

DF-97 ROAVERRS TECHNICAL CRUISE REPORT
SEDIMENT TRAP RECOVERY/DEPLOYMENT CRUISE
ROSS SEA ANTARCTICA
R/V N.B. PALMER (DEC. 6, 1996 to JAN. 10, 1997)

by

David A. Mucciarone

Cruise Participant: Robert B. Dunbar (S-216A Group leader and 96-06 cruise Chief Scientist), David A. Mucciarone, Harry D. Rowe, and Charlotte E. Kelchner (S-216A) from Rice University, and Stefano Miserocchi, and Elio Paschini from Programma Nazionale di Ricerche in Antartide, Istituto di Geologia Marina (IGM)

Logistics and Objectives:

I departed Houston IAH at 1530 on 12/01/96 and arrived in Christchurch, NZ (CHC) at 1130 on 12/03/96. Rob Dunbar and I joined up at LAX and continued on to CHC on the same flights. Harry Rowe departed IAH on 11/28/96 and arrived in CHC on 11/30/96 to meet up with David Chipman for training on the underway pCO₂ system. Charlotte arrived in CHC from MCM on 11/29/96 for training on filtration for nitrogen. Both Stefano Miserocchi and Elio Paschini (IGM) arrived in CHC on 12/03/96.

After a 2 day (12/05/96) stay in Christchurch, NZ, we moved on to the R/V Nathaniel B. Palmer. Due to delays in repairing one of the main engines on the vessel it was necessary to spend another 5 days on the R/V NBP at the docks in Littleton, NZ. After successful sea trials on 12/10 on the morning of 12/11 at 0730 we pulled away for good and began our trek south towards the Ross Sea and begin cruise 96-06.

Even with the delays in the ships schedule, we put the time to good work by setting up the elemental analyzer for analyses of total dissolved inorganic carbon (TDIC), total particulate organic carbon (TPOC), and $\delta^{13}\text{C}$ of both TDIC and TPOC. A stripping apparatus, similar to the one used on the Ross Sea cruise on the R/V Polar Duke and USCGC Polar Sea in 1992, was modified, set-up, tested, and calibrated to measure TDIC. We were also able to set up and calibrate our alkalinity apparatus, set up for filtering, and prepare to use the pCO₂ system left on board by David Chipman from LDEO who participated on the previous SJGOFS cruise. Lastly, we were able to stow all of the mooring gear on the ship with a majority of the assistance from ASA personnel.

Since we were able to set up early due to ship delays, we made measurements on our journey south to the ice. We collected water from the continuous feed sea water system and measured TDIC, alkalinity, and filtered for TPOC. The TDIC and alkalinity were mainly to train new users, calibrate the elemental analyzer and perfect our new technique. The pCO₂ system was also activated and data collected. While in transit to the Ross Sea I worked on learning how to use the Sea Bird SeaCat 16-04 data loggers, Aanderaa RCM7, 8, and 9 current meters, InterOcean S4 current meters, EdgeTech 8202 acoustic releases and deck unit, and McLane Mark 7G-13 sediment traps. On 12/18/96 at 1300L (Local = GMT + 13hr) we entered the Ross Sea at 72°S 175°E.

Summary of Field Operations:

Chief Scientist for cruise 96-06 and Group leader for S-216A was Robert Dunbar. The cruise began on 12/11/96 at 0730 from Littleton, NZ. Cruise 96-06 lasted 28 days, consisted of 119 stations (see Fig 1), 3 new mooring deployments, and 2 existing mooring serviced (see Fig. 2). The cruise on the RVIB N.B. Palmer ended in McMurdo at 1830L on 1/08/97.

Bag drag for me was 2230 on 1/08/97 with check-in at 0900 on 1/09/97. The LC-130 departed McMurdo at 1200 and arrived in Christchurch, NZ at 2110 on 1/09/97. On 1/10/97, I departed CHCH at 1420 and arrived in Houston (IAH) at 1835 on 1/10/97..

RVIB N.B. Palmer 96-06 Cruise:

My main objective on the RVIB N.B. Palmer 96-06 cruise was to service and install a number of moorings in the southwestern Ross Sea. In addition to these responsibilities I set up the elemental analyzer and pH meter for alkalinity. After being trained in Littleton, NZ and during our southern transit, Harry Rowe became the primary technician operating the elemental analyzer to run sea water samples for TDIC. Stefano Miserocchi, and Elio Paschini from Programma Nazionale di Ricerche in Antartide, Istituto di Geologia Marina (IGM) were my primary assistants in preparing and servicing the moorings. Charlotte Kelchner's primary duty was filtering sea water for POC and PON.

Mooring Operation:

Mooring K

The first mooring attempt was the Italian *Mooring K* located at 74° 42.0'S 164° 14.818'E, water depth 555 m in Terra Nova Bay on 12/21/96 (Fig. 2). Due to complete ice cover a recovery operation was not possible. We did not break ice around the mooring location at the request of the Italian Antarctic Program. The mooring is equipped with two McLane 78G-23 sediment traps, two Aanderaa RCM7 current meters, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, two EdgeTech 8202 acoustic releases, eight 3 pack Billings Floats, and one 30" steel Billings Buoy.

Mooring Gentoo

The next deployment was a new mooring called *Gentoo* installed on 12/23/96 at 0146 GMT (12/23/96 @ 1446L) and located at 76° 20.244'S 172° 58.758'E, water depth 620 m (Fig. 2). The mooring is equipped with two McLane 78G-13 sediment traps, four InterOcean S4 current meters, one Aanderaa RCM8 current meter, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, one EdgeTech 8202 acoustic release, eight 3 pack Billings Floats, and one 30" steel Billings Buoy.

Mooring F

Our next mooring operation was the recovery of the Italian *Mooring F* along the Ross Ice Shelf on 12/24/96 at 1410 GMT (12/25/96 @ 0310L) located at 77° 57.11'S 176° 55.56'W, water depth 602 m. The Zodiac was used to interrogate, release, and transfer the mooring to the NBP. Due to poor mooring configuration the seven Benthos type floats below the bottom Tucci sediment trap tangled into the current meter and SBE SeaCat 16-04 above the bottom Tucci trap making the recovery effort slow and difficult. The mooring was equipped with two Tucci 24 cup sediment traps, two Aanderaa RCM7 current meters, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, two EdgeTech 8202 acoustic release, seven Benthos type 17" floats, two 24" Resinex buoys, and one RDI ADCP in a 50" syntactic foam buoy. All of the instruments with the exception of the Tucci traps worked well. The Tucci trap pressure cases flooded and only 1 cup/trap was collected.

Mooring Fairy (relocated Mooring F)

We deployed *Mooring F* in a new location along the Ross Ice Shelf on 12/26/96 at 0745 GMT (12/27/96 @ 2045L) approximately 2.39 nm north at 77° 58.294'S 178° 02.274'W, water depth 698 m (Fig. 2). *Mooring F* has now been renamed for the Roaverr's project as *Fairy* and is now a joint US/Italian mooring with both programs providing instrumentation for the mooring. The mooring was equipped with one McLane 78G-13 sediment trap at the top and one Tucci 24 cup sediment trap at the bottom, two Aanderaa RCM7 current meters, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, two EdgeTech 8202 acoustic release, seven Benthos type 17" floats, two 24" Resinex buoys, and one RDI ADCP in a 50" syntactic foam buoy.

