Cruise Report

Costa Rica Dome, FLUx and Zinc Experiments (CRD FLUZiE)
R/V MELVILLE, 22 June - 25 July 2010

Compiled and submitted by: Michael R. Landry, Chief Scientist
Scripps Institution of Oceanography, Univ. California, San Diego

Cruise ID: MV1008
Depart: 22 June 2010, Puerto Caldera, Costa Rica
27 June 2010, Puerto Caldera, personnel exchange
Return: 25 July 2010, Puerto Caldera, Costa Rica
Vessel: R/V MELVILLE
Operator: Scripps Institution of Oceanography
Master: Captain Christopher Curl
Chief Scientist: Michael R. Landry
Marine Technicians: Jim Dorrance, John Calderwood, Frank Delahoyde

Area of Operations: NP13 / Costa Rica Dome
Clearance Countries: Costa Rica (A), Nicaragua (A), Honduras (A)

Non-US Participants:
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Dr. Andrés Gutiérrez Rodríguez (Spain, postdoc at SIO)
Dr. Takafumi Kataoka (Japan, postdoc HKUST, Hong Kong)
Ms. Xi Chen (China, grad student at SUNY, Stony Brook)
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SCIENCE OBJECTIVES

Research on the cruise was aimed at acquiring a better understanding of plankton dynamics, carbon and nutrient fluxes, and potential trace element limitation in the Costa Rica Dome region of the eastern tropical Pacific. The specific science objectives were: 1) to assess grazing and trace metal/nutrient controls on primary production and phytoplankton standing stocks; 2) to quantify carbon and elemental fluxes and export rates from the euphotic zone; and 3) to measure microbial population, processes, stable isotope abundances associated with the OMZ and nitrite maxima. Operations included: 4-day sediment trap deployments, daily process experiments conducted on satellite-tracked drifters, CTD and trace-metal rosette sampling, shipboard grow-out experiments, net sampling for zooplankton biomass and grazing assessments, and MOCNESS stratified tows to 1000 m.

SAMPLING AND EXPERIMENTAL DESIGN

The two main elements of the cruise sampling design are depicted in Fig. 1. From 29 June to 3 July, we sampled a transect of stations (shown as CTD stations 12-19; Figs. 1 and 2) across the CRD from 6.5°N to 10°N, and an additional a cross-shaped pattern to locate the center of the dome upwelling region (CTD stations 20-24; Fig. 2). At each of these stations, we lowered a fast repetition rate fluorometer (FRRF) to 100 m, we collected zooplankton biomass samples with an oblique net tow to ~150-m depth (200-µm mesh, 1-m^2 ring net), we sampled the water column to 500 m with a CTD rosette system (hydrography, nutrients and phytoplankton), and we collected samples for trace metal analysis with a TM-clean rosette.

During the remainder (and majority) of the cruise, we conducted five quasi-Lagrangian experiments of typically 4-day duration following the paths of satellite tracked surface drifters. Each of these experiments, which we called “cycles”, involved a coordinated series of *in situ* sampling and shipboard experimental activities to measure changes in hydrography and the plankton community in the tracked water parcel, to determine process rates (production, growth, grazing and export) in incubation experiments, and to evaluate nutrient and trace metal limitation of the phytoplankton community. Export was assessed by the 234-Thorium method and by measured fluxes into sediment traps deployed below the euphotic zone on a second drifter array (deployed at the start of the cycle and recovered at the end). Process experiments were conducted daily using water collected on a pre-dawn CTD hydrocast at 8 depths from the top to the bottom of the euphotic zone. In situ experiments for ^{14}C-primary production, new production, net biogenic silica incorporation, and phytoplankton growth and microzooplankton grazing rates (dilution) were incubated in net bags attached at the depth of collection to a wire hanging below the drifter. Net tow samples were collected at midday and midnight for biomass and grazing assessments (gut fluorescence) of mesozooplankton, for depth profiles of

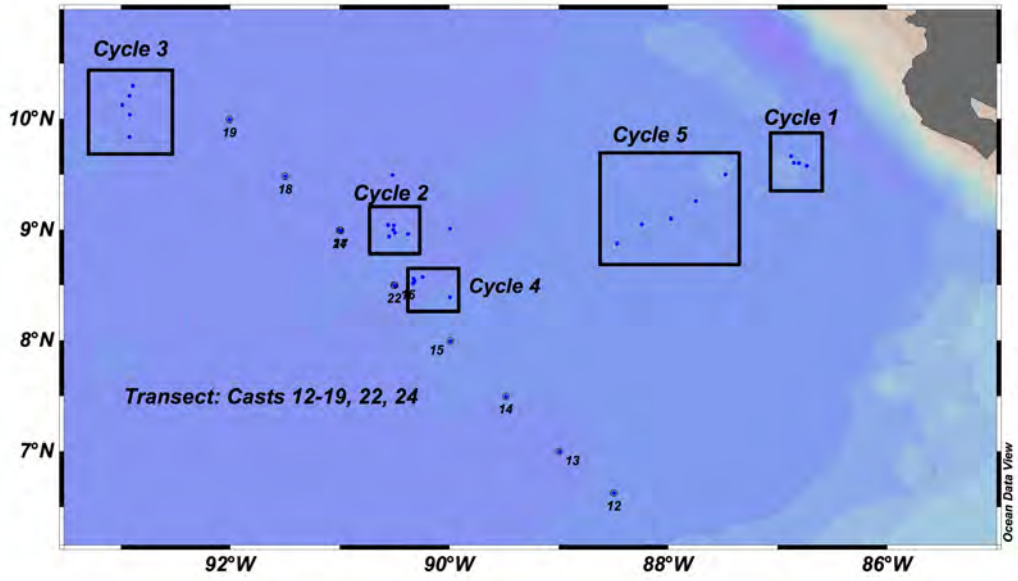
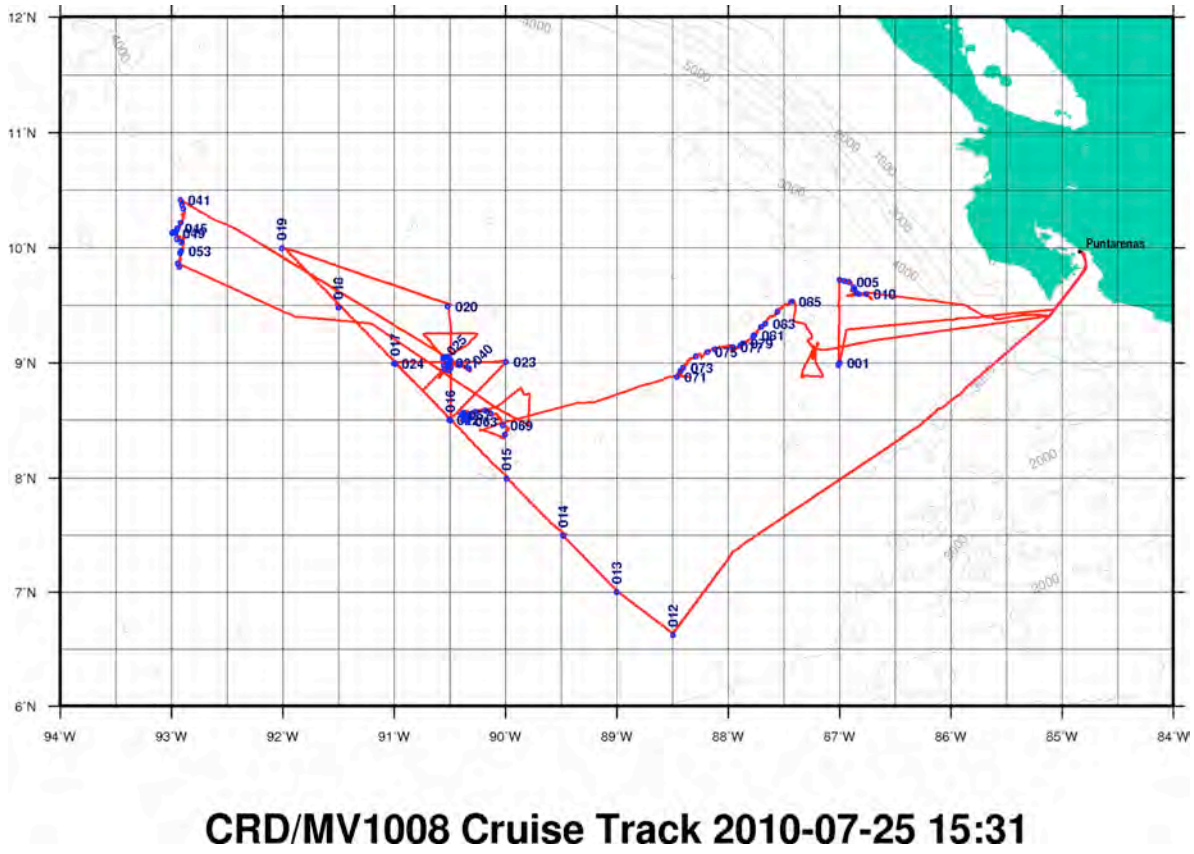


Fig. 1. Transect stations and experimental cycle locations.

trace elements and biogeochemistry of the upper oxygen minimum zone (OMZ). Grow-out experiments with various treatment combinations of added iron (Fe), zinc (Zn), and silicic acid (Si) were conducted during Cycles 2-5 with seawater collected from the mixed layer with the TM clean sampler and incubated for 4-6 days in seawater-cooled incubators on shipboard.



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CRUISE ACTIVITY SCHEDULE

23 June **CYCLE 1**

2200 Zooplankton net, biomass & gut sampling

24 June

0000 Deploy sediment trap array
0200 CTD, setup *in situ* experiments (400 m)
0430 Deploy *in situ* (drift) array
0500 Trace metal (TM) cast, setup deck experiments
0900 CTD, OMZ profile (800 m)
1030 Trace metal (TM) cast
1200 Zooplankton net, biomass & gut sampling
1230 Zooplankton live tow
1300 Trace metal (TM) cast
1630 Thorium pump
2000 Net tows, animals for experiments

25 June

0000 Zooplankton net, biomass & gut sampling
0200 CTD, setup *in situ* experiments (400 m)
0430 Recover/redeploy *in situ* array
0500 Trace metal (TM) cast
0800 Trace metal (TM) cast
1100 Zooplankton net, biomass & gut sampling
1230 MOCNESS, zooplankton sampling
1900 CTD, full dilution experiments & thorium
2100 Zooplankton net, biomass & gut sampling
2200 MOCNESS, zooplankton sampling

26 June

0200 CTD, setup *in situ* experiments (400 m)
0430 Recover/redeploy *in situ* array
0700 Trace metal (TM) cast
0800 Trace metal (TM) cast
1200 Zooplankton net, biomass, gut sampling, CSIA
1300 Phytoplankton net, CSIA
1600 Thorium pump
1900 CTD, water for evening experiments
2000 Zooplankton live tow
2130 Net tows, animals for experiments
2330 Zooplankton net, biomass & gut sampling

27 June

0030 Phytoplankyon net, CSIA
0130 CTD, final samples and thorium (400 m)
0330 Recover *in situ* (drift) array
0430 Recover sediment trap array
0530 Transit – Return to Puntarenas for personnel transfer

28 June Transit and **Begin TRANSECT SAMPLING**
3 July **End TRANSECT SAMPLING** (per Event Log)

03 July **CYCLE 2**

2230 Zooplankton net, biomass & gut sampling

04 July

0000 Deploy sediment trap array
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF Pre-dawn deployment
0600 CTD, OMZ profile (800 m) – molecular
0800 CTD, Thorium profile
0900 FRRF deployment
1000 Trace metal (TM) cast, nitrite max
1100 Zooplankton net, biomass & gut sampling
1130 FRRF deployment
1200 CTD cast (shallow) – PvE, Th
1300 Trace metal (TM) cast, nitrite max
1500 Trace metal (TM) cast – silicate addition exps
1800 FRRF deployment
1900 CTD (shallow), evening zooplankton exp, settling chamber
2000 Thorium pump
2100 Net tows, animals for experiments
2330 FRRF deployment

05 July

0000 Zooplankton net, biomass & gut sampling
0100 Phytoplankton net, CSIA
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF deployment
0600 Trace metal (TM) casts, Fe/Zn addition, depth 1
0800 CTD, OMZ profile (800 m)

1000 Trace metal (TM) casts, Fe/Zn addition, depth 2
1130 FRRF deployment
1230 Zooplankton net, biomass & gut sampling
1400 Trace metal (TM) cast, nitrite max
1600 Thorium pump
1800 FRRF deployment
1830 CTD (OMZ), nitrite max exp#1 (CB), Th, zoopl exps, Ally
2100 Net tows, animals for experiments
2230 Zooplankton net, biomass & gut sampling
2330 FRRF deployment

06 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0600 CTD, Th (Tak)
0800 Trace metal (TM) cast, deck incubations
0900 MOCNESS, zooplankton sampling (1000m)
1230 FRRF deployment
1300 Zooplankton net, biomass & gut sampling
1400 Phytoplankton net, CSIA
1500 Thorium pump
1600 CTD (OMZ), nitrite max exp #2 (CB)
1800 FRRF deployment
1900 CTD, full dilution experiments & thorium
2000 Phytoplankton net, 15N fractionation
2130 Zooplankton net, biomass & gut sampling
2200 MOCNESS, zooplankton sampling

07 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0700 CTD, deep cast (3000m)
1100 Zooplankton net, biomass & gut sampling
1130 FRRF deployment
1200 Trace metal (TM) cast
1330 FRRF deployment
1430 Pump, phytoplankton 15N size fractionation
1600 Thorium pump
1800 FRRF deployment

1900 CTD, water for evening experiments, settling chamber
2000 Net tows, animals for experiments
2100 Thorium pump
2330 Zooplankton net, biomass & gut sampling

08 July

0000 FRRF deployment
0130 CTD, final samples and thorium (500 m)
0330 Recover *in situ* (drift) array
0500 FRRF deployment
0530 Recover sediment trap array
0700 Transit to next experiment location

