actual core station probably considerably different from initial location. Ship moved almost 2 km during deployment in order to maintain heading for aerosol sampling. Total wire out at end of sample interval = 6773 m. Location at sample time = 30°22.3'N 157°43.3'W.

**Recovery:** Pajari reading: azimuth 129.5°, tilt = 10° toward the pin.

Recovered 2 cores:

Core #2 = 86 cm brown clay with 4 Mn nodules at the surface.

Core #3 = 80 cm brown clay with 3 Mn nodules at the surface.

5/3/86-5/6/86 Aerosol Sampling in vicinity of 32.5°N 152°W

5/6/86 Station Operations:

**QPOD 5**

**Nature of station:** Deployed quadropod in area of low-relief abyssal hills for "32.5°N" generic target. Bottom relief about 200 m maximum. Sediment cover on hills as well as in valleys. Average sediment thickness about 25 m. Sediment is transparent on 3.5 KHz with second strong reflector at 6 to 10 m depth. Location at start of coring = 33°02.6'N 153°10.37'W, 5275m uncorrected water depth. Sediment thickness 25 m, second reflector at 7 m.

**Rigging:** Rigged for three cores.

**Deployment notes:** Ship strayed off target by almost 2 n mi. trying to keep heading into wind. Corer probably landed on side of gentle slope on abyssal hill. Corer did not show signs of having tipped over, but had brown mud up nearly 60 cm on the frame. May have plowed into sediment on landing.

**Recovery:** No recovery.

5/7/1986

## PC 6

**Nature of station:** PC6 deployed in area of low-relief abyssal hills for "32.5°N" target at 32°47'N, 152°27'W. Bottom relief about 200 m maximum. Sediment cover 30 m. Sediment is transparent on 3.5 KHz with second strong reflector at 10 m. Location at start of coring operation = 32°45.7'N 152°24.7'W, 5300 m uncorrected water depth.

**Rigging notes:** 30 m piston core. Piston core orienting device deployed; no trigger weight corer.

**Deployment notes:** Tension before trip 7500#, Tension dropped to 5500# at trip, pullout tension 10,000#. Location at sample time: 32°45.19'N 152°23.12'W. ship moved ~1.5 nm during deployment.

**Recovery:** Recovered 7.18 m brown clay.

Core cut into 1 m sections to allow pore water sampling.

Eight sections:

Sec I: 100 cm	(618-718 cm)
Sec II: 100 cm	(518-618 cm)
Sec III: 100 cm	(418-518 cm + a little from between liner sections)
Sec IV: 100 cm	(318-418 cm)
Sec V: 100 cm	(218-318 cm)
Sec VI: 100 cm	(118-218 cm)
Sec VII: 100 cm	(18-118 cm)
Sec VIII: 18 cm.	(0-18 cm)

Piston core orienting device film exposed.

**Recovery notes:** Core disturbance between Sec III and IV where liner sections separated.

**Sampling:** Samples taken for pore water from:

616-618 cm

716-718 cm

5/8/1986

### QPOD 7

**Nature of station:** Quadropod deployed in target for "32.5°N" generic site. Bottom has minimal relief. Nearest abyssal hills have about 100 m of relief. Sediment thickness 25 m (20 m on hills; 30 m in valleys; 25 m in flat areas) with prominent reflect at 10 m. Initial location = 32°42.6'N 151°51.4'W, 5585 m uncorrected water depth.

**Rigging:** Rigged for three cores.

**Deployment notes:** Location during sample interval = 32°43.31'N 151°47.19'W, wire out = 6614 m. QPOD fell partway over. Pajari reads 46° away from the pin, azimuth 315°.

#### Recovery:

Core #1 contained some material.

**Recovery notes:** Top of sediment has about a 45° angle. Core probably taken at an angle.

5/9/1986 - 5/11/1986 Aerosol Sampling between 35°N, 150°W and 42°N, 151°W

5/11/1986

### PC 8

**Nature of station:** Generic "42°N" target. PC 8 deployed in area of flat lying sediments extending for about 4 nm. Area has 20-25 m sediment thickness with prominent reflector at 6-10 m depth which parallels surface reflector. Weaker second reflector at about 15 m depth in some areas. Location at start of coring operation = 42°56.91'N, 151°25.71'W, uncorrected water depth 5160 m. Depth to first reflector 10 m.

**Rigging:** 30 ft piston corer. Rigged 1 m trigger corer out of a piece of piston core barrel with core catcher and cutter; 100# weight. Piston core orienting device on piston corer.

**Deployment notes:** Tension drop = 4500#, pullout tension = 10000#, wire out not recorded. PGR depth at pullout 5165 m (uncorrected). Location at pullout 42°53.33'N 151°25.09'W.

PC 8 (Cont.)

**Recovery:**

Piston corer: recovered 6.31 m of brown clay sediment. Seven sections:

Sec I: 100 cm	(531-631 cm)
Sec II: 100 cm	(431-531 cm)
Sec III: 95 cm	(336-431 cm)
Sec IV: 100 cm	(236-336 cm)
Sec V: 100 cm	(136-236 cm)
Sec VI: 100 cm	(36-136 cm)
Sec VII: 36 cm	(0-36 cm)

Trigger corer: 6 cm recovery.

**Sampling:**

samples squeezed for pore waters:  
0-4 cm of trigger weight  
630-631 cm

5/12/1986 - 5/14/1986 Aerosol sampling between 42°N, 151°W and 47°N, 152°W

5/14/1986

**PC 9**

**Nature of Station:** Generic "47°N" target. PC 9 deployed in area of low rolling topography (~ 30 m of relief over 2 nm). Very strong bottom reflector with several reflectors combined to form dark bottom return--possibly turbidites below reflector. Sediment thickness 15-20 m above reflector. Location at start of coring operation = 46° 51.47'N 152° 18.95'W, uncorrected water depth 5130 m.