Mooring A'

Our next mooring operation was the recovery of the joint Rice University/Italian *Mooring A'* north of Ross Island on 12/29/96 at 0100 GMT (12/29/96 @ 1400L) located at 76° 41.025'S 169° 00.23'E, water depth 817 m. Interrogation, release and recovery of the mooring took place without the use of the Zodiac. The releases were a bit difficult to communicate with because of ship fantail position with respect to the mooring location. The mooring was recovered in a normal manner, no problems. The top OSU Tracer-15 sediment trap stop working at cup 5, carousel was manually rotated to collect cup 6. The bottom trap worked perfectly stopping as planned at cup 13. Both transmissometers failed to collect data as did the bottom Aanderaa RCM8 current meter. Both SBE SeaCat CTD and CT units worked as did both InterOcean 1090ED acoustic releases. The mooring was equipped with two OSU Tracer-15 sediment traps, two Aanderaa RCM8 current meters both with a transmissometers, two SeaBird Electronics (SBE) SeaCat one 16-04 CT and one 16 CTD units, two InterOcean 1090ED acoustic releases, six 3 pack Billings Floats, and one 30" steel Billings Buoy.

Mooring Adelie (Old Mooring A')

We deployed *Mooring A'* in approximately the same location north of Ross Island on 12/29/96 at 1755 GMT (12/30/96 @ 0655L) at 76° 41.084'S 168° 59.208'E, water depth 819 m (Fig. 2). *Mooring A'* has now been renamed for the Roaverris project as *Adelie* and is now a joint US/Italian mooring with both programs providing instrumentation for the mooring. The mooring was equipped with two OSU Tracer-15 sediment traps, one Aanderaa RCM8 current meters with a transmissometer and one RCM7, one InterOcean S4 current meter, two SeaBird Electronics (SBE) SeaCat one 16-04 CT and one 16 CTD units, two InterOcean 1090ED acoustic releases, six 3 pack Billings Floats, and one 30" steel Billings Buoy.

Mooring Chinstrap

We deployed *Mooring Chinstrap* on 12/31/96 at 1136 GMT (01/01/96 @ 0036L) at 76° 20.400'S 165° 03.220'E, water depth 825 m (Fig. 2). The mooring was equipped with two OSU Tracer-15 sediment traps, three Aanderaa current meters (one RCM 9, one RCM 8, and one RCM7), one InterOcean S4 current meter, two SeaBird Electronics (SBE) SeaCat one 16-04 CT and one 16 CTD units, one EdgeTech 8202 acoustic release, three 3 pack Billings Floats, and two 30" steel Billings Buoy.

Mooring Emperor

The last mooring we deployed was a new installation called *Mooring Emperor* located along the Ross Ice Shelf on 01/07/97 at 0755 GMT (01/07/97 @ 2055L) 76° 58.912'S 171° 58.745'E, water depth 675 m (Fig. 2). *Mooring Emperor* is located west of *Mooring F*. The mooring was equipped with one McLane 78G-13 sediment trap at the bottom, two InterOcean S4 current meters, two Aanderaa RCM8 current meters, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, one EdgeTech 8202 acoustic release, six 3 pack Billings floats, and one RDI ADCP in a 50" syntactic foam buoy.

MOORING GENTOO DEPLOYMENT STATISTICS: (December 23, 1996 @ 0146 GMT)

Information on the mooring equipment for *Mooring Gentoo*. The mooring deployment was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). Preparation of all equipment was a joint effort between Rice and IGM with assistance from Jim Barry of MBARI. There were no apparent difficulties or problems preparing the mooring or the individual instruments on this array. The McLane 78G-13 sediment traps, SeaBird SeaCat 16-04 CT units, EdgeTech 8202 dual channel acoustic release, and Aanderaa RCM8 (w/ pressure and conductivity sensors) are new instruments. Then InterOcean S4 current meters were serviced and tested prior to deployment. All floats, mooring line, and hardware were also new. A detailed outline on the deployment is listed below.

Top float package, 2-3 pack Billings floats in water @	1305L/(0005Z 12/23/96)
Top InterOcean S4 current meter in water @	1306
Lower top InterOcean S4 current meter in water @	1320
30" Billings steel buoy in water @	1325
Top McLane 78G-13 sediment trap in water @	1340
Aanderaa RCM8 current meter w/ P and T° sensors in @	1344
Top SBE 16-04 CT unit in water @	1345
Middle InterOcean S4 current meter in water @	1355
Middle float package, 5-3 pack Billings floats in at @	1400
Bottom McLane 78G-13 sediment trap in water @	1415
Bottom float, 1-3 pack Billings float	1437
Top SBE 16-04 CT unit in water @	1338
Bottom InterOcean S4 current meter in water @	1339
EdgeTech 8202 acoustic release in water @	1340
Anchor released @	1346L (0146Z 12/23/96)

McLane 78G-13 Sediment Trap Deployment Statistics: (TOP)

Trap Cups Deployed:	13
Deployment Filename:	GENTOO96.TOP
TattleTale Interface Serial Number:	6851
Battery Condition:	9.58 VDC (1-Micro 9v alkaline) 21.24 VDC (14-Motor C-cell alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.
Trap History:	Same as Bottom trap, see below

McLane 78G-13 Sediment Trap Deployment Statistics: (BOTTOM)

Trap Cups Deployed:	13
Deployment Filename:	GENTOO96.BOT
TattleTale Interface Serial Number:	2242
Battery Condition:	9.58 VDC (1-Micro 9v alkaline) 21.24 VDC (14-Motor C-cell alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.
Trap History:	Same as Top and as follows

Mooring Gentoo Top and Bottom Sediment Trap Deployment date- 23 December 1996 at 0146, and Programming. McLane 78G-13 Sediment Traps trap begin and end at an open hole under funnel.

Duration	GMT Time	GMT Date	Event #	Cup#
--- Days	0146	23 December 1996	Event 0	Open
09 Days	0600	23 December 1996	Event 1	Cup 1
15 Days	0600	01 January 1997	Event 2	Cup 2
16 Days	0600	16 January 1997	Event 3	Cup 3
14 Days	0600	01 February 1997	Event 4	Cup 4
14 Days	0600	15 February 1997	Event 5	Cup 5
14 Days	0600	01 March 1997	Event 6	Cup 6
17 Days	0600	15 March 1997	Event 7	Cup 7
44 Days	0600	01 April 1997	Event 8	Cup 8
61 Days	0600	15 May 1997	Event 9	Cup 9
62 Days	0600	15 July 1997	Event 10	Cup 10
47 Days	0600	15 September 1997	Event 11	Cup 11
30 Days	0600	01 November 1997	Event 12	Cup 12
31 Days	0600	01 December 1997	Event 13	Cup 13
	0600	01 January 1998	Event 14	Open

SeaBird SeaCat 16-04 CT units:

TOP SBE S/N: 1615016-2260
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/22/96 @ 21:30:00

BOTTOM SBE S/N: 1615016-2261
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/22/96 @ 20:30:00

Aanderaa RCM8 current meter:

RCM8 S/N: 12118
 Battery condition: 6.67 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/22/96 @ 10:30:00

InterOcean S4 current meters:

#1 S4 S/N: 07881689
 Battery condition: 7.89 VDC (6 lithium D-cells)
 Sampling interval: 1minute every 15 minutes
 GMT Start: 12/22/96 @ 23:00:00

#2 S4 S/N: 05451197
 Battery condition: 7.85 VDC (6 lithium D-cells)
 Sampling interval: 1minute every 15 minutes
 GMT Start: 12/22/96 @ 12:00:00

#3 S4 S/N: 05451402
 Battery condition: 7.88 VDC (6 lithium D-cells)
 Sampling interval: 1minute every 15 minutes
 GMT Start: 12/22/96 @ 12:00:00

#4 S4 S/N: 07881691

Battery condition: 7.88 VDC (6 lithium D-cells)
 Sampling interval: 1 minute every 15 minutes
 GMT Start: 12/22/96 @ 23:00:00

