Initiation of an Integrated Biogeochemical Flux and Hydrographic Program at Station W.

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In this final report we describe the successful completion of our Station W field program. As stated in our proposal, in order to address our objectives, a field program was designed to collect time-series particle samples by deploying a single intermediate mooring with 3 sediment traps at approximate depths of 1000m, 2000m and 2950m at Station W located on the Northwest Atlantic Margin (Table 1.)

Funding for our program was received November 1, 2003 and our team immediately went into action and successfully executed our field program which consisted of the set-up and testing of all equipment including sediment traps, acoustic releases, and deck unit transponders, and also the design, fabrication, and construction of mooring components, and finally the deployment and recovery of our intermediate mooring system at Station W.



Figure 1. The recovery of the 1000m sediment trap at Station W

We selected (3) Mark VII McLane sediment traps for the mooring deployment depth positions from our inventory. We choose the 13 cup trap with a pressure recorder to be deployed at the shallow trap position (998m) and (2) 21 cup traps for deployment at the deeper positions (2006m, 2968m). The 13 cup trap has a larger cup opening than the 21 cup traps so that anticipated larger particles at the shallow trap position can be collected. Also the pressure recorder on the shallow trap will document any tilting of the mooring due to high energy currents. All components of the sediment traps were power washed and rinsed with distilled water and wrapped in plastic to insure the cleanest possible environment. A total of 55 sediment trap samples were collected during the scheduled collecting time which started on 6/27/04 to 4/27/05.

The 2 acoustic releases were sent to Benthos Inc. to be checked over and to have all new O-rings installed. To our disappointment one of the releases needed extensive repair and needed a new transponder which resulted in unexpected costs. The Benthos Deck Unit transponders were also checked and tested.

Buoy Lab personnel Rick Trask, Stephen Murphy, Jack Reese, and Larry Costello assembled and fabricated our mooring components of floatation, wire rope, nylon rope, hardware and equipment for the deployment.

The deployment cruise was on the R/V Knorr with Lloyd Keigwin as chief scientist. On June 19, 2004 the sediment trap mooring was deployed by Larry Costello, Mike McCarthy and Daniel Montlucon at our proposed location and depth. The mooring was recovered from the R/V Endeavor on June 17, 2005 with Tim Eglinton as chief scientist. The sediment traps were successfully recovered (Fig. 1) and we recovered a total of 55 time-series

particle samples from all 3 sediment trap depths (Fig. 2) as planned. Also as stated in our objectives we have distributed samples for various analysis including (e.g., forams), molecular (e.g., alkenones), PCR amplification, 14C, and bulk chemical analysis of organic and inorganic carbon, opal, and lithogenic components. In addition and as planned, our samples have been collected synchronously with hydrographic data from John Toole's and co-PI's program "Investigating the characteristics and consequences of interannual variations in the Northwest Atlantic's Deep Western Boundary Current". With these data sets in hand, it will be possible to accurately link physical and biogeochemical ocean processes at station W.



Figure 2. A total of 55 time-series sediment trap particle samples collected at station W. The 13 bottles in the top row are from the 1000m trap, The 21 samples in the second row are from the 2000m trap and the 21 bottles in the bottom are from the deep trap.

On a final note, we are pleased to report that the interest in the OCCI Station W program has lead to additional funding through NSF (*Advective Controls on Organic Carbon Export and Burial on the Northwest Atlantic Margin*) where we plan to continue and expand our sample collection for an additional 3 years. Consequently our sediment trap mooring was redeployed and will be recovered again in June 2006.

	Mooring I.D.	Station W-OCCI				
	Water Depth	3000				
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Item #	Specifications	Item	Item	Mooring	Above	Below
	Description	Quantity	Length	Length	Bottom	Surface
		#	Item	(m)	mab	mbs
1 (FLOAT (3 Ball) with, RADIO, STROBE	1	1	1	2061	939
2	chain, 3/8"	1	5	6	2060	940
3	wire rope.3/16"	1	20	26	2055	945
4	GLASS BALLS 17"on 1m,3/8 chain	16	10	36	2035	965
5	nylon rope,3/4" alongside 24m wire rope	1	20	56	2025	975
6	chain, 3/8"	1	2	58		995
7	bridle (3-wire rope)	1	1	59	2003	997
8	SEDIMENT TRAP MK7	1	2	61	2002	998
9	bridle,(3-1m 3/8 chain)	1	1	62	2000	1000
10	chain, 3/8" with swivel	1	2	64	1999	1001
11	wire rope.3/16"	1	10	74	1997	1003
12	wire rope.3/16"	1	50	124	1987	1013
13	wire rope.3/16"	1	400	524	1937	1063
14	wire rope.3/16"	1	400	924		1463
15	wire rope.3/16"	1	50	974	1137	1863
16	wire rope.3/16"	1	50	1024		1913
17	GLASS BALLS 17"on 1m,3/8 chain	14	20	1044	1037	1963
18	nylon rope,3/4" alongside 24m wire rope	1	20	1064	1017	1983
19	chain, 3/8"	1	2	1066	997	2003
20	bridle (3-wire rope)	1	1	1067	995	2005
21	SEDIMENT TRAP MK7	1	2	1068	994	2006
22	bridle,(3-1m 3/8 chain)	1	1	1069	993	2007
23	chain, 3/8" with swivel	1	2	1071	992	2008
24	wire rope.3/16"	1	50	1121	990	2010
25	wire rope.3/16"	1	400	1521	940	2060
26	wire rope.3/16"	1	400	1921	540	2460
27	wire rope.3/16"	1	50	1971	140	2860
28	wire rope.3/16"	1	20	1991	90	2910
29	wire rope.3/16"	1	5	1996		2930
30	GLASS BALLS 17"on 1m,3/8 chain	10	10			
31	nylon rope,3/4"	1	20			
32	chain, 3/8"	1	2	2028		
33	bridle (3-1m wire rope)	1	1	2029		
34	SEDIMENT TRAP MK7	1	2			
35	bridle,(3-1m 3/8 chain)	1	1	2032		
36	chain, 3/8" with swivel	1	2	2034		2971
37	wire rope.3/16"	1	10			2973
38	chain, 3/8"	1	2	2046		2983
39	ACOUSTIC RELEASE (Benthos Tandem)	1	1	2047		
40	chain, 3/8"	1	2	2049		
41	nylon rope,3/4"	1	10			
42	chain, 3/8"	1	2		2	2998
43	ANCHOR	2800	0	2061	0	3000

Table 1. The Sediment Trap Mooring configuration for Station W OCCI program deployed on June 19, 2004 and recovered on June 17, 2005 in the NW Atlantic.