**Rigging:** 30 ft piston corer. Rigged 1 m trigger corer out of a piece of piston core barrel with core catcher and cutter; 100# weight. Piston core orienting device on piston corer.

**Deployment notes:** Tension drop = 5000#, pullout tension = 9500#, wire out = 5373 m, PGR depth at pullout 5080 m (uncorrected). Location at time of pullout 46° 54.17'N 152° 17.30'W.

**PC 9 (Cont.)****Recovery:**

Piston corer recovered 8.23 m brown clay sediment. Eight sections:

Sec I	100 cm	(723-823 cm)
Sec II	100 cm	(623-723 cm)
Sec III	100 cm	(523-623 cm)
Sec IV	100 cm	(423-523 cm)
Sec V	100 cm	(323-423 cm)
Sec VI	100 cm	(223-323 cm)
Sec VII	100 cm	(123-223 cm)
Sec VIII	123 cm	(0-123 cm; Mn nodules at top of section)

Trigger corer: no recovery

**Recovery notes:** Accident on board prevented getting Sec I-III out of barrel on 14 May: recovery had been at night and we began steaming in bad weather with fantail closed to further work. Sec I-III were left in liner, inside barrel. Tied off horizontally on deck and left outside ( $t = 46^{\circ}\text{F}$ ) with plaster bags over ends to protect sediment. Sec VIII was badly cracked. The entire to 50 cm of the liner was taped. Sec IV was also cracked. The liner was taped for its entire length.

**Sampling:**

samples squeezed for pore waters:

- 121-123 (Sec VIII)
- 221-223 (Sec VII)
- 321-323 (Sec VI)
- 421-423 (Sec V)
- 521-523 (Sec IV)

5/14/1986 - 5/17/1986 Aerosol sampling while steaming to Kodiak, AL

5/19/1986 - 5/21/1986 Aerosol sampling while steaming from Kodiak AL to  
47°N, 158°W

5/25/1986

**QPOD 10**

**Nature of station:** Generic "38°N" target. QPOD 10 deployed in rolling hills which have 30-50 m of relief over distances of 1 - 2 nm. Sediment thickness about 25 m with a strong reflector at 7 m. Location at start of coring operations = 37° 54'N, 168° 13'W, uncorrected water depth 5665 m.



**QPOD 10 (Cont.)**

**Rigging:** Quadropod deployed with three cores.

**Deployment notes:** Hydraulic line broke and had to pull up the corer because there was not enough time left on the timer to get the corer to the bottom before it went off. Batteries recharged for 30 min. Redeployed. Location at redeployment: 37° 52.99'N 168° 18.84'W, uncorrected water depth 5750 m. Wire out = 6830 m at sample time. Location at time of sample: 37° 50'N 168° 20'W.

**Recovery:** No recovery

**Recovery notes:** LED on timer not on. Batteries probably too run down to trigger sample interval.

5/25/1986 - 5/28/1986 Aerosol sampling between 38°N 168°W and 35°N, 169°W.

5/28/1986

**QPOD 11**

**Nature of station:** Generic "35°N" target. Area has abyssal hills with about 50 m of relief over 4 km. Sediment cover variable from 20-30 m. Prominent surface reflect, but the 2nd reflect seen over most of the areas we have surveyed is not present in this area. Location of start of coring operation = 35° 25.04'N 169° 18.5'W, uncorrected water depth 6000 m. Sediment thickness 20 m.

**Rigging:** Rigged for 3 cores. Deployed with 100 lb weight in a drogue configuration to minimize "kiting" due to ship have to move to keep bow in wind for aerosol sampling.

**Deployment notes:** Location at sample time = 35° 21.03'N, 169° 17.26'W, wire out 6415 m.

**Recovery:** No recovery

**Recovery notes:** QPOD never tripped. LED on timer battery pack still on, therefore no problem with timer battery. No mud on sides of QPOD frame to indicate a tipover. No mud on outside of core liners. Plate never went down. Pajari device appears to have stuck. May have gotten wet. Deck test of QPOD indicates that lower limit switch was remaining in position that told QPOD is had already taken sample. Took apart lower limit switch and found it was

**QPOD 11 (Cont.)**

flooded. Also found that throw on the magnetic reed switch was so small that it did not trip lower limit switch much of the time.

5/28/1986 - 6/1/1986 Aerosol sampling between 35°N, 169°W and 25°N, 155°W.

6/1/1986

**QPOD 12**

**Nature of station:** Same target location as at PC2 = 25° 10'N, 154° 54'W. Upper portion of Hawaiian swell. Thin sediment cover (~20 m) on gently rolling bottom. Seamounts about 10 nm away to E and W. Location at start of coring operation = 25° 11.05'N 154° 55.09'W, uncorrected water depth 4920 m. Sediment thickness about 15m. No second reflector above bottom.

**Rigging:** Deployed with three cores. Rigged with 100 lb drogue in order to minimize "kiting" due to ship movement.

**Deployment notes:** Location at sample time = 25° 12.42'N 154° 55.09'W. Wire out = 5320 m.

**Recovery:** Three cores. Pajari tilt needle did not fire. Azimuth = 34.5°

**Recovery notes:** side of QPOD with relay has mud on it. QPOD probably fell over or dragged, but cores have no indication of disturbance. Cores each have Mn nodules on top.