Gentoo Mooring Hardware Statistics:

Two 3 pack floats	=	1 m
Top InterOcean S4 current meter S/N 07881689 (-4 lbs./-1.82 kg)	=	0.46 m
Top InterOcean S4 current meter S/N 05451197 (-4 lbs./-1.82 kg)	=	0.46 m
Top 30" steel float (+369 lbs./-167.73 kg)	=	0.762 m
Top McLane 78G-13 trap w/ pendant S/N 6851 (-77 lbs./-35 kg)	=	5.1 m
-Above top of cone = 2.7 m, below top of cone 2.4 m		
Top Aanderaa RCM8 current meter S/N 12118 (-50 lbs./22.73 kg)	=	0.52 m
Top SBE SeaCat 16 CTD unit S/N 1615016-2260 (-32 lbs./-14.55 kg)	=	0.84 m
Middle InterOcean S4 current meter S/N 05451402 (-4 lbs./-1.82 kg)	=	0.46 m
Five 3 pack floats (+330 lbs./150 kg)	=	2.5 m
Bottom McLane 78G-13 trap w/ pendant S/N 2242 (-77 lbs./-35 kg)	=	5.1 m
-Above top of cone = 2.7 m, below top of cone 2.4 m		
Bottom SBE SeaCat 16 CTD unit S/N 1615016-2260 (-32 lbs./-14.55 kg)	=	0.84 m
Bottom InterOcean S4 current meter S/N 07881691 (-4 lbs./-1.82 kg)	=	0.46 m
EdgeTech 8202 dual channel acoustic release S/N020896 (75 lbs/34.1 kg)	=	1.14 m
Galvanized 1/2" anchor chain	=	3.0 m
Anchor 1800 lb./818.2 kg	=	1 m

All rope is: 546.5- Meters 11 mm single braid Duron w/ 1/2" nylon thimbles
 Hardware: 22- 1/2" galvanized chain shackles (floats)
 17- 1/2" stainless steel anchor shackles
 14- 5/8" galvanized anchor shackles
 01- 5/8" galvanized eye and eye swivel
 04- 3/8" stainless steel chain shackles (CTD meters)
 01- 1/2" galvanized chain, 4 meters long
 01- EdgeTech release links
 02- 1/2" galvanized pear master link

EdgeTech 8202 Release Command Codes for *Mooring Gentoo*:

S/N 020896	
Command A (Release)	626156
Command B (Disable A)	607210
Command C (Enable A & B)	607233
Command D (Disable B)	607256

New Mooring Location: 76° 20.244'S 172° 58.758'E
Water Depth: 819 meters
Date/Time (GMT) 12/23/96 @ 0146

ITALIAN MOORING F (NOW MOORING FAIRY) RECOVERY STATISTICS: (December 24, 1996 @ 1136 GMT)

Information on the mooring equipment for *Mooring F*. The mooring recovery was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). The release of the mooring was done from the ship. A Zodiac was launched to tether the top ADCP float and bring the tag line to the ship. The Zodiac and personnel were then recovered and the mooring recovery operation continued. There were some difficulties with the mooring recovery. Due to poor mooring design the array came up tangled and special care was taken to make sure the sediment trap did not invert during the recovery. Below is a detailed outline of the recovery effort.

Released mooring from ship @	0036L/(1136Z 12/24/96)
Launched Zodiac @	0055
Tag line to ship @	0130
Recovered Zodiac @	0135
Top float with RDI ADCP on deck @	0140
Top Tucci 24 cup sediment trap on deck @	0150
Top Aanderaa RCM7 on deck @	0205
Top SBE SeaCat 16-04 CT unit on deck @	0205
Benthos 7 float array on deck @	0220*
Middle Aanderaa RCM7 on deck @	0220*
Bottom SBE SeaCat 16-04 CT unit on deck @	0220*
Middle Pair of Resinex buoys on deck @	0230*
Bottom Aanderaa RCM7 on deck @	0240
Dual EdgeTech 8202 acoustic releases on deck @	0244
Bottom Tucci 24 cup sediment trap on deck @	0310L(1410Z 12/24/96)

Note: *Mooring came up tangled up with bottom Benthos floats and middle Aanderaa RCM7 current meter and bottom SBE SeaCat 16-04 CT unit. The order of recovery does not represent the ordering of instrumentation on the mooring.

EdgeTech 8202 Release Command Codes *Mooring F*:

S/N 17091		S/N 170192	
Command A (Release)	535420	Command A (Release)	535445
Command B (Disable A)	560272	Command B (Disable A)	560345
Command C (Enable A & B)	560303	Command C (Enable A & B)	560366
Command D (Disable B)	560320	Command D (Disable B)	560401

Mooring F Location:	77° 57.11'S 176° 55. 56'W
Water Depth:	602 meters
Date/Time (GMT)	12/24/96 @ 1136

Results of the mooring instrumentation and servicing.

The RDI ADCP worked well, but had difficulties communicating. The stainless steel quick links were difficult to work with (i.e., did not disconnect quickly) and were replaced with 1/2" stainless steel shackles in the appropriate locations on the mooring line. The EdgeTech 8202 acoustic releases worked well as did the three Aanderaa RCM7 current meters and two SBE 16-04 CT units. Both Tucci 24 cup sediment traps failed due to flooded pressure cases. Only one cup was collected on each of the sediment traps. One of the Tucci 24 cup sediment traps were repaired (Bottom) and the other replaced with a McLane 78G-13 sediment trap (S/N 2243).

The download of data and instrument preparation were handled by IGM and Rice. The mooring was redesigned to prevent the entanglement of the mooring line and instrumentation during the next recovery

attempt. There were continued communication problems with the RDI ADCP that were related to the generic battery packs. These battery packs were modified and no more communications problems were experienced. A rotor one of the middle Aanderaa RCM7 current meter was replaced after being damaged in the entanglement of the mooring line during the recovery. Original *Mooring F* was relocated and renamed as *Mooring Fairy* and is now a joint Italian/US mooring.

MOORING FAIRY (OLD MOORING F) DEPLOYMENT STATISTICS: (December 26, 1996 @ 0627 GMT)

Information on the mooring equipment for *Mooring Fairy*. The mooring deployment was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). Preparation of all equipment was a joint effort between Rice and IGM. There were some problems and difficulties preparing the mooring and individual instruments on this array. However, having a backup RCM7 to replace the current meter damaged during the recovery and a prepared McLane 78G-13 sediment trap (new instrument) did help expedite the mooring turn around. These are discussed above. A detailed outline on the deployment is listed below.

Top float with RDI ADCP in water @	1927L/(0620Z 12/26/96)
Top McLane 78G-13 sediment trap in water @	1937
Top SBE 16-04 CT unit in water @	1938
Top Aanderaa RCM7 in water @	1338
Middle float package, 2 Resinex buoys and 2 Benthos floats in water @	1945
Bottom SBE 16-04 CT unit in water @	1949
Middle Aanderaa RCM7 in water @	2000
Bottom Tucci 24 cup sediment trap in water @	2002
5 single Benthos floats in water @	2015
Bottom Aanderaa RCM7 in water @	2032
Dual EdgeTech 8202 acoustic releases in water @	2031
Anchor released @	2037L (0731Z 12/26/96)

McLane 78G-13 Sediment Trap Deployment Statistics: (TOP)

Trap Cups Deployed:	13
Deployment Filename:	FAIRY96.TOP
TattleTale Interface Serial Number:	2243
Battery Condition:	9.57 VDC (1-Micro 9v alkaline) 21.4 VDC (14-Motor C-cell alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.

