

DF-99 ANTARCTIC PENINSULA
SEDIMENT TRAP DEPLOYMENT AND WATER CHEMISTRY CRUISE
R/V N.B. PALMER (MAR 28, 1999 to APR. 12, 1999)

by

David A. Mucciarone

S-072 Cruise Participant: Robert B. Dunbar and David A. Mucciarone from Stanford University

Travel Logistics:

Departed San Francisco (SFO) at 1405 on 3/22/99 on UA Flt#:733 and arrived in Miami (MIA) at 2206. Departed MIA on UA Flt#:997 at 2330 and arrived in Santiago (SCL) at 0825 on 3/23/99. Departed SCL on LA Flt#:85 at 1100 on 3/23/99 and arrived in Punta Arenas (PUQ), Chile at 1510 on 3/23/99. We met with AGUNSA for clothing issue at 1600.

We boarded the NBP at 0900 on 3/27/99. A majority of the day was spent varifying cargo and supplies, staging and setting up equipment, and meetings. At 0600 on 3/28/99 the NBP departed the dock in Punta Arenas for the Antarctic Peninsula. The last station on the cruise ended at 0030 on 4/8/99, departing for Punta Arenas shortly after the jumbo piston coring equipment was secured.

We arrived in Punta Arenas at 1100 on 4/11/99. We departed PUQ at 1255 on 4/12/99 on UC Flt#:280 and arrived in SCL at 1700. Departed SCL on UA Flt#:996 at 2005 and arrived in MIA at 0437 on 4/13/99. Departed MIA on UA Flt#:732 at 0710 and arrived in SFO at 1010 on 4/13/99.

Summary of Field Operations:

Co-chief Scientist for cruise 99-02 Eugene Domack and Amy Leventer. The cruise began on 3/28/99 at 0600 from Punta Arenas. Cruise 99-02 lasted 14 days, consisted of 29 stations and one mooring deployment. The cruise on the RVIB N.B. Palmer ended in Punta Arenas at 0600L on 4/11/99. Refer to Figure 1 for a map of the cruise track.

The areas of interest for this cruise were Andvord Bay/Paridise Harbor (Fig. 2), Palmer Deep (Fig. 2), and Lallemand Fjord/Crystal Sound (Fig. 3). Cruise objectives included collecting water for POC, PON, nitrate $\delta^{15}\text{N}$, and TDIC while underway and by hydrocast. In addition, subsample Kastin cores and sample them for interstitial water for TDIC and the sediments for organic $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$. Our final objective was to deploy a mooring in the Palmer Deep. We also assisted in the recovery of three sediment trap moorings each consisting of 4 sediment taps. I also assisted with ping editing SeaBeam data. See Figures 4 and 5 for an example of the SeaBeam data from Palmer Deep.

RVIB N.B. Palmer 99-02 Cruise:

We recovered 3 small sediment trap mooring in Lallemand Fjord for Asa Chong. These moorings were recovered by dragging because they were not equipped with accoustic releases. All moorings were recovered, two sediment trap samples were lost because the sediment traps were recovered inverted. We also deployed one sediment trap mooring in the Palmer Deep. This mooring was equipped with an ADCP, 3 current meters, 2 CT units, 2 sediment traps, and 2 acoustic releases.

A total of 107 udnderway filters were collected for POC and PON, 68 bottles for TDIC, and 60 bottles for nitrate $\delta^{15}\text{N}$. Three hydrocasts (Stations 2, 5, and 18) were taken and sampled

for POC, PON, TDIC and for nitrate $\delta^{15}\text{N}$. Four Kastin cores (KC-1, 2, 20, 21) were samples for pore fluids. The sediment for these intervals were dried at 60 °C and stored in centrifuge tubes.

Mooring Operation:

Mooring Palmer Deep (Deployment)

We deployed the *Palmer Deep* at 2311 GMT on 4/3/99. 64° 51.689'S 64° 12.340'W, water depth 1040 m (Bathy2000) (Fig. 2). The mooring is equipped with two McLane 78G-13 sediment trap at the top and bottom, three Aanderaa RCM8 current meters, two SeaBird Electronics (SBE) SeaCat 16-04 CT units, two EdgeTech 8202 acoustic release, seven 3 pack Billings floats, and one RDI ADCP in a 50" syntactic foam buoy. The mooring deployment went smoothly with two exceptions (1) we missed the drop point and need to drag the mooring array for approximately 1 hr to the correct location (i.e., water depth) and (2) a premature release of the anchor weight. The mooring location was imaged with the Bathy2000 and all components appear to be in the correct location in the water column. We will not know the extent of damage (if any) to the instruments until the mooring is recovered.

PALMER DEEP MOORING DEPLOYMENT STATISTICS: (Aprin 3, 1999 @ 2311 GMT)

Information on the mooring equipment deployed for *Palmer Deep*. The mooring deployment was supervised by David Mucciarone (S-072) and performed on the RVIB N.B Palmer (Fig. 1 in mooring deployment section). Preparation of all equipment was a joint effort between Rob Dunbar and David Mucciarone. There were no problems preparing the mooring and individual instruments on this array for deployment. A detailed outline on the deployment is listed below.