09 July **CYCLE 3**

0000 Deploy sediment trap array
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF Pre-dawn deployment
0530 CTD, OMZ profile (800 m) – molecular
0800 CTD, Thorium profile
0900 FRRF deployment
1000 Trace metal (TM) cast, nitrite max
1100 Zooplankton net tows, biomass & gut sampling, live
1130 FRRF deployment
1230 Trace metal (TM) cast, nitrite max
1500 FRRF deployment
1800 FRRF deployment
1900 CTD (shallow), evening zooplankton exp, settling chamber
2000 Thorium pump
2100 Net tows, animals for experiments
2330 FRRF deployment

10 July

0000 Zooplankton net tows, biomass & gut sampling, live
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF deployment
0600 Trace metal (TM) casts, Fe/Zn addition, depth 1
0700 CTD, OMZ profile (800 m)

0800 Trace metal (TM) casts, Fe/Zn addition, depth 2
1130 FRRF deployment
1230 Zooplankton net tows, biomass & gut sampling, live
1400 Trace metal (TM) cast, nitrite max
1530 FRRF deployment
1600 Thorium pump
1800 FRRF deployment
1830 CTD (OMZ), nitrite max exp#1 (CB), Th, zoopl exps, Ally
2100 Net tows, animals for experiments
2230 Zooplankton net tows, biomass & gut sampling, live
2330 FRRF deployment

11 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0600 CTD, Th (Tak)
0800 Trace metal (TM) cast, deck incubations
0900 MOCNESS, zooplankton sampling (1000m)
1230 FRRF deployment
1300 Zooplankton net tows, biomass & gut sampling, live
1400 Phytoplankton net, CSIA
1500 Phytoplankton net
1530 Thorium pump, shallow
1600 CTD (OMZ), nitrite max exp #2 (CB)
1800 FRRF deployment
1900 CTD, full dilution experiments & thorium
2000 Zooplankton live tow
2130 Zooplankton net tows, biomass & gut sampling, live
2200 MOCNESS, zooplankton sampling

12 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0600 CTD, deep cast (3000m)
0900 FRRF deployment
1000 Trace metal (TM) cast, incubation exps
1100 Zooplankton net tows, biomass & gut sampling, live
1130 FRRF deployment
1200 Trace metal (TM) cast

1400 FRRF deployment
1500 Pump, phytoplankton 15N size fractionation
1600 Thorium pump
1800 FRRF deployment
1900 CTD, water for evening experiments
2000 Net tows, animals for experiments
2330 Zooplankton net tows, biomass & gut sampling, live

13 July

0000 FRRF deployment
0130 CTD, final samples and thorium (500 m)
0330 Recover *in situ* (drift) array
0500 FRRF deployment
0530 Recover sediment trap array
0700 Transit to next experiment location

14 July **CYCLE 4**

2200 Zooplankton net tows

15 July

0000 Deploy sediment trap array
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF Pre-dawn deployment
0530 CTD, OMZ profile (800 m) – molecular
0800 CTD, Thorium profile
0900 FRRF deployment
1000 Trace metal (TM) cast, nitrite max
1100 Zooplankton net tows, biomass & gut sampling, live
1200 FRRF deployment
1300 Trace metal (TM) cast, nitrite max
1500 FRRF deployment
1530 Phytoplankton net, CSIA (2 h)
1800 FRRF deployment
1900 CTD (shallow), evening zooplankton exp, settling chamber
2000 Thorium pump
2100 Net tows, animals for experiments
2330 FRRF deployment

16 July

0000 Zooplankton net tows, biomass & gut sampling, live
0130 Zooplankton live net tow

0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0500 FRRF deployment
0600 Trace metal (TM) casts, Fe/Zn addition, depth 1
0630 CTD, OMZ profile (800 m)
0800 Trace metal (TM) casts, Fe/Zn addition, depth 2
0900 Zooplankton live net tows
1130 FRRF deployment
1230 Zooplankton net tows, biomass & gut sampling, live
1400 Trace metal (TM) cast, nitrite max
1500 FRRF deployment
1600 Thorium pump
1800 FRRF deployment
1830 CTD (OMZ), nitrite max exp#1 (CB), Th, zoopl exps, Ally
2000 Phytoplankton net tow
2100 Net tows, animals for experiments
2130 Zooplankton net tows, biomass & gut sampling, live
2330 FRRF deployment

17 July

0100 Zooplankton live net tow
0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0545 Trace metal (TM) cast, shallow
0615 CTD, Th (Tak)
0800 Trace metal (TM) cast, deck incubations
0900 MOCNESS, zooplankton sampling (1000m)
1230 FRRF deployment
1300 Zooplankton net tows, biomass & gut sampling, live
1400 Phytoplankton net tows, CSIA (2.5 h)
1630 Trace metal (TM) cast
1800 FRRF deployment
1900 CTD, full dilution experiments & thorium
1930 Zooplankton live tows
2100 FRRF deployment
2130 Zooplankton net tows, biomass & gut sampling
2200 MOCNESS, zooplankton sampling

18 July

0200 CTD, setup *in situ* experiments (500 m)

0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0600 CTD, deep cast (3000m)
0900 FRRF deployment
1000 Trace metal (TM) cast, incubation exps
1030 Zooplankton live net tow
1100 Zooplankton net tows, biomass & gut sampling, live
1130 FRRF deployment
1200 Trace metal (TM) cast
1400 FRRF deployment
1500 Zooplankton live net tow
1515 Thorium pump
1800 FRRF deployment
1900 CTD, water for evening experiments
2000 Net tows, animals for experiments
2100 Thorium pump
2330 Zooplankton net tows, biomass & gut sampling, live

19 July

0130 CTD, final samples and thorium (500 m)
0330 Recover *in situ* (drift) array
0530 Recover sediment trap array
0700 Transit to next experiment location

CYCLE 5

2230 Zooplankton net tows

20 July

0000 Deploy sediment trap array
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0530 CTD, OMZ profile (800 m) – molecular
0800 CTD, Thorium profile
1000 Trace metal (TM) cast, nitrite max
1030 Zooplankton live net tow
1100 Zooplankton net tows, biomass & gut sampling
1300 Trace metal (TM) cast, nitrite max
1500 FRRF deployment
1530 Phytoplankton net, CSIA (2 h)
1900 CTD (shallow), evening zooplankton exp, settling chamber
2000 Thorium pump
2100 Net tows, animals for experiments

21 July

0000 Zooplankton net tows, biomass & gut sampling, live
0200 CTD, setup *in situ* experiments (500 m)
0430 Deploy *in situ* (drift) array
0600 Trace metal (TM) casts, Fe/Zn addition experiments
0630 CTD, OMZ profile (800 m)
0800 Trace metal (TM) casts, Fe/Zn addition experiments
0830 Zooplankton live net tows
1230 Zooplankton net tows, biomass & gut sampling, live
1400 Trace metal (TM) cast, nitrite max
1530 Trace metal (TM) cast, shallow
1600 Bongo net tow
1800 FRRF deployment
1830 CTD (OMZ), nitrite max exp#1 (CB), Th, zoopl exps, Ally
2000 Zooplankton net tow
2100 Net tows, animals for experiments
2130 Zooplankton net tows, biomass & gut sampling, live
2330 Zooplankton live net tow

22 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0615 CTD, Th (Tak)
0900 MOCNESS, zooplankton sampling (1000m)
1230 Trace metal (TM) cast, surface profile
1300 Zooplankton net tows, biomass & gut sampling, live
1650 CTD (Decima, Stukel)
1900 CTD, full dilution experiments & thorium
1930 Zooplankton live tows
2130 Zooplankton net tows, biomass & gut sampling
2200 MOCNESS, zooplankton sampling

23 July

0200 CTD, setup *in situ* experiments (500 m)
0430 Recover/redeploy *in situ* array
0500 FRRF deployment
0600 CTD, deep cast (3000m)
1030 Zooplankton live net tow
1100 Zooplankton net tows, biomass & gut sampling, live
1200 Phytoplankton net tows, CSIA (2h)
1500 Zooplankton live net tow

1515 CTD, water for evening experiments, thorium
1900 Thorium pump
2000 Net tows, animals for experiments
2330 Zooplankton net tows, biomass & gut sampling, live

24 July

0130 CTD, final samples and thorium (500 m)
0330 Recover *in situ* (drift) array
0530 Recover sediment trap array

GROUP REPORTS

Plankton Sampling and Dynamics (M. Landry/SIO group; K. Selph/UHM):

Our group was responsible for coordinating the drifter experiments, including daily experimental estimates of phytoplankton growth and microzooplankton grazing rates by the dilution method at 8 sampling depths, initial and final measurements of abundances and biomass of bacteria and picophytoplankton by flow cytometry, initial and final assessments of phytoplankton by fluorometric Chl*a*, HPLC accessory pigments and biogenic silica, and initial and final assessments composition, biomass and size structure of auto- and heterotrophic protists by epifluorescence and inverted microscopy. As part of these daily process experiments incubated in net bags below the drift array, we also measured initial nutrient concentrations, primary production by the light-dark ^{14}C method, new production by $^{15}NO_3$ uptake, and net biogenic silica uptake by the 24-h difference in bSi. Size-fractioned samples for determination of mesozooplankton biomass and grazing by gut fluorescence were taken twice daily (midday, midnight) with oblique net hauls to 150 m with a 1-m ring net (200-µm mesh Nitex, General Oceanics flow meter, Vyper Suunto dive computer for depth and time) towed at ~1 kt. Lastly, we assessed carbon export using two different approaches, ^{238}U:^{234}Th disequilibrium and sediment traps. Transect and cycle data from these activities are presented in Figures 2-4 and Tables 1-3 below.

Microbial community analyses

Samples (250 ml) for fluorometric analyses of Chl a were filtered onto GF/F filters, and the Chl a extracted with 90% acetone in a dark freezer for 24 h. Extracted samples were shaken, warmed in the dark to room temperature, settled and quantified on a calibrated Turner Designs model 10 fluorometer. For HPLC analysis, 2-L samples of seawater were filtered onto Whatman GF/F filters and stored in liquid nitrogen.

FCM analyses were done with live samples on shipboard and with frozen preserved samples in the laboratory. On shipboard, we used a Beckman-Coulter XL with a 15-mW 488-nm argon ion laser and an Orion syringe pump to deliver 2.2-ml samples at a rate of 0.44 ml min^{-1}. For lab analyses, 2-mL samples were preserved (0.5% paraformaldehyde, final concentration), flash frozen in liquid nitrogen, and later thawed, stained with Hoechst 33342 and enumerated with a Beckman-Coulter Altra cytometer with 200-mW UV and 1-W 488-nm argon ion lasers. Fluorescence signals were normalized to 0.5 and 1.0-µm yellow-green (YG) polystyrene beads (Polysciences Inc., Warrington, PA). Listmode data files (FCS 2.0 format) of cell fluorescence and light-scatter properties were acquired with Expo32 software (Beckman-Coulter) and used with FlowJo software (Tree Star, Inc., www.flowjo.com).

For epifluorescence microscopy, seawater samples (500 mL) were preserved and cleared according to a modified protocol from Sherr and Sherr (1993), with sequential additions of 260 µL of alkaline Lugol's solution, 10 mL of buffered Formalin and 500 µL of sodium thiosulfate, followed by staining with 1 mL of proflavin (0.33% w/v) and 1 mL of DAPI (0.01 mg mL^{-1}). Aliquots of 50 mL were filtered onto 25-mm, 0.8-µm pore black polycarbonate filters to determine concentrations of nanoplankton, and the remaining 450-mL samples were filtered onto black 8.0-µm polycarbonate filters to determine concentrations of larger cells (microplankton). Filters were mounted onto glass slides and digitally imaged in Z-stack mode at 630X (nanoplankton) and 200X (microplankton) using an automated Zeiss Axiovert 200M inverted compound microscope (Taylor et al. 2012).

Rates of growth and protozoan grazing were estimated for the total phytoplankton community (Chl*a*) and for individual populations (flow cytometry, taxon-specific pigments) from the results of 2-treatment dilution experiments (Landry et al. 2009, 2012) incubated on the drift array. We prepared one diluted treatment and one control bottle (2.7-L polycarbonate) per depth, respectively, with 33% whole seawater (diluted with 0.1-µm Suporcap filtered seawater) and 100% seawater collected from Niskin bottles from the CTD-rosette. Initial FCM samples were taken from each bottle prior to deployment, and initial samples for Chl a and other variables were taken from the same Niskin bottle as the incubation water. Experiments were incubated for 24 hours (deployment/recovery ~0430 local time). Upon recovery, the incubation bottles were subsampled for FCM, pigments and microscopy. Instantaneous grazing rates (m) on Chl a or Syn cells are determined from net measured growth rates in treatment (k_t) and control bottles (k_c) as $m = (k_t - k_c)/(1 - 0.33)$. Instantaneous growth rates are determined as $\mu = k_c + m$.

Mesozooplankton analyses

The zooplankton net was washed down with seawater, and the codend contents placed in a bucket with carbonated water to prevent gut evacuation. The sample was split with a Folsom splitter, half preserved in a 4% buffered formalin solution, and typically 1/8 each used for biomass and gut fluorescence determinations. After wet sieving into 5 size classes of 0.2-0.5, 0.5-1, 1-2, 2-5 and >5 mm. Each size-fractioned sample for gut pigment analysis was concentrated onto a GFF filter and immediately frozen in the dark at -80°C for processing on shipboard or later in the lab. For biomass, each size-fraction was concentrated onto a pre-weighed 0.2-mm Nitex screen, rinsed with either ammonium formate to remove interstitial sea salt, placed in Petri dishes and frozen at -80°C for later analysis on shore.

Export measurements

Total 234Th concentrations were measured from 4-L samples. ^{234}Th:C ratios were assessed for each cycle from exported particulates collected in sediment traps and from larger suspended particulates collected in large volume samples with a McLane in situ pump. VERTEX-style sediment traps were deployed at 100-m depth and also at the base of the euphotic zone (50-60 m) for the duration of each cycle. Sediment trap tubes were sorted to remove zooplankton swimmers, split, and used for several different analyses including particulate C and N, ^{234}Th:C, particulate and dissolved Si, $CaCO_3$, pigments, and taxonomic enumeration.