Tucci 24 Cup Sediment Trap Deployment Statistics (IGM): (BOTTOM)

Trap Cups Deployed:	24
Deployment Filename:	N/A
TattleTale Interface Serial Number:	N/A
Battery Condition:	N/A
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.

Mooring Fairy Top and Bottom Sediment Trap Deployment date- 26 December 1996 at 0736 GMT, and Programming. McLane 78G-13 and Tucci Sediment Traps trap begin and end at an open hole under funnel.

McLane 78G-13 sediment trap program:

Duration	GMT Time	GMT Date		Event #	Cup#
--- Days	0736	26 December	1996	Event 0	Open
21 Days	1400	26 December	1996	Event 1	Cup 1
16 Days	0600	16 January	1997	Event 2	Cup 2
14 Days	0600	01 February	1997	Event 3	Cup 3
14 Days	0600	15 February	1997	Event 4	Cup 4
14 Days	0600	01 March	1997	Event 5	Cup 5
17 Days	0600	15 March	1997	Event 6	Cup 6
44 Days	0600	01 April	1997	Event 7	Cup 7
61 Days	0600	15 May	1997	Event 8	Cup 8
62 Days	0600	15 July	1997	Event 9	Cup 9
47 Days	0600	15 September	1997	Event 10	Cup 10
24 Days	0600	01 November	1997	Event 11	Cup 11
25 Days	0600	25 November	1997	Event 12	Cup 12
43 Days	0600	01 December	1997	Event 13	Cup 13
	0600	01 February	1998	Event 14	Open

Tucci 24 cup sediment trap programming:

Duration	GMT Time	GMT Date		Event #	Cup#
--- Days	0736	26 December	1996	Event 0	Open
15 Days	0600	27 December	1996	Event 1	Cup 1
15 Days	0600	11 January	1997	Event 2	Cup 2
15 Days	0600	26 January	1997	Event 3	Cup 3
15 Days	0600	10 February	1997	Event 4	Cup 4
15 Days	0600	25 February	1997	Event 5	Cup 5
15 Days	0600	12 March	1997	Event 6	Cup 6
15 Days	0600	27 March	1997	Event 7	Cup 7
15 Days	0600	11 April	1997	Event 8	Cup 8
15 Days	0600	26 April	1997	Event 9	Cup 9
15 Days	0600	11 May	1997	Event 10	Cup 10
15 Days	0600	26 May	1997	Event 11	Cup 11
15 Days	0600	10 June	1997	Event 12	Cup 12
15 Days	0600	26 June	1998	Event 13	Cup 13
15 Days	0600	11 July	1997	Event 14	Cup 14
15 Days	0600	26 July	1997	Event 15	Cup 15
15 Days	0600	10 August	1997	Event 16	Cup 16
15 Days	0600	25 August	1997	Event 17	Cup 17
15 Days	0600	09 September	1997	Event 18	Cup 18
15 Days	0600	24 September	1997	Event 19	Cup 19
15 Days	0600	09 October	1997	Event 20	Cup 20
15 Days	0600	24 October	1997	Event 21	Cup 21
15 Days	0600	08 November	1997	Event 22	Cup 22
15 Days	0600	23 November	1997	Event 23	Cup 23
15 Days	0600	08 December	1997	Event 24	Cup 24
	0600	23 December	1997	Event 25	Open

SeaBird SeaCat 16-04 CT units:

TOP SBE S/N: 167881-1434 (IGM)
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/26/96 @ 06:30:00

BOTTOM SBE S/N: 167881-2082 (IGM)
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/26/96 @ 07:00:00

Aanderaa RCM7 current meters:

RCM7 S/N: 12032 (IGM)
 Battery condition: 6.67 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/26/96 @ 05:30:00

RCM7 S/N: 11562 (IGM)
 Battery condition: 6.67 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/26/96 @ 05:30:00

RCM7 S/N: 11198 (IGM)
 Battery condition: 6.67 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/26/96 @ 05:30:00

Fairy Mooring Hardware Statistics:

Top float with ADCP	=	1.1 m
Top McLane 78G-13 trap and transmissometer w/ pendant S/N 2243 (-77 lbs./-35 kg)	=	5.1 m
-Above top of cone = 2.7 m, below top of cone = 2.4 m		
Top SBE SeaCat 16-04 CT unit S/N 167881-1434 (-32 lbs./-14.55 kg)	=	0.84 m
Top Aanderaa RCM7 current meter S/N 12032 (-50 lbs./22.73 kg)	=	0.52 m
Middle 2 Resinex buoys with 2 Benthos floats (+320 lbs./+145.45 kg)	=	2.36 m
Bottom SBE SeaCat 16 CTD unit S/N 167881-2082 (-32 lbs./-14.55 kg)	=	0.84 m
Middle Aanderaa RCM7 current meter S/N 11562 (-50 lbs./-22.73 kg)	=	0.52 m
Bottom Tucci 24 cup sediment trap (-80 lbs./-36.4 kg)	=	3.5 m
-Above top of cone = 1.0 m, below top of cone = 2.5 m		
Bottom 5 Benthos floats (+250 lbs./+113.6 kg)	=	2.16 m
Bottom Aanderaa RCM7 current meter S/N 11198 (-50 lbs./-22.73 kg)	=	0.52 m
Dual EdgeTech 8202 acoustic release S/N17091 & 17092 (160 lbs/72.7 kg)	=	1.14 m
Stainless steel 12 mm wire rope	=	11.0 m
Anchor (-1800 lb./-818.2 kg)	=	1 m

All rope is: 464- Meters 10 mm 2-1 Kevlar rope with 9 mm nylon thimbles and 11 mm Duron rope.
 Hardware: 25- 1/2" stainless steel anchor shackles
 4- 5/8" galvanized anchor shackles
 10- 1/2" galvanized anchor shackles
 12- 12 mm stainless steel quick links
 01- 12 mm stainless steel wire rope, 11 meters long
 02- EdgeTech release links
 01- 1/2" galvanized pear master link

EdgeTech 8202 Release Command Codes for *Mooring Fairy* (IGM):

S/N 17091		S/N 170192	
Command A (Release)	535420	Command A (Release)	535445
Command B (Disable A)	560272	Command B (Disable A)	560345
Command C (Enable A & B)	560303	Command C (Enable A & B)	560366
Command D (Disable B)	560320	Command D (Disable B)	560401

New Mooring Location:	77° 58.294'S 178° 02.274'W
Water Depth:	698 meters
Date/Time (GMT)	12/26/96 @ 0745

**JOINT US/ITALIAN MOORING A' (NOW MOORING ADELIE) RECOVERY STATISTICS:
(December 29, 1996 @ 0100 GMT)**

Information on the mooring equipment for *Mooring A'*. The mooring recovery was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). The release and recovery of the mooring was done from the ship. A Zodiac was not launched to assist with the recovery effort. There were some difficulties with the mooring recovery. The main one was trying to grab the top buoy from the fantail of the NBP. A pole with a quick click connector at the end would have been very useful. One will be fabricated and brought along for the next cruise. There was also difficulty communicating with the InterOcean 1090ED acoustic releases from the NBP. Eventually good communications were established and the mooring released. Otherwise, the mooring recovery went very well. Below is a detailed outline of the recovery effort.