RDI ADCP w/ Syntactic foam float in water @	1715L/(1315Z 4/3/99)
Top McLane 78G-13 sediment trap in water @	1740
Top Aanderaa RCM8 current meter w/ P and T ^o sensors in @	1744
Top SBE 16-04 CT unit in water @	1745
Middle Aanderaa RCM8 current meter w/ P and T ^o sensors in @	1755
Middle float package, 7-3 pack Billings floats in at @	1800
Bottom McLane 78G-13 sediment trap in water @	1815
Bottom Aanderaa RCM8 current meter w/ P and T ^o sensors in @	1817
Top SBE 16-04 CT unit in water @	1838
Dual EdgeTech 8202 acoustic release in water @	1840
Anchor released @	1900L (2311Z 4/3/99)

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

Trap Cups Deployed:	13
Deployment Filename:	GENTOO96.TOP
TattleTale Interface Serial Number:	2243
Battery Condition:	9.40 VDC (1-Micro 9v alkaline) 21.1 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: 2244 with 4093 TT8
 Battery Condition: 9.41 VDC (1-Micro 9v alkaline)
 21.7 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- 3 April 1999 at 2311, 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	2311	03 April 1999	Event 0	Open
25 Days	0100	06 April 1999	Event 1	Cup 1
31 Days	0100	01 May 1999	Event 2	Cup 2
61 Days	0100	01 June 1999	Event 3	Cup 3
61 Days	0100	01 August 1999	Event 4	Cup 4
15 Days	0100	01 Ocotber 1999	Event 5	Cup 5
16 Days	0100	16 October 1999	Event 6	Cup 6
15 Days	0100	01 Novermber 1999	Event 7	Cup 7
15 Days	0100	16 Novermber 1999	Event 8	Cup 8
15 Days	0100	01 December 1999	Event 9	Cup 9
16 Days	0100	16 December 1999	Event 10	Cup 10
15 Days	0100	01 January 2000	Event 11	Cup 11
16 Days	0100	16 January 2000	Event 12	Cup 12
29 Days	0100	01 February 2000	Event 13	Cup 13
	0100	01 March 2000	Event 14	Open

SeaBird SeaCat 16-04 CT units:

TOP SBE S/N: 1615016-2259
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 4/3/99 @ 01:00:00

BOTTOM SBE S/N: 1615016-2260
 Battery condition: 8.8 VDC (6 alkaline D-cells)
 Sampling interval: 1800 seconds (30 minutes)
 GMT Start: 4/3/99 @ 01:00:00

Aanderaa RCM8 current meter:

RCM8 S/N: 12119
 Battery condition: 7.35 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 4/2/99 @ 17:00:00

RCM8 S/N: 12120
 Battery condition: 7.35 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 4/2/99 @ 17:00:00

RCM8 S/N: 12119
 Battery condition: 7.38 VDC (Type 3382 lithium)
 Sampling interval: 30 minutes
 GMT Start: 4/2/99 @ 17:00:00

RDI Broadband ADCP:

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

Palmer Deep Mooring Hardware Statistics:

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
 Top McLane 78G-13 trap 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 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 1615016-2259 (-32 lbs./-14.55 kg) = 0.84 m
 Middle Aanderaa RCM8 w/ P and C sensors S/N 12120 (-50 lbs./22.73 kg) = 0.52 m
 Seven Billings 3 pack floats (+462 lbs./150 kg) = 3.5 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 Aanderaa RCM8 w/ P and C sensors S/N 12121 (-50 lbs./-22.73 kg) = 0.52 m
 Bottom SBE SeaCat 16-04 CT unit S/N 1615016-2260 (-32 lbs./-14.55 kg) = 0.84 m
 Dual EdgeTech 8202 dual channel acoustic release S/N 020898 (-75 lbs./-34.1 kg)
 -and S/N 021618 (-75 lbs./-34.1 kg) = 0.62 m
 Galvanized 1/2" anchor chain = 3.0 m
 Anchor 2400 lb./1090.9 kg = 1 m

All rope is: 822- Meters 12 mm single braid Duron w/ 1/2" nylon thimbles
 Hardware: 08- 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- EdgeTech release link

EdgeTech 8202 Release Command Codes for *Palmer Deep Mooring*:

S/N 021618		S/N 020898	
Command A (Release)	626654	Command A (Release)	626133
Command B (Disable A)	610540	Command B (Disable A)	607134
Command C (Enable A & B)	610560	Command C (Enable A & B)	607134
Command D (Disable B)	610601	Command D (Disable B)	607172

New Mooring Location: 64° 51.689'S 64° 12.340'W
Water Depth: 1040 meters
Date/Time (GMT) 04/03/99 @ 2311