Transect features

ADCP current measurements during the transect survey indicated that the target area for experimental Cycle 2 was, as intended, close to the central divergence region of the dome (Fig. 2). The region between 90° and 91°W (Stns. 15-17, 20-24) also had other obvious indications of upwelling – including cool surface temperature, shallow mixed layer, domed isoclines of temperature and nitrate in underlying waters, and enhanced concentrations (subsurface maxima) of Chl*a*, *Synechococcus* and *Prochlorococcus* (Figs. 3 and 4). However, the strongest expression of the subsurface maximum for pico-eukaryotes was in deeper waters on the northern end of the transect.

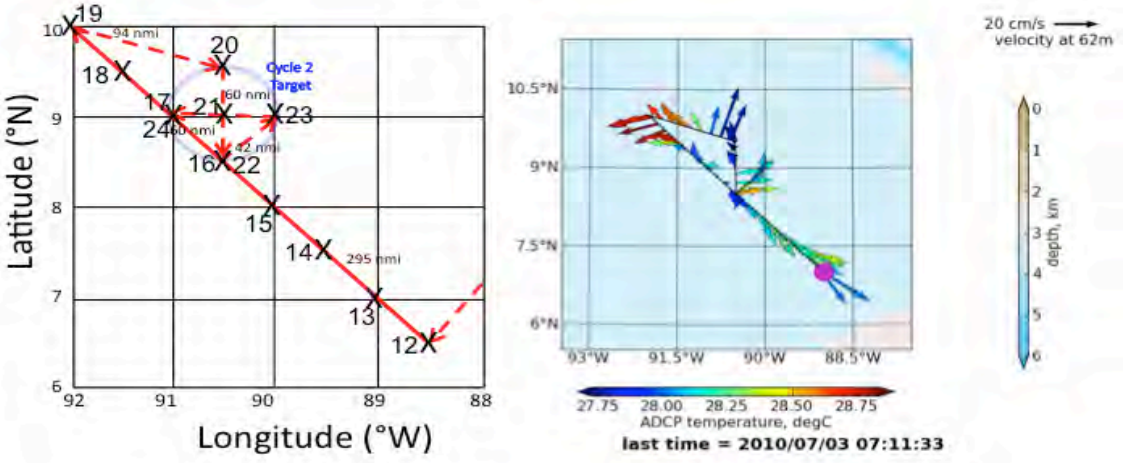

Fig. 2. Station sampling positions and ADCP current measurements at 62 m during the transect survey of the region.

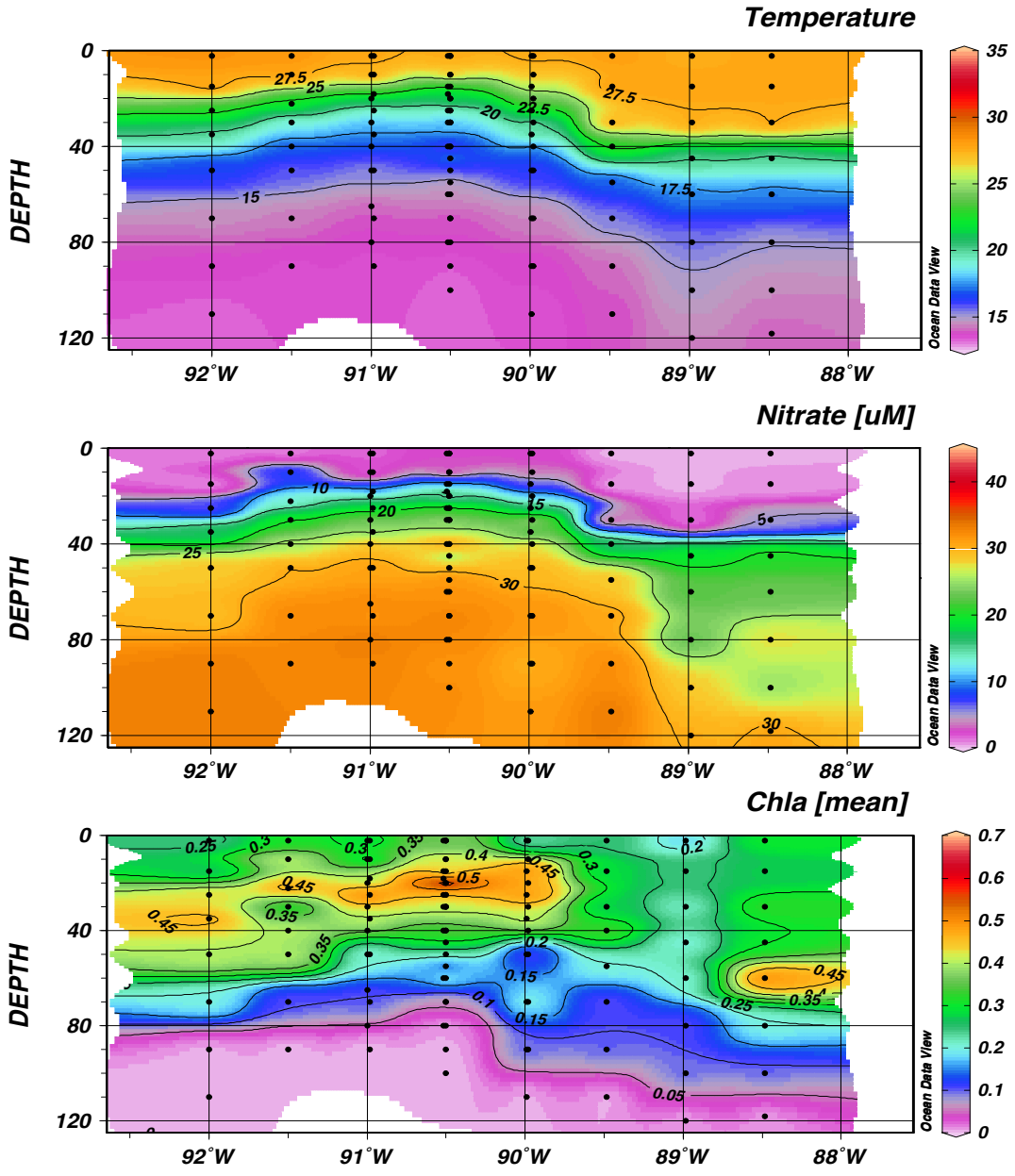

Fig. 3. Temperature (°C), nitrate (μM) and Chl*a* (μg m^{-3}) sections for the CRD FLUZiE transect survey.

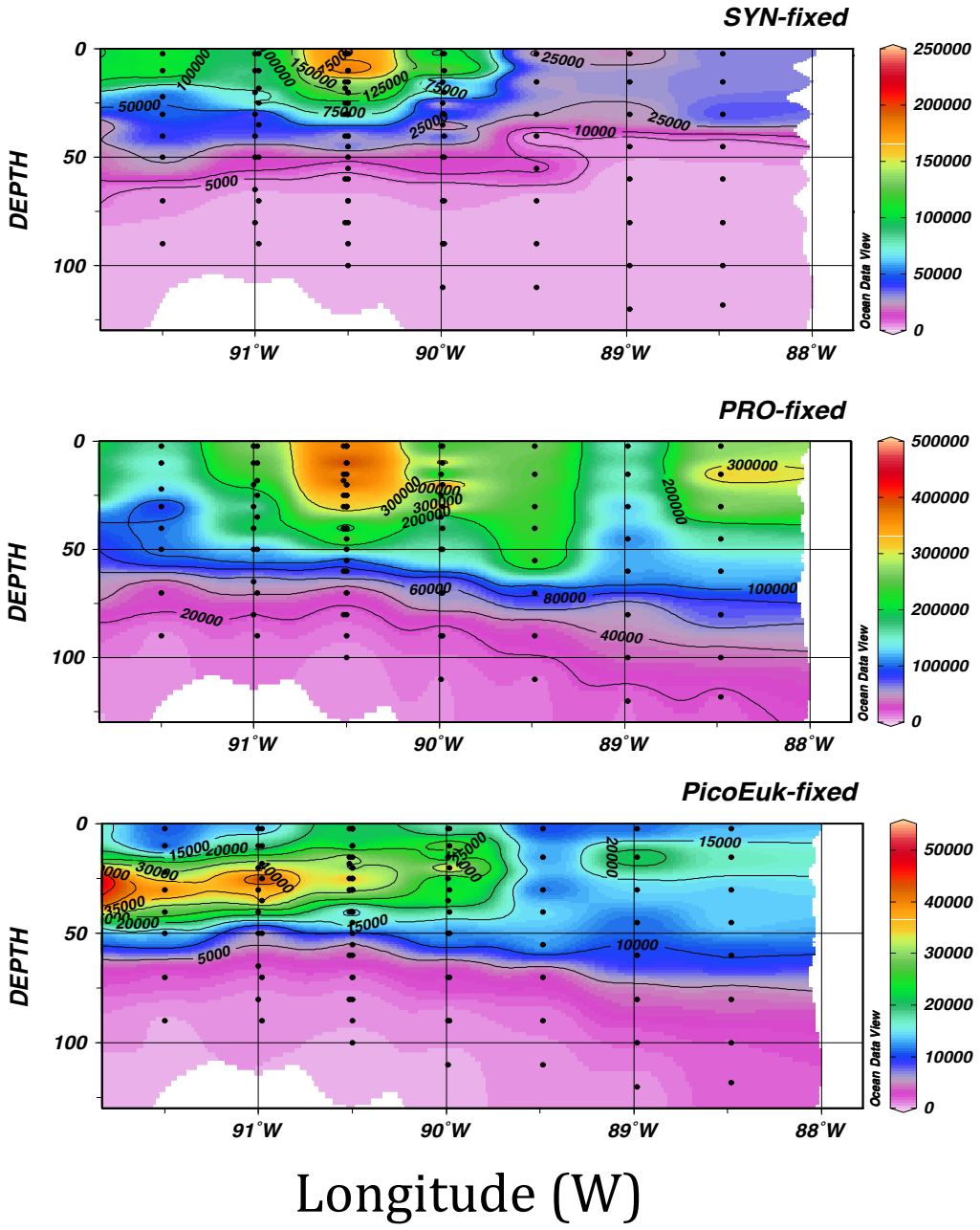

Fig. 4. Cell concentrations of photosynthetic picophytoplankton populations (cells ml^{-1}) along depth sections of the CRD FLUZiE transect. Estimates for *Synechococcus*, *Prochlorococcus* and pico-eukaryotes are based on laboratory flow cytometric analyses of fixed samples.

Trace Metals (J. Moffett, D. Chappell/USC and URI groups):

Trace metal sampling

We used a small trace metal clean powder-coated carousel, holding eight 5-L Teflon-coated exterior spring Niskin bottles lowered on a plastic-sheathed wire and programmed to collect samples at specified depths. After the rosette was brought on deck, the Niskins were detached and brought into a class-100 “clean” van kept under positive pressure with HEPA-filtered air for subsampling.

Trace metal limitation experiments

Two-liter Nalgene® polycarbonate sampling bottles were rinsed several times with sample water and filled with fresh seawater collected by the trace-metal rosette. Nutrient treatments were as follows: Control (no additions); + 2 nM Zn (added as zinc chloride); + 5 nM Fe (added as ferric chloride); + 2 µM Si (sodium silicate); + 2 nM Zn + 2 µM Si; + 5 nM Fe + 2 µM Si (incubation 2 only). Samples were placed inside blue Plexiglas incubation tanks, fastened to the deck. Ocean water was circulated throughout each incubation tank to simulate ocean temperature. Incubation cycles lasted for a period of about 72 hours (3 days).

At the end of the incubation, the sample water was filtered using a masterflex® peristaltic pump onto two filters attached in series (3 µm, 0.2 µm). Once filters became obstructed with sampling matter or 500 mL of water had passed through, the filters were placed in either RNA or DNA lysis buffer, flash frozen in liquid nitrogen and stored at -80 °C. Unfiltered samples were collected for flow cytometry, which was analyzed on shipboard. Additionally, 50 mL from each sample bottle was filtered onto a glass fiber filter (GFF) using a vacuum pump for chlorophyll analysis.

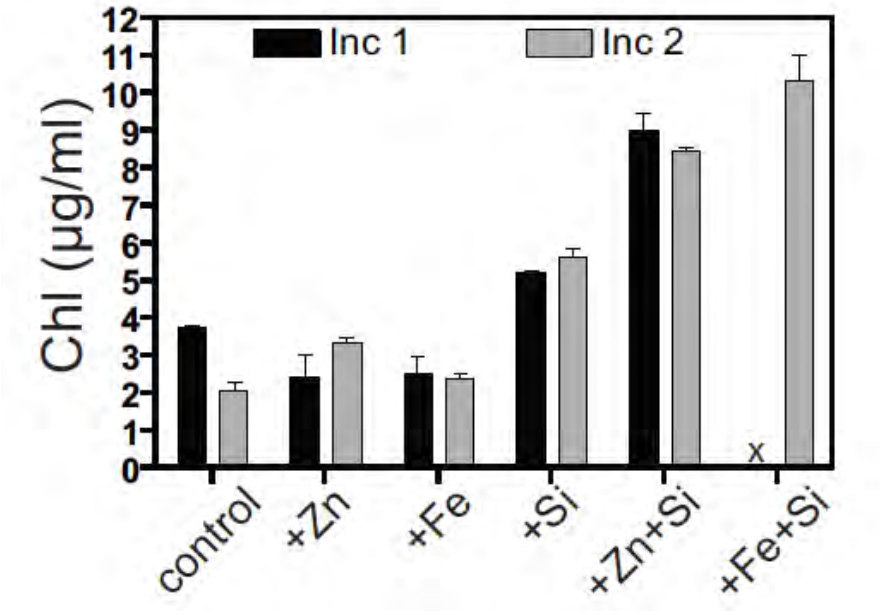

Fig. 5. Chlorophyll results for incubation 1 (Cycle 3) and incubation 2 (Cycle 4).

In incubation 1, there was a slight decrease in chlorophyll abundance when either trace metal was added, a slight increase with silicate addition and a dramatic increase when Zn and silicate were added (Fig. 5). In incubation 2, there was no significant response when either trace metal was added, a moderate response to silicate additions, and a dramatic increase in chlorophyll abundance following the addition of silicate and either Fe or Zn. Our results show that while Zn and Fe alone did not contribute a staggering increase in productivity, combining either nutrient with silicate addition led to a large biological response. This may be indicative of an increased response for nutrient utilization by diatoms, which use silica to make their frustules and suggests trace metal-silica co-limitation.