Released mooring from ship @	1400L/(0100Z 12/29/96)
Top 30" Billings steel buoy on deck @	1435
Top OSU Tracer15 sediment trap on deck @	1437
Top SBE SeaCat 16 CTD unit on deck @	1455
Top Aanderaa RCM8 w/ transmissometer on deck @	1455
Single 3 pack Billings float on deck @	1505
Four 3 pack Billings floats on deck @	1515
Bottom OSU Tracer15 sediment trap on deck @	1520
Bottom SBE SeaCat 16-04 CT unit on deck @	1530
Bottom Aanderaa RCM8 w/ transmissometer on deck @	1530
Bottom single 3 pack Billings float on deck @	1534
Dual InterOcean 1090ED acoustic releases on deck @	1535L(0235Z 12/29/96)

InterOcean 1090ED Release Command Codes *Mooring A'*:

S/N 0652600 (TOP)		S/N 0828007 (BOTTOM)	
Release command	ABEG	Release command	BEFH
Enable command	CDE	Enable command	DEF
Rearm command	CDEH	Rearm command	DEFH

Mooring A' Location:	76° 41.025'S 169° 00.23'E
Water Depth:	817 meters
Date/Time (GMT)	12/29/96 @ 0235

Results of the mooring instrumentation and servicing.

The top OSU Tracer15 sediment trap failed again for the 3rd year in a row stopping at cup 5. Since there was already 2 OSU Tracer15 sediment traps staged for deployment time was well spent in locating the problems associated with the sediment trap failures. Close inspection and repeated testing revealed a wire break in the motor electronics and an alignment problem with the carousel. Both problems were addressed and the sediment trap put through mock deployment tests three times without failure. In addition to the top trap failure, the bottom Aanderaa RCM8 and both top and bottom transmissometers failed. On the up side, the bottom Tracer15 sediment trap, top Aanderaa RCM8 and both SBE SeaCat 16 (CTD) and 16-04 (CT) units worked perfectly. The two InterOcean 1090ED acoustic releases worked well. The top acoustic release was low on battery power (only has 2 lithium batteries unlike the other which has 6 lithium batteries), but was still able to release. All floats, line, and mooring hardware were in good condition.

The download of data and instrument preparation were handled by IGM and Rice. The mooring was redesigned, adding an additional InterOcean S4 current meter at 62 mbsl with two supporting 3 packs of Billings floats above the S4 (one was a new pack and the other was acquired from the bottom of the mooring). The bottom single 3 pack Billing's float was removed and relocated to the top, the middle

single Billings float was relocated to make a five 3 pack Billing's float package. Also more mooring line was added to move the bottom trap from 38 to 51 masf. The upper RCM8 with transmissometer and top SeaCat CTD were redeployed in the reverse order. The bottom RCM8 current meter with transmissometer could not be repaired/service in time for the redeployment so they were removed and replaced with a RCM7. Original *Mooring A* was renamed as *Mooring Adelle* and is still a joint Italian/US mooring.

OSU Tracer15 Trap Recovery Performance: **(TOP) Sediment traps redeployed on Mooring Chinstrap.**

Trap Cups Expected/Recovered: 13/5 (Trap stopped at cup 5)
 Recovery Filename: A-REC96.TOP (Appendix B)
 TattleTale Interface Serial Number: 1319-6
 Battery Condition: 2.257 VDC (3-Micro 9v alkaline)
 2.961 VDC (1-RAM 3v lithium)
 18.37 VDC (4-Motor 9v alkaline)
 Sample cup preservative: 6% Na-borate formaline solution with filtered sea water.
 Sediment Trap Sampling: Samples transferred into 500 ml Nalgene Bottles. Cup #5 frozen at 80°C.
 Trap History: As follows:

*** DATA RECOVERY ENTRY INFORMATION FROM TOP TATTLE TALE ***

CUP	EVENT	DATE	TIME	TURN	MOTOR	LOGIC	ROT	TEMP
1	0	1/22/96	01:08:00	-	18.23	9.21	-	-
2	1	1/31/96	23:55:03	24.1	34.45	-12.-70	133	6552.0
3	2	2/14/96	23:59:43	25.1	34.30	-10.-80	43	6551.9
4	3	2/29/96	23:58:00	25.3	33.90	-16.-50	306	6551.9
INVALID DATA FOR EVENT 4								
5	4	181/14/00	70:72:16	1.1	3242.95	4602.00	4302	204.8
INVALID DATA FOR EVENT 5								
6	5	0/18/00	0:92:192	3.7	841.35	365.50	0	24.6

OSU Tracer15 Trap Recovery Performance: **(BOTTOM) Sediment traps redeployed on Mooring Chinstrap.**

Trap Cups Expected/Recovered: 13/13
 Recovery Filename: A-REC96.BOT (Appendix B)
 TattleTale Interface Serial Number: 1320-2
 Battery Condition: 8.07 VDC (3-Micro 9v alkaline)
 3.202 VDC (1-RAM 3v lithium)
 17.69 VDC (4-Motor 9v alkaline)
 Sample cup preservative: 6% Na-borate formaline solution with filtered sea water.
 Sediment Trap Sampling: Samples transferred into 500 ml Nalgene bottles.
 Trap History: As follows

*** DATA RECOVERY ENTRY INFORMATION FROM BOTTOM TATTLE TALE ***

CUP	EVENT	DATE	TIME	TURN	MOTOR	LOGIC	ROT	TEMP
1	0	1/22/96	01:08:00	-	18.23	9.21	-	-

2	1	1/31/96	23:58:01	29.0	18.50	7.60	273	6551.8
3	2	2/14/96	23:54:14	29.4	18.60	7.50	3	6551.8
4	3	3/01/96	0:01:07	29.6	18.70	7.40	97	6551.8
5	4	3/14/96	23:57:20	29.4	18.55	7.40	190	6551.8
6	5	3/31/96	23:59:57	30.1	18.45	7.30	280	6551.8
7	6	4/30/96	23:56:11	30.4	18.40	7.20	14	6551.8
8	7	6/01/96	0:03:05	31.0	18.35	7.10	108	6551.8
9	8	7/31/96	23:57:12	31.6	18.15	7.00	198	6551.8
10	9	9/30/96	23:59:51	31.2	18.05	7.00	284	6551.8
11	10	11/07/96	0:02:30	31.1	18.15	7.00	18	6551.8
12	11	12/01/96	0:03:01	30.8	17.95	7.00	111	6551.8
13	12	12/16/96	0:01:23	33.4	17.85	7.00	198	6551.8
14	13	10/27/94	11:14:36	4.3	19.00	12.20	262	21.6
15	14	10/27/94	11:15:13	44.0	18.95	12.20	262	21.6

Acoustic Releases recovery information: TOP (Cindy) 2 pk 7.11 VDC
 BOTTOM (Luisa) 2 pk 7.11 VDC; 4 pk 7.28 VDC
 Battery Type: Electrochem 3.7v D-cell lithium

MOORING ADELIE (OLD MOORING A') DEPLOYMENT STATISTICS: (December 29, 1996 @ 1755 GMT)

Information on the mooring equipment for *Mooring Adelie*. The mooring deployment was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). Preparation of all equipment was a joint effort between Rice and IGM. There were some problems and difficulties preparing the mooring and individual instruments on this array. These are discussed above. A detailed outline on the deployment is listed below.

Top 2-3 pack Billing's floats in water @	0525L/(1625Z 12/29/96)
Top InterOcean S4 current meter in water @	0525
Middle 30" Steel Billing's buoy in water @	0540
Top OSU Tracer15 sediment trap in water @	0550
Top Aanderaa RCM8 w/ transmissometer in water @	0550
Top SBE 16 CTD unit in water @	0550
Bottom 5-3 pack Billing's floats in water @	0615
Bottom OSU Tracer15 sediment trap in water @	0648
Bottom SBE 16-04 CT unit in water @	0650
Bottom Aanderaa RCM7 in water @	0650
Dual InterOcean 1090ED acoustic releases in water @	0652
Anchor released @	0655L (1755Z 12/29/96)

OSU Tracer15 Sediment Trap Deployment Statistics: (TOP) Traps reconditioned at OSU.

