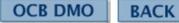
Ocean Carbon and Biogeochemistry Data System



EDDIES cruise: OCEANUS 415-4 Tracer 2 PI notes for Tracer Injection and Sampling Sled Data

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Tracer Injection Sled Description

The tracer injection sled for the EDDIES project lowered to the target potential density surface and then towed along that surface at 0.5 m/s while the tracer is injected. The sled is neutrally buoyant and is towed at the end of a 2-meter tether attached to the end of the CTD cable, which removes much of the ship motion. To follow lower frequency displacements of the target surface, the winch is controlled automatically with feedback from a SeaBird 911plus CTD system (Ledwell et al., 1998). The CTD has dual pumped C/T sensors mounted at the front of the sled to sample water not perturbed by the thermal wake of the sled. Also with the CTD was the same WET Labs fluorometer that had been used on Survey 1 on the Oceanus CTD/Rosette system. On the injection sled are also mounted injection orifices, pumps, batteries, fluid reservoirs, and control electronics for the injection. No injection sled data were reported for this cruise.

Sampling Sled Description

The sampling sled is similar to the injection sled in that it carries the same SeaBird 9 CTD and the WET Labs fluorometer. It is mounted directly at the end of the CTD cable, with no tether, and with an array of integrating samplers above and below it (Ledwell et al. 1998). It is oriented into the flow with wedge-shaped panels on the aft end, and is also controlled to stay as near as possible to a target isopycnal surface.

Ledwell et al., 1998

Ledwell, J. R., A. J. Watson, and C. S. Law, Mixing of a tracer in the pycnocline, J. Geophys. Res., 103 (C10), pp. 21,499-21,529, 1998.

Sled Data Description

Data from the casts with the injection and sampling sleds are divided into downcast, flights along the target surface, and upcasts, indicated by "down", "flight" and "up" in the filenames, respectively.

Thirteen casts were done with the sampling sled on this cruise. Casts 5 and 12 were for calibration only. The others were all part of the tracer survey, and are labeled sampling tows 1 through 11. There are 13 sampler casts, 001 through 013. Data from cast 1 are reported separately because the CTD unit was configured with two fluorometer sensors, a WET Labs ECO-AFL/FL and a Chelsea Instruments fluorometer. Chlorophyll-a estimates from the Chelsea fluorometer for the first scan reported from each downcast were set to 'nd', because the values were erroneously high (2600-3200).

The sled sampling events as reported in the cruise event log are:

<pre># cruise: OC415-4 EDDIES Tracer 2 #</pre>							
event	date	time	lon	lat	cast	ev_type	comments
200508310100	20050831	0100	-70.845	29.882	1	Sampler	Tow
200508311230	20050831	1230	-69.845	29.711	1	Sampler	End Tow
200509010100	20050901	0100	-70.784	29.791	2	Sampler	Tow
200509011200	20050901	1200	-70.518	29.727	2	Sampler	End Tow
200509020100	20050902	0100	-70.723	29.808	3	Sampler	Tow
200509021200	20050902	1200	-70.436	29.737	3	Sampler	End Tow
200509030100	20050903	0100	-70.720	29.726	4	Sampler	Tow
200509031200	20050903	1200	-70.425	29.614	4	Sampler	End Tow
200509040030	20050904	0030	-70.408	29.922	5/6	Sampler	Tow/Cast
200509041130	20050904	1130	-70.193	30.095	5/6	Sampler	End Tow
200509050130	20050905	0130	-70.578	29.735	7/6	Sampler	Tow/Cast
200509051200	20050905	1200	-70.289	29.685	7/6	Sampler	End Tow
200509060100	20050906	0100	-70.453	29.821	8/7	Sampler	Tow/Cast
200509061130	20050906	1130	-70.276	30.027	8/7	Sampler	End Tow
200509080230	20050908	0230	-70.453	29.821	9/8	Sampler	Tow/Cast
200509081330	20050908	1330	-70.276	30.027	9/8	Sampler	End Tow
200509090030	20050909	0030	-70.544	29.696	10/9	Sampler	Tow/Cast
200509091200	20050909	1200	-70.776	29.762	10/9	Sampler	End Tow

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EDDIES: methodology

200509100030	20050910	0030	-70.559	29.712	11/10	Sampler	Tow/Cast
200509101200	20050910	1200	-70.926	29.853	11/10	Sampler	End Tow
200509110100	20050911	0100	-70.181	29.875	11/12	Sampler	Tow/Cast
200509111230	20050911	1230	-70.421	29.722	11/12	Sampler	Recovery

The primary variables added to the database from the original SAM_00?_*.mat files are:

scan scan number

yearday time in decimal days, referenced to 0 at start of 2005

lat decimal degrees north

lon decimal degrees east (negative in our case)
temp0 temperature, primary sensor pair (T90, deg C))
temp1 temperature, secondary sensor pair (T90, deg C))

cond0 conductivity, primary sensor pair cond1 conductivity, secondary sensor pair

press pressure (dbar)

v0 Chelsea Instruments fluorometer voltage v5 Wetlabs fluorometer voltage (only for Cast 001) sampl Sampler status: 1=ON; 0=OFF (estimated)

and the derived variables are:

sal0 Salinity, primary sensor pair sal1 Salinity, secondary sensor pair

Wetl Chlorophyll from WetLabs fluorometer on Cast 1

Wetl = 3.5334*v5 - 0.3250, with v5 in volts

fluor_chla Chlorophyll from Chelsea Instruments fluorometer voltage, v0, (mg/m3):

inter-calibrated with the WetLabs fluorometer used on cast 1

Salinity Calibration

A few salinity samples were taken during the tows during OC415-4.

The mean values should be subtracted from sal0, and potential temperature and potential density should be recalculated accordingly.

Cruise	Name	No. of samples	Mean S - Autosal	Std. Dev.
OC415-4	Tracer 2	6	0.0040	0.0034

PI notes pertaining to the Seabird 911plus CTD unit

24 scans were averaged, so data were recorded at 1 hz. A correction for the thermal mass effect was made with coefficients: $a=0.027300,\ b=0.100000$



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