Photosynthetic Physiology and Si Experiments (J. Goes/Bigelow group):

Photo-physiological competency and biomass accumulation

We measured the photosynthetic competency of phytoplankton cells with a profiling Fast Repetition Rate Fluorometer (FRRF), KIMOTO®, Japan. In addition to maximum fluorescence readings, which define the distribution of phytoplankton chlorophyll in the water column, the FRRF instrument provides an estimate of the functional absorption cross-section of PSII due to changes in the chlorophyll content of the light-harvesting complex. Variable fluorescence (F_v/F_{max}) is an estimate of the maximum photosynthetic quantum yield, which reflects the overall health of the phytoplankton community with respect to environmental conditions. Since F_v/F_{max} and sPSII measurements are independent of chlorophyll, they can also be interpreted in terms of relative growth rates, allowing for discrimination between environmental regulation of photosynthetic competency and grazing pressure as factors controlling biomass accumulation.

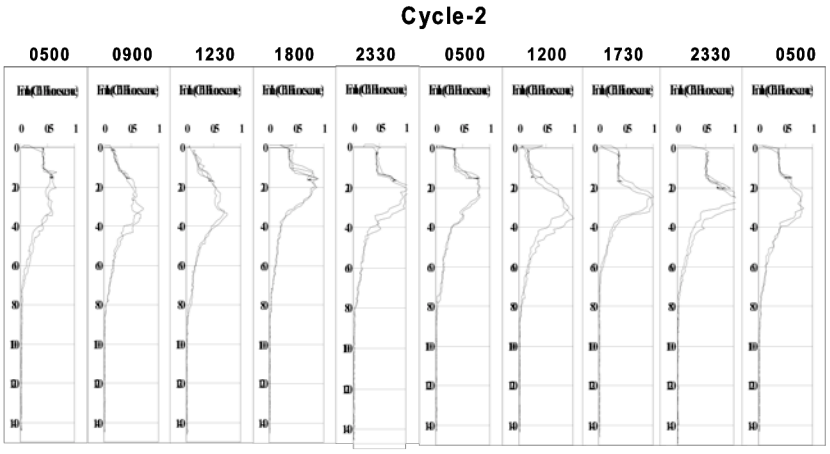

Fig. 6. FRRF chlorophyll profiles for 2 days during Cycle 2 showing the evolution of chlorophyll within the water column.

FRRF profiles obtained roughly at 5 to 6 h intervals during cycle experiments yielded interesting information about photosynthetic capacity, and the daily cycle of phytoplankton biomass accumulation and decline. At all stations, Chl *a* profiles showed the presence broad subsurface chlorophyll maxima that extended between 15

and 40 m and were invariably comprised of two peaks (Fig. 6). Flow cytometric measurements made on samples from the two peaks revealed two distinct populations of *Synechococcus* that could be discriminated on the basis of size. A significant increase in the magnitude of the chlorophyll peak was observed each day in the FRRF chlorophyll profiles between dawn and midnight, suggesting active growth and biomass accumulation. The decline of chlorophyll between midnight and dawn indicates that grazing may be exerting a significant control on phytoplankton biomass accumulation.

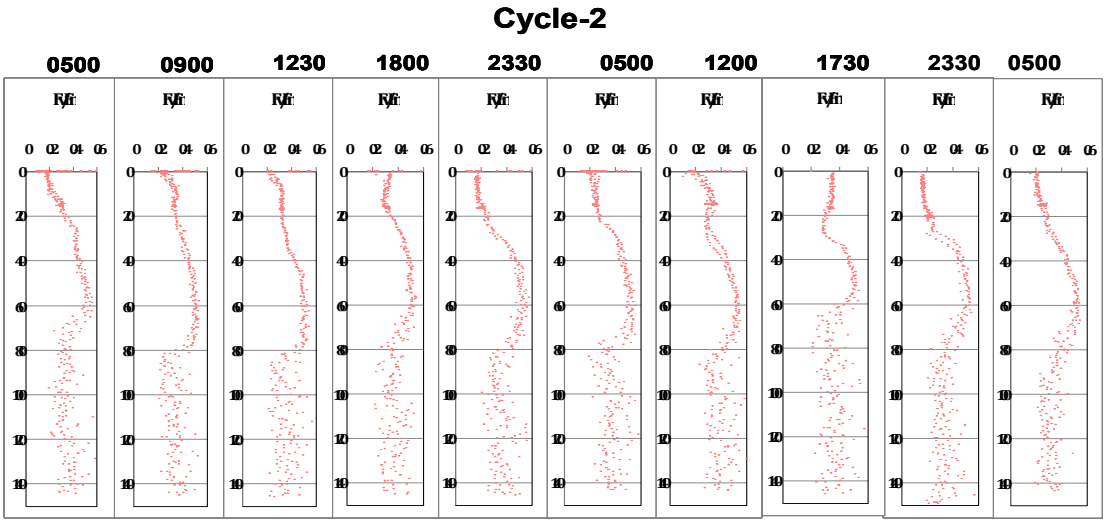

Fig. 7. Fv/Fm profiles over 2 days during Cycle 2.

The very low Fv/Fm values in the upper 25 are indicative of stress (Fig. 7). Maximum values below the mixed layer (40-60 m) are consistent with the view that that the euphotic zone is strongly partitioned into physiologically different habitats for phytoplankton. Growth of phytoplankton between dawn and midnight in the upper 25 m suggests that grazing could be liberating limiting nutrients (Fe, Zn and Si) on a diel pattern. Because Fv/Fm increases in the upper 25m between noon and 6 pm each day, photochemical processes are also likely making essential elements available for phytoplankton growth. FRRF data will be evaluated with these .

Trace Metal and Si Experiments

Samples were carefully dispensed into acid-washed, trace-metal free polycarbonate incubation bottles, and then spiked with 2nM each of Fe, Zn and silicate, in a trace-metal clean van to minimize contamination. Trace metal experiments for Cycles 2-4 were all conducted at ambient light conditions. During Cycle 5, however, the enrichment experiments with these 3 elements involved incubations at lower (10% of the ambient) light intensity as well.

Trace metal and Si enrichments for the first set of experiments were undertaken by spiking sets of 5 bottles separately with 2 nM/L trace metal solutions and about 8 nM/L of Si. In addition a set of 5 bottles to which nothing was added served as controls. These bottles were transferred to a seawater-cooled deck incubator. Sub-samples of the original seawater samples were filtered to obtain T_0

values of Chl*a*, HPLC pigments, flow-cytometry and photosynthetic competency and physiological rate measurements in the SaFIRe. Thereafter, sub-samples from the experimental and control samples were drawn every 2nd day. Before the measurements were made in the SaFIRe, seawater samples were kept under dark and ambient temperature conditions, allowing the cells to open all of their Photosystem II reaction centers and reduce photochemical quenching.

During these incubations, the photosynthetic competency and the physiological status of the cells were examined using measurements of variable fluorescence (Fv/Fm), the maximum quantum yield and the size of the photosystem II in a Satlantic FIRe Fluorometer System, which flashes a short intense burst of light and records the fluorescence induction and relaxation yields from intracellular chlorophyll associated with the natural populations of phytoplankton. The analysis of fluorescence induction on microsecond time scales (Phase 1) provides the minimum (Fo) and maximum (Fm) fluorescence yields, the quantum efficiency of photochemistry in PSII (Fv/Fm), the functional absorption cross-section of PSII (σPSII), and the energy transfer between PSII units ('connectivity factor', p). To accommodate efficient excitation of diverse functional groups within phytoplankton communities including a variety of cyanobacteria, the SaFIRe utilizes high luminosity blue (450 nm with 30 nm bandwidth) and green (530 nm with 30 nm bandwidth) light-emitting diodes (LEDs) to excite chlorophyll and bacteriochlorophyll (BChl) fluorescence *in vivo*. The fluorescence signal is isolated by red (678 nm, with 20 nm bandwidth, for Chl-a fluorescence) or infra-red (880 nm with 50 nm bandwidth, for BChl-a fluorescence) interference filters and detected by a sensitive avalanche photodiode module can be used to discriminate larger eukaryotic chlorophyll from cyanobacterial chlorophyll, respectively.

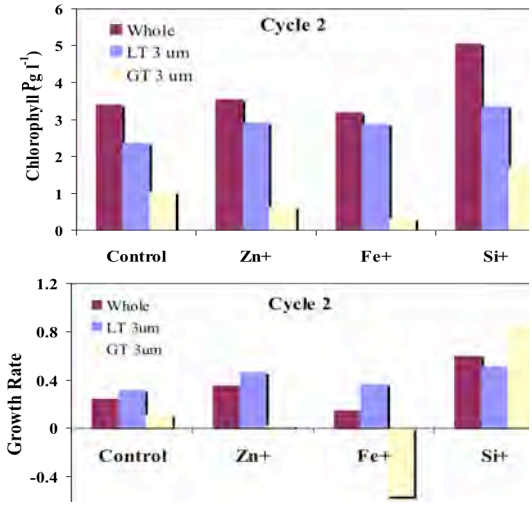

Fig. 8. Effects of Zn, Fe and Si enrichment on chlorophyll and growth rates for the whole phytoplankton community, for less than (LT) 3 μm and for greater than (GT) 3 μm size fractions phytoplankton (Cycle 2).

Data from the Cycle 2 enrichment experiment are representative of the general response of the CRD phytoplankton community to Fe, Zn and Si in showing the strongest response to Si enrichment (Fig. 8). The response to Si was greater for >3-μm cells (largely diatoms) than <3-μm populat ions (largely *Synechococcus*). With the trace metal treatments, growth and cell division rates for the <3-μm fraction were greater in cells treated with Zn than with Fe.

For Si-light experiments, seawater was collected with the TM-clean rosette and transferred into 40 x 1-L acid-washed Whirlpak bags. Of these, 20 were kept as unenriched controls and 20 were spiked with 8 nM Si. Sets of 10 control and Si enriched bags were then transferred into two different deck incubators, one

exposed to ambient light and the other to roughly 10% of the ambient light. Noon-time ambient light levels ranged from 1000-1400 mE m^{-2} s^{-1}. These manipulations resulted in 4 treatments, Si enriched/high light, Si enriched/low light, Control/high light, and Control/low light. After initial sub-sampling for Chl*a*, HPLC pigments, flow-cytometry and SaFIRe photosynthetic competency/physiological rate measurements, the bags were transferred to the on-deck incubators. Every second day, two bags from each treatment/controls were sacrificed for measurements, described above.

Preliminary results show that Si enrichment led to significant increases in chlorophyll over the first three days of the incubation (Fig. 9). Thereafter, Chl*a* increase was highest for Si enriched/high light conditions than under reduced light. Chl*a* peaked by day 5, declining thereafter. Under high light, the greatest Chl*a* increase was for the >3-µm fraction, suggesting that CRD diatoms were both Si and light limited. A smaller response was observed for the <3-µm fraction under HL conditions.

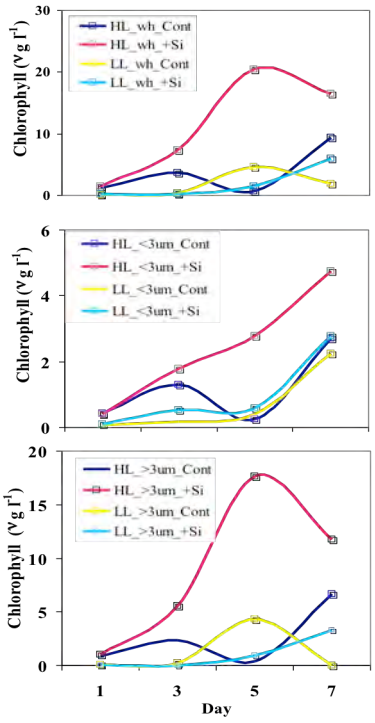

Fig. 9. Phytoplankton responses to Si enrichment and light level during Cycle 2. Chlorophyll values are for the whole community (TOP), the <3-µm size fraction (MIDDLE), and the >3-µm size fraction (BOTTOM).

Stratified Zooplankton Sampling (S. Smith group):

Vertically stratified plankton sampling was conducted with a 1-m^2 MOCNESS (Multiple Opening-Closing Net and Environmental Sampling System) fitted with nine 202-µm mesh nets and sensors for temperature, salinity, O_2, beam attenuation coefficient, and Chl*a* fluorescence. One mid-day (typically beginning 09:00-10:00) and one mid-night (typically 22:00) tow were taken to 1000 m during each of the experimental cycles (25 June, 6 July, 11 July, 17 July and 22 July for Cycles 1-5, respectively). Net 1 sampled during descent through the full tow depth. Other sampling depths were approximately 0-25, 25-75, 75-100, 100-200, 200-300, 300-450, 450-600, 600-750 and 750-1000m. The volume of water filtered was determined by a flow meter on the MOCNESS frame. A CTD cast was taken at each of the stations for each of the allotted time periods just prior to the MOCNESS deployment, in order to compare mesozooplankton abundance with variables such as oxygen concentration, temperature and Chl*a* concentration. Immediately after each MOCNESS tow, the cod end contents were split with a Folsom splitter, with 30% of the sample going to the Scripps Institution of Oceanography (University of California San Diego) for placement in its Pelagic Collections archive. Fifty percent of the split sample was used by the Rosenstiel School of Marine and Atmospheric Sciences (University of Miami) for analysis of Eucalanidae copepods in the upper 200 m of the water column, and the remaining 20% was used for dry weight analyses. All fish and

fish larvae were removed for stable isotope analysis to be done by the University of Hawaii (B. Popp, C,J. Bradley). Preserved subsamples were fixed with 5% neutral formalin.

For fractions analyzed for dry weights, the 20% fraction was filtered onto pre-weighed 9-cm Whatman #1 filter paper and placed in a drying oven for 48 h at 50°C. Large salps and medusae were removed from these samples before filtration. Dry weights were determined with a Cahn microbalance in the laboratory at the University of Miami.

Depth-resolved abundance data for the Eucalanidae (adult females, adult males, and lumped copepodids) for the species *Subeucalanus subtenuis*, *Eucalanus inermis, Subeucalanus subcrassus*, Paraeucalanus *subtenuis* and *Rhincalanus* spp., as well as lipid sac volumes and egg production rates for *Eucalanus inermis*, are published in a senior thesis at University of Miami (Jackson, 2012).