Trap Cups Deployed:	15
Deployment Filename:	ADELIE96.TOP (Appendix C)
TattleTale Interface Serial Number:	1319-5
Battery Condition:	9.39 VDC (3-Micro 9v alkaline) 3.259 VDC (1-RAM 3v lithium) 18.86 VDC (4-Motor 9v alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.
Trap deployment program:	Same as Bottom trap, see below

OSU Tracer15 Sediment Trap Deployment Statistics: (BOTTOM) Traps reconditioned at OSU.

Trap Cups Programmed: 15
Recovery Filename: ADELIE96.BOT (Appendix C)
TattleTale Interface Serial Number: 1328-9
Battery Condition: 9.28 VDC (3-Micro 9v alkaline)
2.967 VDC (1-RAM 3v lithium)
18.80 VDC (4-Motor 9v alkaline)
Tests performed: Motor - OK; Interface - OK
Sample cup preservative: 6% Na-borate formaline solution with filtered sea water.
Trap deployment program: Same as Top and as follows

Mooring Adelle Top and Bottom Sediment Trap Deployment date- 29 December 1996 at 1755 GMT, and Programming. OSU Tracer15 Sediment Traps trap begin and end with a cup (#1 & #15) under funnel.

OSU Tracer15 sediment trap program:

Duration	GMT Time	GMT Date	Event #	Cup#
18 Days	1755	29 December 1996	Event 0	Cup 1
16 Days	0600	16 January 1997	Event 1	Cup 2
14 Days	0600	01 February 1997	Event 2	Cup 3
14 Days	0600	15 February 1997	Event 3	Cup 4
14 Days	0600	01 March 1997	Event 4	Cup 5
17 Days	0600	15 March 1997	Event 5	Cup 6
44 Days	0600	01 April 1997	Event 6	Cup 7
61 Days	0600	15 May 1997	Event 7	Cup 8
62 Days	0600	15 July 1997	Event 8	Cup 9
47 Days	0600	15 September 1997	Event 9	Cup 10
14 Days	0600	01 November 1997	Event 10	Cup 11
16 Days	0600	15 November 1997	Event 11	Cup 12
14 Days	0600	01 December 1997	Event 12	Cup 13
17 Days	0600	15 December 1997	Event 13	Cup 14
? Days	0600	01 January 1998	Event 14	Cup 15

SeaBird SeaCat 16 and 16-04 CT units:

TOP SBE 16 S/N: 1506 (IGM)
Battery condition: 8.6 VDC (6 alkaline D-cells)
Memory battery: 5.4 VDC (lithium)
Sampling interval: 1800 seconds (30 minutes)
GMT Start: 12/29/96 @ 06:00:00

BOTTOM SBE 16-04 S/N: 1507 (IGM)
Battery condition: 8.9 VDC (6 alkaline D-cells)
Memory battery: 5.6 VDC (lithium)
Sampling interval: 1800 seconds (30 minutes)
GMT Start: 12/22/96 @ 20:30:00

Aanderaa RCM7 and RCM8 current meters:

RCM8 w/ transmissometer S/N: 11162 (IGM) TOP
Battery condition: 6.82 VDC (Type 3382 lithium)
Sampling interval: 30 minutes

GMT Start: 12/29/96 @ 11:01:00

RCM7 S/N: 11199 (IGM) BOTTOM
 Battery condition: 6.83 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/29/96 @ 12:30:00

InterOcean S4 current meters:

#1 S4 S/N: 08291860
 Battery condition: 7.67 VDC (6 lithium D-cells)
 Sampling interval: 1minute every 15 minutes
 GMT Start: 12/29/96 @ 11:00:00

InterOcean 1090ED acoustic releases:

Acoustic Releases: S/N 0652600 (Cindy) 2 pk 7.88 VDC (TOP)
 S/N 0828007 (Luisa) 2 pk 7.49VDC; 4 pk 7.52 VDC (BOTTOM)
 Battery Type: Electrochem 3.7 VDC D-cell lithium

Adelie Mooring Hardware Statistics:

Two 3 pack floats	=	1 m
Top InterOcean S4 current meter S/N 08291860 (-4 lbs./-1.82 kg)	=	0.46 m
Top 30" steel float (+369 lbs./-167.73 kg)	=	0.762 m
Top OSU Tracer15 w/ pendant S/N 1319-5 (-60 lbs./-27.3 kg)	=	25.0 m
-Above top of cone = 21.5 m, below top of cone 3.5 m		
Top Aanderaa RCM8 current meter w/ transmissometer S/N 11162 (-50 lbs./22.73 kg)	=	0.52 m
Top SBE SeaCat 16 CTD unit S/N 1506 (-32 lbs./-14.55 kg)	=	0.84 m
Five 3 pack floats (+330 lbs./150 kg)	=	2.5 m
Bottom OSU Tracer15 w/ pendant S/N 1319-5 (-60 lbs./-27.3 kg)	=	25.0 m
-Above top of cone = 21.5 m, below top of cone 3.5 m		
Bottom SBE SeaCat 16-04 CT unit S/N 1507 (-32 lbs./-14.55 kg)	=	0.84 m
Bottom Aanderaa RCM7 S/N 11199 (-50 lbs./22.73 kg)	=	0.52 m
Top InterOcean 1090ED acoustic release S/N0652600 (-20 lbs/9.1 kg)	=	0.62 m
Bottom InterOcean 1090ED acoustic release S/N0828007 (-20 lbs/9.1 kg)	=	0.62 m
Galvanized 1/2" anchor chain	=	3.0 m
Anchor 1800 lb./818.2 kg	=	1 m

All rope is: 687- Meters 11 mm single braid Duron w/ 1/2" nylon thimbles

Hardware:

- 10- 1/2" galvanized chain shackles (floats)
- 5- 1/2" stainless steel anchor shackles
- 3- 5/8" galvanized anchor shackles
- 01- 5/8" Stainless steel eye and jaw swivel
- 04- 3/8" stainless steel chain shackles (CTD meters)
- 01- 1/2" galvanized chain, 3 meters long
- 02- 5/8" stainless steel sediment trap shackle
- 04- 5/8" stainless steel shackle
- 01- 1" galvanized shackle
- 01- 1" stainless steel shackle
- 02- 1" InterOcean acoustic release bushings

InterOcean 1090ED Release Command Codes *Mooring A*:

S/N 0652600 (TOP)

Release command **ABEG**
Enable command **CDE**
Rearm command **CDEH**

S/N 0828007 (BOTTOM)

Release command **BEFH**
Enable command **DEF**
Rearm command **DEFH**

Mooring Adelle Location:

76° 41.084'S 168° 59.208'E

Water Depth:

819 meters

Date/Time (GMT)

12/29/96 @ 1755

MOORING CHINSTRAP DEPLOYMENT STATISTICS: (December 31, 1996 @ 1135 GMT)

Information on the mooring equipment for *Mooring Chinstrap*. The mooring deployment was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). Preparation of all equipment was a joint effort between Rice and IGM. The SeaBird SeaCat 16-04 CT units and Aanderaa RCM8 and RCM9 current meters (w/ pressure and conductivity sensors) were all new instruments. The Aanderaa RCM7 current meter is a loaner instrument to test the RCM9 and will be returned after the next recovery. There were some problems and difficulties preparing the mooring and individual instruments on this array. The Tracer15 sediment traps recovered from the old *Mooring A'* were repaired and serviced for deployment on *Mooring Chinstrap*. The details of the repairs and recovery statistics data are in the *Mooring A'* Recovery Statistics Section above. Two steel buoys were used on this mooring making the flotation arrangement on this mooring different than the other moorings. The steel floats were used due to the lack of glass flotation spheres and need to remain above their crush depth threshold. This flotation arrangement created a large gap (500 m) between the bottom flotation package and the bottom interments. A detailed outline on the deployment is listed below.