Plankton Stoichiometry and Condition (S. Baines & X. Chen/SUNY):

Zooplankton samples

We collected samples for analysis of zooplankton elemental composition (C, N, P, Fe and Zn) to gauge whether zooplankton exhibit variation in elemental composition across gradients in availability of Zn and Fe. These data will be among the first of their kind from a low trace element area, and certainly the first from a region suspected to be limited by Zn. We also collected samples to assess RNA:DNA ratios in zooplankton to determine if changes in elemental composition of food along the same gradients affected the physiological condition of zooplankton, or if variation in elemental content mirrors condition. For both elemental composition and RNS:DNA ratio samples.

For both sets of measurements, samples were taken from split of oblique tows of the upper 100 m that were also used to estimate biomass, composition and gut fluorescence. These samples were taken at each station along the transect through the region that was intended to identify the location of the Costa Rica Dome. Samples were also collected at the beginning and end of all five cycle experiments. In addition, three experiments assessing the effect of Zn and Fe addition on condition, elemental content and egg production of a single species of copepod were sampled.

Samples for analysis of Fe were well rinsed with oxalate and chelexed seawater to remove external contamination before being frozen on-board. Samples for RNA:DNA analysis were simply frozen. Both sets of samples were stored at 70C on ship, transferred to Scripps then shipped to Stony Brook and stored at -70C. Samples for elemental composition were freeze-dried and macerated. Subsamples were later removed and weighed for analysis of C and N on a CNS analyzer (Elmantech), and total phosphorus colorimetrically using reaction with acid molybdate after hydrolysis of ashed samples. Samples for trace element analysis were freeze dried and extracted for analysis by ICP-MS at the Bigelow Institute for Ocean Sciences by Benjamin Twining.

Single celled analysis of algal elemental composition

Samples were prepared for single cell analysis of algal elemental content using synchrotron-based x-ray fluorescence microscopy (SXRF). Our intent is to determine if elemental compositions of key functional groups (picocyanobacteria, diatoms and heterotrophic and aurotrophic nanoflagellates) indicate Zn, Fe or Si limitation, and whether limitation indices change with gradients in availability of these three elements and with depth in the euphotic zone. We also want to assess the potential for low Zn and Fe content in algae to pose a problem for heterotrophs in terms of food quality.

Water samples collected using a trace metal clean rosette were preserved with TM-clean glutaraldehyde under a laminar flow hood with a class 100 HEPA filter. Cells were then sedimented onto Au-transmission electron microscopy grids that were covered with a carbon-formvar membrane. Grids were then imaged under differential interference contrast. Corresponding epifluorescence images were also taken using Chlorophyll, FITC and Phycoerythrin filter sets so as to differentiate autotrophic and heterotrophic cells, as well as cells containing phycoerythrin. At least one entire grid was imaged for every sample taken.

Samples were taken from the surface and the sub-surface chlorophyll maximum at every station of the regional transect except one. At least one sample was taken from the surface and sub-surface chlorophyll maximum during each of the process experiments as well. Often more than one sample was taken during the experiments, and at some stations more that two depths were sampled. In addition, we sampled deckboard Zn, Fe and Si enrichment experiments that were initiated by Jim Moffett's and Joachim Goes groups.

Natural Abundance Isotope Ratios (C. Buchwald/K. Casciotti lab WHOI):

During the cruise, we collected ten 24-depth profiles for natural abundance isotope ratios ($\delta^{18}O$ and $\delta^{15}N$) of nitrite (NO_2^-) and nitrate (NO_3^-). Using the $\delta^{18}O$ and $\delta^{15}N$ profiles, we will be able to predict the relative rates of different nitrogen transformation processes. In addition to isotope profiles, we measured rates of nitrification, the oxidation of ammonia to nitrite at three depths in the water column: the surface, the primary nitrite maximum and just above oxygen minimum zone. These rates will be used to compare to the predicted rates from isotope modeling. Lastly, experiments were set up to measure the oxygen isotope systematics of nitrification aimed at determining the oxygen isotope signature of nitrification. The ^{18}O signature of nitrification is important when creating a global ocean nitrate budget using the oxygen isotope of deep-water nitrate.

Molecular Sampling in the OMZ (T. Kataoka/H. Liu lab HKUST):

We applied molecular techniques (i.e. clone library, qPCR and qRT-PCR) to investigate the diversity and distribution of the anaerobic ammonia oxidation (anammox) bacteria in the oxygen minimum zone (OMZ). Primers targeting anammox cluster 1 (hzocl-1) and cluster 2a (hzocl-2a) were used to amplify hydrazine oxidoreductase genes (hzo) from samples in the OMZ boundary and core zones. Hzo genes were obtained from upper and middle OMZ (350, 500 m) at Stn 1 and

phylogenetic analysis showed hzo sequences from cluster I were quite conserved, with sequences similarity of 99% between each other. Blast search showed the hzo sequences recovered from fCRD07 (Stn 1, 350 m) are more than 97% similar to sequences previously collected from the sediment in Jiaozhou Bay (China) and the South China Sea. QPCR analysis showed Anammox bacteria dominated in the upper OMZ (350 ~ 400 m), and their amount decreased in the deep ocean. In order to evaluate the source of NH4+, nifH genes were also studied and sequences obtained from cDNA clone libraries from three samples (150, 350 and 700 m) showed a change from the dominance of α-proteobacteria in the shallow layer to the dominance of γ-proteobacteria in the deeper samples.

Table 1. Hydrographic data from CTD profiles through the base of the euphotic zone and upper OMZ transition. Cell counts of heterotrophic bacteria (Hbact), *Prochlorococcus* (Prochloro), *Synechococcus* (Synecho), and pico-eukaryote phytoplankton (Pico-euk) are from flow cytometry. Estimates of ^{14}C primary productivity (Cycles 2-5 only) are the difference between light and dark bottle uptake rates for 24-h incubations under *in situ* conditions of light and temperature at depth of water collection.

Day	CTD	Cycle Stn	Depth (m)	Temp °C	Salinity PSU	Density Sigma-t	O_2 ml/l	NO_3 µM	NO_2 µM	PO_4 µM	SiO_4 µM	Chl a µg/l	Hbact cells/ml	Prochlo cells/ml	Synecho cells/ml	Pico-euk cells/ml	^{14}C-PP mgC/m^3
6/24	3	Cy1	2	28.59	33.63	21.18	4.580	0.15	0.02	0.15	0.80	0.205	1,567,834	128,397	167,077	6,414	
6/24	3	Cy1	12	28.60	33.63	21.22	4.578	0.12	0.02	0.14	0.84	0.201	2,034,821	126,567	160,684	6,834	
6/24	3	Cy1	20	28.11	33.93	21.64	4.072	0.08	0.02	0.21	1.22	0.350	1,753,224	128,698	170,101	14,454	
6/24	3	Cy1	30	25.10	34.42	23.00	2.364	0.33	0.07	0.64	4.19	0.395	1,073,034	130,958	129,150	32,180	
6/24	3	Cy1	40	20.04	34.68	24.69	1.640	21.2	0.97	1.61	12.5	0.327	448,022	103,094	18,027	20,707	
6/24	3	Cy1	55	15.85	34.83	25.89	0.592	28.7	0.06	2.02	18.3	0.140	395,456	20,072	4,682	3,821	
6/24	3	Cy1	70	15.24	34.86	26.12	0.430	30.2	0.04	2.09	19.4	0.107	245,884	17,715	1,270	3,541	
6/24	3	Cy1	90	14.24	34.90	26.46	0.298	31.6	0.04	2.16	21.2	0.298	280,035	27,455	334	26,691	
6/25	6	Cy1	2	28.51	33.57	21.16	4.556	0.00	0.03	0.14	0.84	0.120	320,447	46,354	101,200	5,887	
6/25	6	Cy1	12	28.51	33.57	21.20	4.538	0.04	0.02	0.21	0.72	0.214	315,879	50,939	99,176	5,338	
6/25	6	Cy1	20	27.84	34.03	21.80	3.864	0.26	0.04	0.36	1.92	0.397	303,358	49,497	76,080	10,956	
6/25	6	Cy1	30	21.77	34.68	24.17	2.519	14.2	0.97	1.14	8.00	0.430	240,949	63,402	20,277	19,286	
6/25	6	Cy1	40	19.99	34.70	24.71	1.838	19.2	0.66	1.47	11.4	0.316	226,695	54,921	9,869	14,131	
6/25	6	Cy1	55	16.70	34.78	25.66	0.797	27.7	0.07	1.97	17.7	0.190	172,029	23,150	13,184	5,683	
6/25	6	Cy1	70	14.97	34.87	26.19	0.367	31.2	0.04	2.14	20.0	0.113	120,488	6,231	990	2,465	
6/25	6	Cy1	90	14.17	34.89	26.47	0.105	33.2	0.02	2.26	21.8	0.054	97,230	1,765	409	2,239	
6/26	9	Cy1	2	28.57	33.56	21.13	4.492	0.05	0.03	0.14	0.85	0.206	1,066,446	19,523	50,896	4,628	
6/26	9	Cy1	12	28.58	33.55	21.17	4.478	0.10	0.03	0.21	0.77	0.186	1,051,404	19,426	53,877	5,069	
6/26	9	Cy1	20	27.93	33.99	21.74	3.859	0.08	0.04	0.29	1.61	0.580	1,011,518	19,545	54,738	7,501	
6/26	9	Cy1	30	23.92	34.50	23.42	2.042	1.12	0.29	0.85	4.86	0.385	747,154	42,157	37,787	21,213	
6/26	9	Cy1	40	18.60	34.70	25.07	1.525	22.2	0.47	1.72	14.6	0.441	813,619	32,126	10,041	9,568	
6/26	9	Cy1	55	15.90	34.83	25.88	0.526	29.0	0.06	2.06	18.5	0.210	568,234	12,355	4,639	2,669	
6/26	9	Cy1	70	14.94	34.87	26.20	0.230	31.4	0.04	2.17	20.4	0.096	440,790	3,702	2,260	1,001	

6/27	11	Cy1	12	28.38	33.56	21.24	4.447	0.07	0.03	0.19	0.94	0.232	818,800	153,839	100,619	9,632
6/27	11	Cy1	20	28.25	33.65	21.38	4.392	0.04	0.05	0.20	0.92	0.377	744,765	104,159	78,491	9,643
6/27	11	Cy1	30	25.04	34.49	23.07	3.383	0.51	0.07	0.49	1.84	0.494	1,030,746	30,813	95,958	13,302
6/27	11	Cy1	40	18.69	34.69	25.04	1.386	21.7	0.42	1.73	13.3	0.303	697,604	54,060	27,132	7,900
6/27	11	Cy1	55	17.00	34.80	25.61	0.695	27.6	0.07	2.02	17.4	0.192	655,673	29,048	10,773	2,518
6/27	11	Cy1	70	15.44	34.83	26.05	0.382	30.1	0.06	2.15	19.3	0.111	453,446	25,034	5,274	1,421
6/27	11	Cy1	90	14.22	34.84	26.42	0.282	31.2	0.01	2.30	21.8	0.060	250,099	12,011	2,658	495
6/29	12	St 1	2	27.70	33.45	21.34	4.430	0.38	0.09	0.26	1.36	0.275	945,905	272,345	30,985	10,644
6/29	12	St 1	15	27.70	33.50	21.43	4.407	0.60	0.09	0.26	1.51	0.297	864,616	315,729	31,620	13,841
6/29	12	St 1	30	27.78	33.55	21.51	4.337	5.10	0.15	0.51	3.44	0.318	1,171,477	269,999	35,904	11,387
6/29	12	St 1	45	19.71	34.66	24.78	1.714	20.5	0.39	1.52	11.2	0.262	825,677	158,855	3,412	11,591
6/29	12	St 1	60	17.15	34.76	25.56	1.702	22.9	0.37	1.65	16.0	0.479	572,414	122,843	1,281	8,319
6/29	12	St 1	80	14.97	34.91	26.27	1.083	27.4	0.10	1.87	18.3	0.197	298,928	71,635	323	3,293
6/29	12	St 1	100	14.37	34.94	26.51	0.668	24.3	0.20	1.67	16.6	0.078	457,245	36,668	183	1,550
6/29	12	St 1	118	13.93	34.94	26.68	0.876	30.98	0.03	2.00	19.2	0.038	1,706,696	14,034	108	1,464
6/30	13	St 2	2	27.53	33.16	21.18	4.434	0.30	0.06	0.31	1.16	0.179	763,868	147,888	22,321	8,987
6/30	13	St 2	15	27.74	33.32	21.28	4.376	0.26	0.05	0.26	1.41	0.237	825,139	142,700	28,704	17,963
6/30	13	St 2	30	27.77	33.46	21.44	4.296	0.73	0.09	0.29	2.17	0.214	693,805	119,754	23,333	11,570
6/30	13	St 2	45	19.88	34.66	24.73	1.767	19.1	0.35	1.48	11.0	0.202	747,832	104,644	2,260	9,094
6/30	13	St 2	60	17.28	34.87	25.61	1.825	22.1	0.72	1.62	14.1	0.179	435,957	115,374	484	7,932
6/30	13	St 2	80	15.46	34.92	26.17	1.201	22.5	0.25	1.60	15.2	0.120	285,658	47,011	172	3,100
6/30	13	St 2	100	14.93	34.94	26.39	0.867	28.4	0.06	1.93	18.2	0.085	252,467	35,592	151	1,281
6/30	13	St 2	120	14.25	34.94	26.63	0.655	30.0	0.04	2.11	20.2	0.029	228,143	10,149	75	441
6/30	14	St 3	2	27.95	33.27	21.12	4.390	0.17	0.04	0.23	1.22	0.246	607,683	258,838	22,515	8,104
6/30	14	St 3	15	27.93	33.33	21.23	4.339	0.23	0.07	0.24	1.74	0.276	527,965	249,841	25,658	9,934
6/30	14	St 3	30	27.92	33.37	21.31	4.254	2.07	0.04	0.31	2.45	0.269	662,357	241,564	25,819	8,782
6/30	14	St 3	40	22.74	34.20	23.58	1.258	16.4	0.49	1.29	7.03	0.329	489,543	237,808	2,013	11,946
6/30	14	St 3	55	16.76	34.84	25.69	0.593	28.8	0.16	2.05	16.4	0.239	609,825	245,568	10,763	10,763
6/30	14	St 3	70	15.32	34.84	26.09	0.395	30.5	0.11	2.17	19.2	0.128	189,721	75,962	1,367	1,808
6/30	14	St 3	80	14.06	34.86	26.47	0.259	32.2	0.03	2.25	22.1	0.072	161,298	24,485	431	850
6/30	14	St 3	100	13.74	34.92	26.67	0.212	33.2	0.02	2.27	22.6	0.037	138,051	11,258	215	570
6/30	15	St 4	2	27.76	33.74	21.54	4.373	1.71	0.09	0.35	2.35	0.223	628,358	81,687	45,213	6,608

6/30	15	St 4	15	25.83	34.00	22.40	3.552	5.65	0.35	0.62	3.29	0.478	745,572	83,506	33,913	10,709
6/30	15	St 4	25	22.85	34.35	23.59	2.145	15.7	0.50	1.25	6.68	0.479	340,579	70,225	2,669	11,548
6/30	15	St 4	35	20.84	34.53	24.33	1.498	20.8	0.52	1.60	9.85	0.409	456,696	57,687	2,777	22,440
6/30	15	St 4	50	17.41	34.76	25.45	0.642	26.6	0.18	1.93	14.9	0.110	510,379	157,638	7,254	14,562
6/30	15	St 4	70	14.94	34.84	26.17	0.405	30.3	0.07	2.15	20.5	0.234	336,102	71,011	2,379	2,680
6/30	15	St 4	90	13.79	34.84	26.51	0.390	27.2	0.25	1.90	19.3	0.058	171,770	21,719	334	721
6/30	15	St 4	110	13.26	34.83	26.70	0.532	31.3	0.05	2.21	24.8	0.030	144,379	7,523	129	215
6/30	16	St 5	2	27.41	33.23	21.27	4.433	3.02	0.07	0.37	3.35	0.339	797,254	275,186	160,781	19,459
6/30	16	St 5	15	26.10	33.92	22.26	3.910	2.56	0.05	0.38	3.44	0.292	974,695	274,594	173,674	19,437
6/30	16	St 5	25	21.31	34.65	24.26	2.601	12.3	0.18	1.06	7.50	0.331	1,097,506	374,051	117,785	28,811
6/30	16	St 5	30	19.80	34.70	24.72	1.728	19.1	0.34	1.52	11.6	0.374	1,085,689	362,707	65,264	33,331
6/30	16	St 5	45	19.47	34.71	24.88	1.535	21.3	0.40	1.63	13.1	0.288	873,667	417,058	45,235	25,249
6/30	16	St 5	60	14.71	34.81	26.16	0.463	31.1	0.06	2.17	20.2	0.282	345,153	119,152	5,414	4,154
6/30	16	St 5	80	13.57	34.84	26.52	0.363	31.7	0.07	2.25	23.2	0.042	223,343	17,360	1,324	700
6/30	16	St 5	100	13.13	34.86	26.71	0.303	32.1	0.05	2.27	24.4	0.010	285,239	2,583	484	75
7/1	17	St 6	2	27.60	33.67	21.54	4.397	1.40	0.08	0.34	2.66	0.277	1,677,411	292,869	122,466	15,003
7/1	17	St 6	10	27.60	33.67	21.57	4.365	1.36	0.09	0.32	2.10	0.281	983,090	250,755	114,341	18,113
7/1	17	St 6	18	24.01	34.29	23.18	3.358	6.67	0.13	0.69	5.22	0.387	1,098,711	258,375	105,602	26,497
7/1	17	St 6	25	18.23	34.74	25.13	1.479	19.1	0.27	1.56	13.4	0.482	593,078	192,778	88,414	46,117
7/1	17	St 6	35	17.40	34.78	25.40	0.870	24.3	0.30	1.89	15.6	0.439	513,726	195,189	44,471	34,440
7/1	17	St 6	50	15.32	34.85	26.00	0.189	29.5	0.15	2.18	19.5	0.185	580,228	91,212	11,311	3,735
7/1	17	St 6	70	13.75	34.86	26.44	0.105	31.4	0.08	2.30	20.6	0.064	249,023	36,431	1,012	624
7/1	17	St 6	90	13.42	34.87	26.61	0.195	32.5	0.09	2.33	22.9	0.046	496,227	8,438	484	355
7/1	18	St 7	2	28.23	33.70	21.35	4.431	0.86	0.06	0.30	2.33	0.309	830,747	156,573	107,259	8,330
7/1	18	St 7	10	28.11	33.70	21.42	4.422	8.20	3.45	0.19	14.8	0.387	853,111	133,197	106,667	7,663
7/1	18	St 7	22	22.58	34.40	23.69	2.764	12.9	0.16	1.11	9.31	0.465	926,296	129,796	48,797	23,096
7/1	18	St 7	30	18.54	34.73	25.06	1.563	20.4	0.25	1.66	13.8	0.251	698,131	66,319	49,518	33,235
7/1	18	St 7	40	16.74	34.79	25.59	0.895	25.5	0.69	1.98	17.6	0.430	552,514	104,073	41,694	22,526
7/1	18	St 7	50	15.52	34.87	25.97	0.305	30.3	0.17	2.15	20.1	0.378	513,436	105,957	26,034	9,536
7/1	18	St 7	70	14.25	34.86	26.34	0.064	32.2	0.07	2.30	21.4	0.066	362,578	25,593	2,518	1,345
7/1	18	St 7	90	13.41	34.85	26.60	0.084	32.5	0.06	2.38	24.6	0.037	280,040	6,231	1,065	269
7/1	19	St 8	2	28.29	33.66	21.30	4.450	0.89	0.06	0.29	2.48	0.240	815,711	213,302	97,293	14,637

7/1	19	St 8	15	28.16	33.68	21.42	4.430	0.43	0.05	0.27	2.50	0.258	848,472	206,339	104,730	16,671
7/1	19	St 8	25	22.69	34.61	23.84	2.947	6.12	0.84	0.58	4.98	0.434	770,369	219,523	55,782	48,238
7/1	19	St 8	35	19.79	34.69	24.73	1.826	16.7	0.38	1.38	9.49	0.456	649,431	92,977	9,073	39,907
7/1	19	St 8	50	16.37	34.75	25.69	0.485	28.5	0.65	2.22	18.3	0.419	657,083	72,335	15,789	8,061
7/1	19	St 8	70	14.43	34.81	26.26	0.194	29.0	0.12	2.29	19.9	0.150	304,493	50,831	5,693	1,733
7/1	19	St 8	90	13.62	34.81	26.53	0.168	33.1	0.05	2.36	24.3	0.036	201,474	15,369	1,302	807
7/1	19	St 8	110	13.17	34.83	26.72	0.277	32.9	0.06	2.30	24.6	0.006	246,375	3,164	635	226
7/2	20	St 9	2	27.25	33.48	21.51	4.368	3.29	0.06	0.43	4.08	0.314	1,637,870	370,122	204,832	24,130
7/2	20	St 9	15	19.39	34.75	24.80	2.091	16.1	0.20	1.36	10.6	0.505	878,973	382,919	99,101	38,358
7/2	20	St 9	18	18.26	34.77	25.11	1.570	22.2	0.34	1.75	14.8	0.463	1,090,532	429,607	106,409	26,164
7/2	20	St 9	25	16.73	34.79	25.53	0.501	28.8	0.26	2.16	18.3	0.452	755,280	292,353	79,234	38,228
7/2	20	St 9	30	16.16	34.81	25.69	0.472	29.7	0.21	2.20	19.7	0.376	658,331	309,938	61,077	36,377
7/2	20	St 9	40	15.00	34.88	26.05	0.335	30.6	0.12	2.19	20.3	0.240	388,548	169,520	25,303	9,848
7/2	20	St 9	60	14.17	34.90	26.35	0.200	32.0	0.09	2.30	21.7	0.081	237,270	34,289	1,840	1,722
7/2	20	St 9	80	13.77	34.91	26.52	0.187	33.0	0.05	2.32	22.8	0.026	193,994	6,780	581	409
7/2	21	S10	2	27.52	33.51	21.44	4.487	2.90	0.07	0.41	4.18	0.361	1,137,467	329,343	171,726	12,086
7/2	21	S10	10	27.45	33.51	21.49	4.434	2.53	0.09	0.40	3.05	0.442	1,363,921	331,851	201,506	12,097
7/2	21	S10	20	22.64	34.37	23.65	2.833	13.2	0.19	1.14	8.26	0.586	1,100,498	296,841	113,049	15,918
7/2	21	S10	25	18.85	34.74	24.97	1.663	20.1	0.28	1.62	12.7	0.498	882,503	276,607	85,573	29,199
7/2	21	S10	30	17.17	34.81	25.46	1.005	25.5	0.39	1.93	16.6	0.421	636,010	214,809	56,040	11,462
7/2	21	S10	40	15.34	34.84	25.95	0.344	30.2	0.17	2.22	19.5	0.368	569,455	104,859	34,160	5,629
7/2	21	S10	55	14.24	34.88	26.29	0.172	32.3	0.09	2.31	21.9	0.142	339,837	51,843	4,596	1,905
7/2	21	S10	70	13.67	34.87	26.47	0.098	33.3	0.08	2.35	23.6	0.026	152,128	4,692	786	301
7/2	22	S11	2	28.03	33.68	21.40	4.449	0.54	0.08	0.28	2.02	0.416	1,190,289	466,275	160,587	12,614
7/2	22	S11	10	28.01	33.72	21.47	4.453	0.66	0.09	0.30	2.02	0.403	1,487,517	501,554	187,246	16,294
7/2	22	S11	20	23.24	34.33	23.44	3.009	10.3	0.13	0.93	7.33	0.713	1,308,655	492,761	180,401	24,291
7/2	22	S11	30	17.89	34.78	25.26	1.110	23.7	0.44	1.86	15.0	0.412	1,025,128	386,288	99,607	19,383
7/2	22	S11	40	16.24	34.83	25.74	0.490	29.6	0.16	2.18	17.9	0.396	336,629	184,383	13,658	9,988
7/2	22	S11	50	15.25	34.83	26.01	0.446	30.2	0.13	2.26	19.7	0.202	156,562	130,915	5,941	3,390
7/2	22	S11	70	13.85	34.83	26.40	0.411	31.9	0.06	2.29	23.0	0.133	342,463	37,303	1,399	1,281
7/2	22	S11	90	13.14	34.81	26.62	0.586	31.3	0.04	2.50	24.9	0.030	151,181	9,105	312	484
7/3	23	S12	2	27.62	33.58	21.46	4.415	2.86	0.10	0.47	3.85		1,506,535	377,398	152,634	21,019

7/3	23	S12	10	27.28	33.63	21.64	4.353	2.99	0.11	0.46	4.09		1,309,129	359,963	139,181	26,422	
7/3	23	S12	20	24.40	34.14	22.95	3.143	10.9	0.34	1.05	6.88		1,499,711	493,138	97,670	38,067	
7/3	23	S12	30	18.54	34.69	25.03	0.972	25.8	0.28	2.00	15.2		1,120,096	497,055	63,101	20,739	
7/3	23	S12	40	16.29	34.81	25.71	0.507	29.0	0.43	2.22	18.4		773,695	197,277	43,093	11,322	
7/3	23	S12	50	14.71	34.81	26.12	0.176	31.8	0.19	2.36	21.3		364,063	153,882	17,403	5,048	
7/3	23	S12	70	13.70	34.85	26.45	0.115	32.7	0.08	2.38	23.5		323,338	43,330	2,508	1,216	
7/3	23	S12	90	13.35	34.87	26.63	0.218	32.9	0.05	2.35	23.8		213,959	6,253	560	323	
7/3	24	S13	2	27.90	33.60	21.39	4.419	1.50	0.05	0.36	2.36		1,019,230	236,678	63,649	6,328	
7/3	24	S13	10	27.85	33.76	21.56	4.391	1.37	0.06	0.36	2.20		894,073	237,830	57,848	10,978	
7/3	24	S13	20	20.28	34.66	24.51	2.106	17.1	0.19	1.46	11.4		834,223	171,113	43,050	23,441	
7/3	24	S13	30	17.81	34.76	25.27	0.966	23.7	0.47	1.89	15.0		602,054	128,246	24,937	25,744	
7/3	24	S13	40	16.60	34.80	25.63	0.317	29.5	0.13	2.25	17.7		648,032	219,544	35,247	15,455	
7/3	24	S13	50	15.09	34.83	26.04	0.083	32.0	0.03	2.42	21.2		465,973	136,469	12,194	3,455	
7/3	24	S13	65	14.09	34.84	26.33	0.164	32.4	0.07	2.38	22.8		249,668	58,946	2,368	1,991	
7/3	24	S13	80	13.48	34.86	26.55	0.203	33.4	0.03	2.39	24.3		445,675	15,509	936	560	
7/4	25	Cy2	2	27.50	33.49	21.43	4.432	2.31	0.07	0.40	3.23	0.293	1,501,343	133,541	207,630	14,120	106.10
7/4	25	Cy2	12	27.47	33.50	21.49	4.398	2.55	0.10	0.42	3.29	0.259	1,662,124	119,830	218,651	16,800	72.77
7/4	25	Cy2	20	19.62	34.69	24.72	1.968	17.6	0.17	1.44	11.8	0.304	1,421,818	164,279	122,886	25,755	42.43
7/4	25	Cy2	30	17.21	34.79	25.43	0.914	25.8	0.44	1.95	16.9	0.367	1,185,122	224,441	120,615	17,231	13.13
7/4	25	Cy2	40	15.99	34.82	25.78	0.394	29.8	0.41	2.29	19.1	0.378	698,788	101,232	59,215	13,227	4.33
7/4	25	Cy2	50	14.98	34.83	26.06	0.205	31.8	0.25	2.36	20.8	0.264	484,982	43,933	20,632	5,295	1.22
7/4	25	Cy2	60	14.37	34.84	26.25	0.120	32.5	0.09	2.38	23.1	0.139	325,316	30,146	4,133	1,873	0.37
7/4	25	Cy2	80	13.64	34.87	26.52	0.112	33.6	0.05	2.41	33.0	0.038	216,668	2,077	710	129	0.04
7/5	30	Cy2	2	27.58	33.57	21.47	4.399	1.53	0.08	0.36	2.52	0.268	640,973	133,121	242,716	15,799	35.68
7/5	30	Cy2	12	24.55	34.11	22.86	3.497	8.17	0.06	0.81	6.58	0.323	762,326	126,212	220,287	29,328	43.80
7/5	30	Cy2	20	18.80	34.75	24.97	1.621	22.4	0.25	1.76	14.7	0.481	633,465	131,948	98,240	38,842	28.09
7/5	30	Cy2	30	16.70	34.82	25.58	0.804	27.5	0.40	2.08	18.3	0.424	373,853	121,896	80,299	15,864	14.45
7/5	30	Cy2	40	15.23	34.83	25.97	0.467	29.8	0.37	2.23	21.3	0.272	412,716	77,598	78,222	8,599	5.50
7/5	30	Cy2	50	14.64	34.84	26.15	0.175	31.0	0.10	2.12	21.3	0.110	160,729	48,765	14,163	3,584	1.44
7/5	30	Cy2	60	14.04	34.84	26.33	0.096	31.7	0.09	2.20	22.0	0.090	118,322	30,802	5,919	1,894	0.30
7/5	30	Cy2	80	13.44	34.88	26.57	0.250	31.7	0.04	2.15	22.4	0.029	89,408	2,131	344	151	0.07
7/6	33	Cy2	2	27.70	33.58	21.43	4.484	1.53	0.08	0.24	2.88	0.277	1,437,358	58,494	244,298	16,962	67.82