Top 2-3 pack Billing's floats in water @	2325L/(1025Z 12/31/96)
Top InterOcean S4 current meter in water @	2325
Middle 30" Steel Billing's buoy in water @	2340
Top OSU Tracer15 sediment trap in water @	2350
Top Aanderaa RCM9 current meter w/ P and C sensors in water @	2354
Top Aanderaa RCM7 in water @	2354
Top SBE 16-04 CT unit in water @	2355
Bottom 30" Steel Billing's buoy w/ 1-3 packs Billing's floats in water @	0005
Bottom OSU Tracer15 sediment trap in water @	0025
Bottom SBE 16-04 CT unit in water @	0030
Bottom Aanderaa RCM8 w/ P and C sensors in water @	0030
EdgeTech 8202 dual channel acoustic release in water @	0035
Anchor released @	0042L (1125Z 12/31/96)

OSU Tracer15 Sediment Trap Deployment Statistics: (TOP) Traps previously deployed on Mooring A'.

Trap Cups Deployed:	15
Deployment Filename:	CHIN96.TOP (Appendix C)
TattleTale Interface Serial Number:	1330-11 (new TT interface)
Battery Condition:	9.30 VDC (3-Micro 9v alkaline) 3.004 VDC (1-RAM 3v lithium) 18.81 VDC (4-Motor 9v alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.
Trap deployment program:	Same as Bottom trap, see below

OSU Tracer15 Sediment Trap Deployment Statistics: (BOTTOM) Traps previously deployed on Mooring A'.

Trap Cups Programmed:	15
Recovery Filename:	CHIN96.BOT (Appendix C)
TattleTale Interface Serial Number:	1320-2
Battery Condition:	9.20 VDC (3-Micro 9v alkaline) 3.201 VDC (1-RAM 3v lithium) 18.77 VDC (4-Motor 9v alkaline)
Tests performed:	Motor - OK; Interface - OK

Sample cup preservative: 6% Na-borate formaline solution with filtered sea water.
 Trap deployment program: Same as Top and as follows

Mooring Chinstrap Top and Bottom Sediment Trap Deployment date- 31 December 1996 at 1135 GMT, and Programming. OSU Tracer15 Sediment Traps trap begin and end with a cup (#1 & #15) under funnel.

OSU Tracer15 sediment trap program:

Duration	GMT Time	GMT Date		Event #	Cup#
16 Days	1135	31 December	1996	Event 0	Cup 1
16 Days	0600	16 January	1997	Event 1	Cup 2
14 Days	0600	01 February	1997	Event 2	Cup 3
14 Days	0600	15 February	1997	Event 3	Cup 4
14 Days	0600	01 March	1997	Event 4	Cup 5
17 Days	0600	15 March	1997	Event 5	Cup 6
44 Days	0600	01 April	1997	Event 6	Cup 7
61 Days	0600	15 May	1997	Event 7	Cup 8
62 Days	0600	15 July	1997	Event 8	Cup 9
47 Days	0600	15 September	1997	Event 9	Cup 10
14 Days	0600	01 November	1997	Event 10	Cup 11
16 Days	0600	15 November	1997	Event 11	Cup 12
14 Days	0600	01 December	1997	Event 12	Cup 13
31 Days	0600	15 December	1997	Event 13	Cup 14
? Days	0600	15 January	1998	Event 14	Cup 15

SeaBird SeaCat 16-04 CT units:

TOP SBE 16-04 S/N: 1615016-2258
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Memory battery: 5.6 VDC (lithium)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/31/96 @ 03:30:00

BOTTOM SBE 16-04 S/N: 1615016-2099
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Memory battery: 5.6 VDC (lithium)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 12/31/96 @ 03:30:00

Aanderaa RCM7 and RCM8 current meter:

RCM9 w/ P and C sensors S/N: 70 TOP
 Battery condition: 9.13 VDC (Type 3614 alkaline)
 Sampling interval: 30 minutes
 GMT Start: 12/31/96 @ 05:00:00

RCM7 S/N: 11548 MIDDLE
 Battery condition: 6.73 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 12/31/96 @ 05:00:00

RCM8 w/ P and C sensors S/N: 12120 TOP
 Battery condition: 6.86 VDC (Type 3382 lithium)

Sampling interval: 30 minutes
GMT Start: 12/31/96 @ 05:00:00

InterOcean S4 current meters:

#1 S4 S/N: 07801666
Battery condition: 7.88 VDC (6 lithium D-cells)
Sampling interval: 1minute every 15 minutes
GMT Start: 12/31/96 @ 00:30:00

Chinstrap Mooring Hardware Statistics:

Two 3 pack floats	=	1 m
Top InterOcean S4 current meter S/N 07801666 (-4 lbs./-1.82 kg)	=	0.46 m
Top 30" steel float (+369 lbs./-167.73 kg)	=	0.762 m
Top OSU Tracer15 w/ pendant S/N 1330-11 (-60 lbs./-27.3 kg)	=	25.0 m
-Above top of cone = 21.5 m, below top of cone 3.5 m		
Top Aanderaa RCM9 current meter w/ P and C sensors S/N 70 (-27 lbs./12.3 kg)	=	0.51 m
Middle Aanderaa RCM7 current meter S/N 11548 (-42 lbs./19.1 kg)	=	0.5 m
Top SBE SeaCat 16 CTD unit S/N 1615016-2258 (-32 lbs./-14.55 kg)	=	0.84 m
Five 3 pack floats (+330 lbs./150 kg)	=	2.5 m
Bottom OSU Tracer15 w/ pendant S/N 1320-2 (-60 lbs./-27.3 kg)	=	25.0 m
-Above top of cone = 21.5 m, below top of cone 3.5 m		
Bottom SBE SeaCat 16-04 CT unit S/N 1615016-2099 (-32 lbs./-14.55 kg)	=	0.84 m
Bottom Aanderaa RCM8 w/ P and C sensors S/N 12120 (-50 lbs./22.73 kg)	=	0.52 m
EdgeTech 8202 dual channel acoustic release S/N 021618 (-75 lbs/34.1 kg)	=	0.62 m
Galvanized 1/2" anchor chain	=	3.0 m
Anchor 1800 lb./818.2 kg	=	1 m

All rope is: 701- Meters 11 mm single braid Duron w/ 1/2" nylon thimbles
Hardware: 07- 1/2" galvanized chain shackles (floats)
07- 1/2" stainless steel anchor shackles
08- 5/8" galvanized anchor shackles
01- 5/8" galvanized eye and eye swivel
04- 3/8" stainless steel chain shackles (CTD meters)
01- 1/2" galvanized chain, 3 meters long
02- 5/8" stainless steel sediment trap shackle
02- 5/8" stainless steel shackle
01- EdgeTech release link

EdgeTech 8202 Release Command Codes for *Mooring Chinstrap*:

S/N 021618	
Command A (Release)	626654
Command B (Disable A)	610540
Command C (Enable A & B)	610563
Command D (Disable B)	610601

New Mooring Location: 76° 20.400'S 165° 03.220'E
Water Depth: 825 meters
Date/Time (GMT) 12/32/96 @ 1135

MOORING EMPEROR DEPLOYMENT STATISTICS: (January 07, 1997 @ 1135 GMT)

Information on the mooring equipment for *Mooring Emperor*. The mooring deployment was supervised by David Mucciarone (S-216A) and performed on the RVIB N.B Palmer (Fig. 3). Preparation of all equipment was a joint effort between Rice and IGM. The RDI ADCP unit, EdgeTech acoustic release, McLane 78G-13 sediment trap, two SeaBird SeaCat 16-04 CT units, and three Aanderaa RCM8 current meters (w/ pressure and conductivity sensors) were all new instruments. There were no problems or difficulties preparing the mooring and individual instruments on this array. A detailed outline on the deployment is listed below.

Top 2-3 pack Billing's floats in water @	2325L/(1025Z 12/31/96)
Top Aanderaa RCM8 w/ P and C sensors in water @	0030
Top InterOcean S4 current meter in water @	2325
RDI ADCP w/ Syntactic foam float in water @	2340
Middle Aanderaa RCM8 w/ P and C sensors in water @	0030
Top SBE 16-04 CT unit in water @	2355
Lower InterOcean S4 current meter in water @	2325
Bottom flotation package, 5-3 pack Billing's floats in water @	0005
Bottom McLane 78G-13 sediment trap in water @	0025
Bottom SBE 16-04 CT unit in water @	0030
Bottom Aanderaa RCM8 w/ P and C sensors in water @	0030
EdgeTech 8202 dual channel acoustic release in water @	0035
Anchor released @	0042L (1125Z 12/31/96)

McLane 78G-13 Sediment Trap Deployment Statistics: (BOTTOM)

Trap Cups Deployed:	13
Deployment Filename:	FAIRY96.TOP
TattleTale Interface Serial Number:	2244
Battery Condition:	9.58 VDC (1-Micro 9v alkaline) 21.2 VDC (14-Motor C-cell alkaline)
Tests performed:	Motor - OK; Interface - OK
Sample cup preservative:	6% Na-borate formaline solution with filtered sea water.

Mooring Emperor Top and Bottom Sediment Trap Deployment date- 26 December 1996 at 0736 GMT, and Programming. The McLane 78G-13 Trap begin and end at an open hole under funnel.

McLane 78G-13 sediment trap program:

<u>Duration</u>	<u>GMT Time</u>	<u>GMT Date</u>	<u>Event #</u>	<u>Cup#</u>
--- Days	0736	26 December 1996	Event 0	Open
21 Days	1400	26 December 1996	Event 1	Cup 1
16 Days	0600	16 January 1997	Event 2	Cup 2
14 Days	0600	01 February 1997	Event 3	Cup 3
14 Days	0600	15 February 1997	Event 4	Cup 4
14 Days	0600	01 March 1997	Event 5	Cup 5
17 Days	0600	15 March 1997	Event 6	Cup 6
44 Days	0600	01 April 1997	Event 7	Cup 7
61 Days	0600	15 May 1997	Event 8	Cup 8
62 Days	0600	15 July 1997	Event 9	Cup 9
47 Days	0600	15 September 1997	Event 10	Cup 10
24 Days	0600	01 November 1997	Event 11	Cup 11
25 Days	0600	25 November 1997	Event 12	Cup 12

43 Days	0600	01 December	1997	Event 13	Cup 13
	0600	01 February	1998	Event 14	Open

RDI Broadband ADCP:

BBADCP 150KHz transducer S/N:	2562
BBACCP canister (pressure case) S/N:	1510
Battery pack assembly (alkaline) S/N:	ABPM (includes 19 alkaline C cells)
Alkaline battery packs S/N:	ABP-R (19 C cells/pk, 6 pks/unit)

SeaBird SeaCat 16-04 CT units:

TOP SBE 16-04 S/N:	1615016-2096
Battery condition:	8.8 VDC (6 alkaline D-cells)
Memory battery:	5.6 VDC (lithium)
Sampling interval:	1800 seconds (30 minutes)
GMT Start:	01/07/97 @ 03:30:00

BOTTOM SBE 16-04 S/N:	1615016-2259
Battery condition:	8.8 VDC (6 alkaline D-cells)
Memory battery:	5.6 VDC (lithium)
Sampling interval:	1800 seconds (30 minutes)
GMT Start:	01/07/97 @ 03:30:00

Aanderaa RCM8 current meters:

RCM8 w/ P and C sensors S/N:	12117 TOP
Battery condition:	6.86 VDC (Type 3382 lithium)
Sampling interval:	30 minutes
GMT Start:	01/07/97 @ 05:00:00

RCM8 w/ P and C sensors S/N:	12119 MIDDLE
Battery condition:	6.86 VDC (Type 3382 lithium)
Sampling interval:	30 minutes
GMT Start:	01/07.97 @ 05:00:00

RCM8 w/ P and C sensors S/N:	12121 TOP
Battery condition:	6.86 VDC (Type 3382 lithium)
Sampling interval:	30 minutes
GMT Start:	01/07/97 @ 05:00:00

InterOcean S4 current meters:

#1 S4 (Upper)S/N:	07801664
Battery condition:	7.88 VDC (6 lithium D-cells)
Sampling interval:	1 minute every 15 minutes
GMT Start:	01/07/97 @ 00:30:00

#2 S4 (Lower) S/N:	08291862
Battery condition:	7.88 VDC (6 lithium D-cells)
Sampling interval:	1 minute every 15 minutes
GMT Start:	01/07/97 @ 00:30:00

Emperor Mooring Hardware Statistics:

Two 3 pack floats	=	1 m
Top Aanderaa RCM8 w/ P and C sensors S/N 12117 (-50 lbs./22.73 kg)	=	0.52 m
Top InterOcean S4 current meter S/N 07801664 (-4 lbs./-1.82 kg)	=	0.46 m
Top syntactic foam buoy w/ RDI ADCP S/N: 2562/1510 (+700 lbs./+318.2 kg)	=	7.65 m
-Above buoy = 4.85 m; below buoy = 1.7 m; buoy = 1.1		
Middle Aanderaa RCM8 w/ P and C sensors S/N 12119 (-50 lbs./22.73 kg)	=	0.52 m
Top SBE SeaCat 16 CTD unit S/N 1615016-2096 (-32 lbs./-14.55 kg)	=	0.84 m
Lower InterOcean S4 current meter S/N 08291862 (-4 lbs./-1.82 kg)	=	0.46 m
Five 3 pack floats (+330 lbs./150 kg)	=	2.5 m
Bottom McLane 78G-13 trap w/ pendant S/N 2244 (-77 lbs./-35 kg)	=	5.1 m
-Above top of cone = 2.7 m, below top of cone = 2.4 m		
Bottom SBE SeaCat 16-04 CT unit S/N 1615016-2259 (-32 lbs./-14.55 kg)	=	0.84 m
Bottom Aanderaa RCM8 w/ P and C sensors S/N 12121 (-50 lbs./-22.73 kg)	=	0.52 m
EdgeTech 8202 dual channel acoustic release S/N 020898 (-75 lbs./-34.1 kg)	=	0.62 m
Galvanized 1/2" anchor chain	=	3.0 m
Anchor 1800 lb./818.2 kg	=	1 m

All rope is: 603- Meters 11 mm single braid Duron w/ 1/2" nylon thimbles

Hardware:

- 07- 1/2" galvanized chain shackles (floats)
- 07- 1/2" stainless steel anchor shackles
- 08- 5/8" galvanized anchor shackles
- 01- 5/8" galvanized eye and eye swivel
- 04- 3/8" stainless steel chain shackles (CTD meters)
- 01- 1/2" galvanized chain, 3 meters long
- 02- 5/8" stainless steel sediment trap shackle
- 02- 5/8" stainless steel shackle
- 01- EdgeTech release link

EdgeTech 8202 Release Command Codes for *Mooring Emperor*:

S/N 021618	
Command A (Release)	626654
Command B (Disable A)	610540
Command C (Enable A & B)	610563
Command D (Disable B)	610601

New Mooring Location:	76° 58.912'S 171° 58.745'E
Water Depth:	675 meters
Date/Time (GMT)	01/07/97 @ 0755