7/6	33	Cy2	12	27.71	33.58	21.48	4.460	1.68	0.05	0.24	2.87	0.255	1,711,146	57,795	269,590	17,328	43.21
7/6	33	Cy2	20	24.34	34.14	22.98	3.447	10.0	0.08	0.74	7.02	0.285	1,446,939	67,954	195,264	35,269	25.07
7/6	33	Cy2	30	19.80	34.71	24.72	1.955	19.9	0.22	1.40	12.4	0.385	1,559,657	112,565	136,016	43,373	13.78
7/6	33	Cy2	40	16.03	34.81	25.77	0.556	29.3	0.40	2.05	18.7	0.300	943,688	83,366	71,926	17,457	3.56
7/6	33	Cy2	50	14.87	34.84	26.10	0.276	27.0	0.07	2.04	18.6	0.155	591,347	43,244	23,333	4,983	0.97
7/6	33	Cy2	60	14.17	34.87	26.32	0.200	31.9	0.02	2.13	21.6	0.086	435,881	24,614	3,659	1,711	0.33
7/6	33	Cy2	80	13.51	34.88	26.56	0.214	32.3	0.02	2.16	22.9	0.021	305,379	1,830	624	248	0.04
7/7	37	Cy2	2	27.75	33.33	21.23	4.470	1.49	0.08	0.23	2.64	0.250	1,078,823	158,704	308,163	19,190	
7/7	37	Cy2	12	27.60	33.62	21.54	4.404	5.89	0.08	0.50	4.93	0.265	1,410,570	166,399	250,605	26,185	15.25
7/7	37	Cy2	20	20.49	34.62	24.43	2.319	16.9	0.15	1.22	11.7	0.263	1,029,669	136,275	94,312	36,420	8.57
7/7	37	Cy2	30	17.17	34.78	25.43	1.044	25.7	0.09	1.76	17.1	0.409	980,713	267,330	102,405	32,922	7.25
7/7	37	Cy2	40	15.96	34.83	25.81	0.406	28.8	0.28	2.05	19.7	0.330	643,991	137,674	74,487	24,076	2.22
7/7	37	Cy2	50	14.79	34.83	26.11	0.117	25.5	0.36	1.83	17.5	0.113	222,193	67,180	18,350	4,983	0.72
7/7	37	Cy2	60	14.21	34.83	26.28	0.153	31.5	0.05	2.19	22.3	0.090	172,331	37,669	3,369	2,540	0.28
7/7	37	Cy2	80	13.55	34.88	26.54	0.196	31.9	0.04	2.15	23.0	0.028	137,498	2,766	592	355	-0.01
7/8	40	Cy2	2	27.65	33.55	21.43	4.329	1.10	0.02	0.22	2.63	0.182	803,022	82,290	45,611	11,118	
7/8	40	Cy2	12	27.66	33.55	21.46	4.313	1.48	0.05	0.25	3.08	0.177	803,302	120,680	37,389	11,010	
7/8	40	Cy2	20	25.70	33.93	22.41	3.657	9.28	0.12	0.69	6.99	0.166	1,002,774	115,826	57,795	10,698	
7/8	40	Cy2	30	18.72	34.72	25.01	1.155	24.5	0.20	1.72	15.4	0.249	1,077,660	257,202	48,679	22,601	
7/8	40	Cy2	40	16.93	34.80	25.56	0.814	27.2	0.37	1.86	17.6	0.240	633,728	125,372	32,406	12,043	
7/8	40	Cy2	50	15.31	34.83	25.99	0.258	29.9	0.21	2.10	19.7	0.212	653,768	257,159	72,335	15,864	
7/8	40	Cy2	60	14.27	34.83	26.27	0.150	31.3	0.06	2.13	22.1	0.100	317,203	110,660	9,794	4,036	
7/8	40	Cy2	80	13.63	34.87	26.52	0.123	31.9	0.02	2.15	23.2	0.051	161,771	35,549	2,066	1,324	
7/9	41	Cy3	2	28.06	33.47	21.24	4.490	0.39	0.10	0.22	2.11	0.161	825,917	13,227	120,723	14,540	40.38
7/9	41	Cy3	12	28.05	33.52	21.32	4.463	0.75	0.11	0.24	2.91	0.161	911,925	13,894	109,358	16,187	20.91
7/9	41	Cy3	20	27.31	33.92	21.89	4.108	2.45	0.26	0.37	2.52	0.183	831,062	12,721	46,193	12,667	27.60
7/9	41	Cy3	30	18.75	34.62	24.92	0.634	26.7	0.19	1.99	14.5	0.155	259,744	9,955	3,153	14,572	7.72
7/9	41	Cy3	45	15.40	34.86	25.98	0.308	29.8	0.14	2.04	19.4	0.166	198,109	32,966	6,318	5,844	3.39
7/9	41	Cy3	60	14.95	34.89	26.17	0.178	31.3	0.05	2.11	24.1	0.098	176,505	23,947	2,400	2,508	0.57
7/9	41	Cy3	80	13.89	34.86	26.46	0.164	30.8	0.11	2.15	20.4	0.032	145,937	11,075	796	775	0.21
7/9	41	Cy3	100	13.48	34.86	26.64	0.158	32.2	0.07	2.18	23.3	0.025	135,949	4,240	248	527	0.18
7/10	45	Cy3	2	28.03	33.56	21.31	4.481	0.54	0.06	0.25	4.38	0.198	498,094	14,723	69,547	20,083	41.06

7/10	45	Cy3	12	28.03	33.60	21.39	4.444	0.72	0.07	0.26	1.65	0.210	525,932	15,283	66,093	20,190	51.32
7/10	45	Cy3	20	26.39	34.12	22.34	3.723	4.54	0.61	0.55	2.60	0.249	449,649	14,207	37,852	15,832	24.05
7/10	45	Cy3	30	20.02	34.55	24.54	0.751	23.9	0.47	1.79	11.6	0.299	251,383	13,711	4,423	29,661	8.86
7/10	45	Cy3	45	15.92	34.84	25.84	0.459	28.9	0.20	2.03	18.8	0.225	142,931	31,577	7,125	8,050	2.29
7/10	45	Cy3	60	14.55	34.85	26.23	0.191	31.1	0.09	2.20	21.6	0.110	112,350	24,216	2,992	2,346	0.53
7/10	45	Cy3	80	13.79	34.86	26.49	0.084	31.7	0.04	2.17	23.8	0.032	94,172	9,988	667	570	0.39
7/10	45	Cy3	100	13.41	34.87	26.66	0.099	32.2	0.05	2.21	24.2	0.014	89,814	1,679	323	291	-0.15
7/11	48	Cy3	2	28.27	33.46	21.16	4.452	0.86	0.10	0.25	1.95	0.174	274,549	32,481	55,179	23,301	46.54
7/11	48	Cy3	12	28.00	33.64	21.42	4.445	0.90	0.10	0.26	1.94	0.199	362,106	32,793	58,666	27,767	42.70
7/11	48	Cy3	20	24.99	34.26	22.87	3.068	10.4	1.12	0.94	5.54	0.281	382,869	27,649	29,414	22,472	21.16
7/11	48	Cy3	30	18.75	34.62	24.92	0.361	27.5	0.10	2.04	15.1	0.471	386,190	94,807	59,775	33,827	7.13
7/11	48	Cy3	45	15.82	34.84	25.86	0.441	29.6	0.13	2.05	18.0	0.246	131,119	35,990	8,201	9,170	2.78
7/11	48	Cy3	60	15.06	34.89	26.14	0.187	30.5	0.11	2.14	20.0	0.112	91,403	21,536	2,561	2,766	0.46
7/11	48	Cy3	80	14.16	34.87	26.40	0.154	31.2	0.02	2.22	21.9	0.067	95,117	16,456	1,152	1,345	0.16
7/11	48	Cy3	100	13.68	34.86	26.60	0.163	31.8	0.01	2.14	23.0	0.032	78,396	7,921	409	495	0.05
7/12	53	Cy3	2	28.30	33.45	21.14	4.487	0.54	0.06	0.24	1.77	0.275	409,290	61,583	80,493	26,390	56.25
7/12	53	Cy3	12	27.89	33.71	21.51	4.363	1.01	0.11	0.28	1.74	0.232	537,390	66,620	79,449	24,635	33.79
7/12	53	Cy3	20	26.00	34.15	22.48	3.586	7.49	0.75	0.69	4.03	0.419	827,610	74,982	52,973	31,954	24.66
7/12	53	Cy3	30	19.05	34.61	24.84	1.013	24.8	0.45	1.82	13.5	0.352	259,744	22,741	3,100	40,037	2.05
7/12	53	Cy3	45	15.47	34.84	25.94	0.363	29.9	0.17	2.09	19.5	0.143	104,488	19,760	5,683	7,125	
7/12	53	Cy3	60	14.57	34.88	26.24	0.147	31.4	0.11	2.16	21.4	0.092	77,241	28,391	1,679	2,163	0.07
7/12	53	Cy3	80	13.88	34.87	26.46	0.138	31.9	0.04	2.20	22.6	0.062	68,591	13,776	839	657	0.38
7/12	53	Cy3	100	13.33	34.85	26.66	0.071	32.4	0.04	2.27	24.4	0.012	76,374	2,454	366	118	0.09
7/13	56	Cy3	2	28.14	33.59	21.30	4.461	0.55	0.08	0.25	1.40	0.358	1,359,659	94,280	112,662	32,094	
7/13	56	Cy3	12	27.82	33.78	21.59	4.349	1.54	0.16	0.31	1.67	0.325	1,207,079	89,888	106,710	30,113	
7/13	56	Cy3	20	23.88	34.31	23.24	2.446	13.4	1.36	1.15	5.52	0.500	1,059,557	86,218	42,985	47,409	
7/13	56	Cy3	30	20.10	34.54	24.52	0.827	24.9	0.31	1.88	12.2	0.389	701,769	38,810	9,708	70,204	
7/13	56	Cy3	45	16.56	34.80	25.66	0.334	29.5	0.14	2.07	18.0	0.282	454,963	46,139	5,693	13,722	
7/13	56	Cy3	60	14.94	34.80	26.10	0.056	30.8	0.10	2.31	21.9	0.068	207,942	59,969	2,422	1,453	
7/13	56	Cy3	80	14.23	34.87	26.39	0.241	31.0	0.04	2.15	21.7	0.147	362,147	59,592	1,711	2,583	
7/13	56	Cy3	100	13.62	34.87	26.61	0.065	31.4	0.03	2.20	23.9	0.024	197,040	13,001	517	495	
7/15	57	Cy4	2	27.68	33.44	21.33	4.364	1.60	0.05	0.28	2.94	0.136	569,244	104,601	94,172	10,224	

7/15	57	Cy4	12	27.70	33.45	21.38	4.332	1.62	0.06	0.25	2.89	0.152	442,326	110,305	90,771	10,289	14.45
7/15	57	Cy4	20	24.73	34.43	23.08	3.249	7.03	0.36	0.66	4.39	0.139	396,782	111,284	29,984	11,075	15.96
7/15	57	Cy4	30	20.18	34.67	24.59	2.010	18.5	0.28	1.40	12.0	0.216	521,863	105,376	69,655	29,866	7.06
7/15	57	Cy4	40	16.69	34.80	25.61	0.659	26.9	0.14	1.95	16.8	0.358	456,921	110,531	69,547	22,655	10.24
7/15	57	Cy4	50	15.44	34.84	25.97	0.314	30.0	0.20	2.09	19.7	0.163	336,840	57,300	25,195	6,974	2.65
7/15	57	Cy4	60	14.16	34.83	26.29	0.161	31.5	0.06	2.19	22.3	0.072	159,180	44,783	4,563	1,787	0.66
7/15	57	Cy4	80	13.39	34.86	26.56	0.166	32.4	0.04	2.25	24.2	0.031	113,741	3,842	549	280	-0.01
7/16	61	Cy4	2	27.90	33.46	21.28	4.351	0.85	0.04	0.25	2.23	0.160	274,444	111,790	67,868	7,824	18.54
7/16	61	Cy4	12	27.89	33.46	21.33	4.335	1.15	0.07	0.25	2.41	0.158	231,788	121,767	70,258	7,566	21.41
7/16	61	Cy4	20	23.52	34.58	23.55	2.815	10.5	0.49	0.88	6.09	0.080	117,311	115,288	12,097	5,478	6.65
7/16	61	Cy4	30	18.71	34.72	25.02	1.503	22.2	0.33	1.58	14.2	0.130	129,281	125,319	25,141	9,912	4.73
7/16	61	Cy4	40	16.38	34.82	25.70	0.595	27.8	0.24	1.92	17.8	0.307	199,119	152,225	132,260	18,361	6.17
7/16	61	Cy4	50	15.59	34.84	25.94	0.365	29.8	0.16	2.06	19.1	0.303	135,056	113,932	97,519	15,606	2.02
7/16	61	Cy4	60	14.61	34.84	26.20	0.226	31.1	0.11	2.17	21.1	0.118	46,594	49,916	11,893	4,617	-0.30
7/16	61	Cy4	80	13.71	34.88	26.51	0.205	32.2	0.04	2.13	22.5	0.044	40,005	13,528	1,109	775	-0.11
7/17	64	Cy4	2	27.69	33.45	21.35	4.301	1.31	0.07	0.27	2.50	0.185	133,114	16,262	30,436	7,383	33.12
7/17	64	Cy4	12	27.69	33.45	21.38	4.276	1.46	0.12	0.28	2.50	0.188	136,421	16,111	30,533	6,651	37.05
7/17	64	Cy4	20	23.86	34.53	23.41	3.077	9.55	0.45	0.81	5.94	0.322	103,937	15,261	28,596	15,207	25.70
7/17	64	Cy4	30	18.15	34.74	25.17	1.319	23.0	0.23	1.63	14.9	0.342	142,879	105,171	57,041	27,972	14.77
7/17	64	Cy4	40	15.51	34.85	25.92	0.332	29.7	0.12	2.13	19.1	0.367	59,798	113,813	81,311	16,940	7.72
7/17	64	Cy4	50	14.68	34.84	26.14	0.208	31.2	0.08	2.21	21.7	0.158	42,919	65,737	13,830	4,962	1.20
7/17	64	Cy4	60	14.19	34.83	26.28	0.182	31.7	0.07	2.21	22.3	0.207	39,257	43,803	4,413	2,325	0.59
7/17	64	Cy4	80	13.77	34.87	26.49	0.173	32.1	0.07	2.22	23.0	0.057	27,523	19,857	1,162	1,162	0.02
7/18	67	Cy4	2	27.22	33.63	21.62	4.290	1.46	0.14	0.28	3.01	0.315	199,723	29,048	121,164	19,642	84.86
7/18	67	Cy4	12	26.53	33.73	21.97	3.976	4.27	0.12	0.46	3.99	0.297	234,636	33,601	114,104	20,750	43.48
7/18	67	Cy4	20	19.52	34.61	24.67	1.306	23.2	0.26	1.70	12.8	0.284	198,358	39,498	24,829	22,268	20.38
7/18	67	Cy4	30	16.29	34.77	25.64	0.514	28.3	0.17	2.04	18.5	0.384	228,283	172,103	107,033	28,714	17.90
7/18	67	Cy4	40	14.68	34.81	26.07	0.173	30.9	0.07	2.22	21.2	0.081	91,061	98,326	20,922	7,910	4.65
7/18	67	Cy4	50	14.37	34.82	26.19	0.154	31.6	0.06	2.24	22.0	0.066	55,794	43,599	5,801	2,938	0.15
7/18	67	Cy4	60	13.92	34.86	26.36	0.178	29.6	0.04	2.07	21.4	0.053	42,000	9,116	1,754	807	0.24
7/18	67	Cy4	80	13.54	34.88	26.55	0.193	31.9	0.05	2.23	23.0	0.019	36,501	3,939	657	366	0.93
7/19	70	Cy4	2	26.75	33.60	21.76	4.290	2.25	0.10	0.31	2.86	0.512	798,115	127,902	106,753	17,855	

7/19	70	Cy4	12	26.61	33.72	21.93	4.166	3.08	0.14	0.38	3.62	0.450	812,278	130,614	103,094	19,588	
7/19	70	Cy4	20	24.67	34.00	22.77	3.400	8.11	0.14	0.67	6.25	0.387	809,717	161,276	105,236	17,446	
7/19	70	Cy4	30	16.98	34.76	25.47	0.805	27.2	0.10	1.95	17.1	0.297	988,665	559,704	146,338	21,773	
7/19	70	Cy4	40	15.05	34.80	25.99	0.189	31.0	0.08	2.23	21.1	0.260	724,359	270,397	38,799	8,965	
7/19	70	Cy4	50	14.28	34.84	26.22	0.183	31.2	0.13	2.25	21.9	0.125	305,956	116,978	8,330	3,100	
7/19	70	Cy4	60	13.95	34.85	26.35	0.131	32.1	0.06	2.24	22.7	0.087	356,658	55,427	3,057	1,733	
7/19	70	Cy4	80	13.50	34.89	26.57	0.229	32.1	0.03	2.09	23.5	0.025	271,721	5,198	527	280	
7/20	71	Cy5	2	27.45	33.53	21.47	4.290	1.89	0.12	0.29	3.05	0.125	212,979	65,511	24,528	6,210	33.59
7/20	71	Cy5	12	27.44	33.52	21.52	4.280	2.08	0.15	0.30	2.56	0.125	214,292	62,659	23,075	6,124	33.06
7/20	71	Cy5	20	24.17	34.15	23.04	2.708	14.2	0.64	1.07	6.88	0.108	134,938	64,155	4,391	6,092	15.42
7/20	71	Cy5	25	21.15	34.49	24.17	1.629	20.9	0.49	1.47	10.7	0.105	148,509	70,182	979	4,714	5.97
7/20	71	Cy5	40	16.46	34.78	25.65	1.338	23.9	0.81	1.71	17.1	0.295	175,770	100,974	8,987	17,155	13.92
7/20	71	Cy5	50	15.48	34.82	25.94	0.976	27.0	0.63	1.88	19.3	0.255	153,720	54,168	6,092	9,008	4.83
7/20	71	Cy5	70	14.58	34.92	26.31	0.492	30.1	0.04	2.03	19.9	0.126	82,123	19,674	893	2,196	1.25
7/20	71	Cy5	90	14.31	34.93	26.47	0.575	29.6	0.06	2.01	19.7	0.050	69,326	8,276	237	646	1.17
7/21	75	Cy5	2	27.48	33.51	21.45	4.328	1.66	0.15	0.31	2.40	0.130	178,408	3,853	22,117	6,156	37.35
7/21	75	Cy5	12	27.49	33.51	21.49	4.309	1.75	0.15	0.31	2.34	0.126	175,718	4,585	20,287	5,414	33.81
7/21	75	Cy5	20	27.48	33.51	21.52	4.271	2.08	0.13	0.33	2.82	0.142	165,165	4,553	20,998	5,962	19.34
7/21	75	Cy5	30	20.69	34.62	24.42	1.984	19.3	0.53	1.49	10.6	0.150	117,298	8,233	2,325	7,006	15.76
7/21	75	Cy5	40	17.90	34.77	25.30	1.856	21.5	0.40	1.57	14.0	0.177	155,479	14,551	1,388	8,180	9.80
7/21	75	Cy5	50	16.00	34.82	25.83	1.113	24.9	0.89	1.82	17.3	0.179	127,536	17,155	1,162	6,318	4.63
7/21	75	Cy5	70	14.83	34.87	26.22	0.711	28.8	0.05	2.00	20.2	0.170	77,319	20,944	1,657	3,035	1.45
7/21	75	Cy5	100	14.25	34.94	26.53	0.429	27.2	0.09	1.98	17.9	0.067	56,333	4,079	323	603	0.35
7/22	78	Cy5	2	27.57	33.50	21.42	4.359	1.93	0.14	0.33	2.69	0.177	361,371	17,134	27,853	12,302	67.70
7/22	78	Cy5	12	27.54	33.50	21.47	4.339	1.93	0.11	0.32	3.31	0.177	410,603	16,036	28,811	13,335	55.04
7/22	78	Cy5	20	27.40	33.52	21.56	4.317	2.84	0.16	0.37	3.16	0.212	379,129	16,273	40,908	12,108	48.66
7/22	78	Cy5	30	22.79	34.37	23.64	2.160	17.1	0.60	1.31	8.42	0.149	364,875	17,823	3,336	12,291	10.29
7/22	78	Cy5	40	19.36	34.66	24.85	1.861	19.8	0.41	1.51	11.7	0.129	331,170	16,036	1,507	10,031	8.20
7/22	78	Cy5	50	17.60	34.75	25.40	1.702	21.2	0.52	1.60	14.9	0.161	352,052	27,154	334	11,322	4.57
7/22	78	Cy5	70	15.25	34.86	26.12	0.795	28.4	0.09	2.03	18.7	0.167	188,882	25,195	2,185	7,394	1.48
7/22	78	Cy5	100	14.35	34.93	26.50	0.640	29.5	0.05	2.07	19.9	0.056	92,754	10,666	570	1,485	4.49
7/23	82	Cy5	2	27.72	33.50	21.37	4.407	1.69	0.10	0.32	2.39	0.248	465,531	30,813	45,429	14,314	40.34

7/23	82	Cy5	12	27.69	33.50	21.42	4.382	1.78	0.12	0.32	2.24	0.217	414,369	30,609	46,246	11,645	27.65
7/23	82	Cy5	20	27.09	33.58	21.71	4.114	2.78	0.17	0.38	2.51	0.265	440,055	34,892	39,541	10,870	34.14
7/23	82	Cy5	30	19.78	34.66	24.69	1.743	20.6	0.49	1.59	11.7	0.187	331,551	14,163	2,153	6,533	8.15
7/23	82	Cy5	40	17.50	34.74	25.37	1.621	21.6	0.38	1.65	16.6	0.198	282,384	15,918	603	7,566	3.87
7/23	82	Cy5	50	16.18	34.81	25.78	1.082	25.6	0.38	1.91	17.3	0.201	183,737	12,969	861	4,897	2.47
7/23	82	Cy5	70	14.55	34.92	26.32	0.456	30.2	0.05	2.11	19.6	0.147	132,523	23,312	560	1,582	-15.88
7/23	82	Cy5	100	14.06	34.93	26.57	0.678	27.9	0.05	1.98	18.9	0.052	111,195	3,584	248	334	-1.55
7/24	85	Cy5	2	27.74	33.52	21.38	4.405	1.45	0.11	0.30	2.40	0.283	626,528	118,269	77,684	19,523	
7/24	85	Cy5	12	27.74	33.52	21.42	4.386	1.52	0.10	0.31	2.18	0.306	650,647	103,331	74,606	17,780	
7/24	85	Cy5	20	27.73	33.52	21.45	4.379	1.50	0.10	0.30	2.35	0.312	616,347	103,772	67,965	16,434	
7/24	85	Cy5	30	27.27	33.54	21.66	4.171	18.3	0.70	1.43	8.93	0.371	719,376	91,492	55,502	17,877	
7/24	85	Cy5	40	21.66	34.52	24.12	1.985	21.5	0.49	1.61	14.5	0.341	764,460	60,496	4,531	16,004	
7/24	85	Cy5	50	17.56	34.75	25.41	1.734	28.4	0.10	1.93	18.6	0.357	551,115	77,156	990	11,806	
7/24	85	Cy5	70	15.29	34.89	26.13	0.653	28.4	0.11	1.98	18.2	0.309	309,842	66,448	904	4,423	
7/24	85	Cy5	100	14.42	34.94	26.49	0.557	28.1	0.06	1.92	18.9	0.094	185,330	30,146	269	1,216	

Table 2. Size-fractioned and total mesozooplankton biomass (dry weight m^{-2}) by cruise event # (see Appendix 1), date/time, location and depth of tow.

			Lat	Long	depth	Mezozooplankton Size Fraction Dry Wt (g m^{-2})					
Event #	Local date	Local time	°N	°W	m	>5 mm	2-5 mm	1-2 mm	0.5-1 mm	0.2-0.5 mm	TOTAL
14	23-Jun	22:18	9.486	87.012	160	0.21	0.87	1.79	1.32	1.83	6.01
35	24-Jun	13:25	9.713	86.942	160	1.61	0.26	0.77	1.17	1.41	5.21
55	25-Jun	00:15	9.663	86.879	152	0.18	0.88	1.33	1.18	1.01	4.57
76	25-Jun	11:38	9.618	86.867	198	0.15	0.80	1.28	2.01	1.59	5.84
85	25-Jun	21:05	9.606	86.851	194	0.45	1.19	0.90	0.86	0.79	4.18
101	26-Jun	12:05	9.601	86.806	194	0.21	0.09	0.64	1.25	1.14	3.32
123	29-Jun	23:33	9.580	86.735	174	1.36	1.07	1.52	1.78	1.56	7.29
134	29-Jun	17:55	6.628	88.497	160	0.41	0.48	0.77	0.72	0.78	3.15
145	30-Jun	00:36	6.998	89.002	155	0.21	0.60	1.03	0.71	0.72	3.27
154	30-Jun	07:22	7.501	89.493	133	0.00	0.10	0.52	0.49	1.10	2.21
169	30-Jun	14:24	8.000	89.995	152	0.03	0.13	0.61	0.26	0.68	1.71
181	30-Jun	20:56	8.501	90.497	202	0.50	2.32	1.34	1.18	1.31	6.65
193	1-Jul	03:50	8.996	90.997	126	0.29	1.76	2.07	0.65	1.05	5.82
202	1-Jul	10:07	9.497	91.499	126	0.01	0.33	1.03	0.72	1.18	3.28
215	1-Jul	18:27	9.998	92.000	151	0.02	0.58	1.23	0.79	1.30	3.92
230	2-Jul	06:10	9.495	90.511	130	0.16	0.65	1.11	1.03	1.26	4.20
247	2-Jul	12:50	8.995	90.510	153	0.10	0.39	0.87	0.78	1.78	3.92
261	2-Jul	18:15	8.497	90.502	145	0.83	1.20	1.15	0.88	0.91	4.98
274	3-Jul	00:45	9.008	89.993	132	0.28	0.96	0.84	0.54	1.24	3.86
288	3-Jul	08:36	8.997	90.999	129	1.92	3.14	6.03	3.23	5.97	20.30
301	3-Jul	22:29	9.042	90.560	150	0.29	2.12	2.38	0.75	1.61	7.14
326	9-Jul	11:53	9.045	90.545	143	0.03	0.25	0.54	0.47	0.68	1.98
359	4-Jul	00:10	9.041	90.507	113	0.25	1.91	2.31	1.17	1.35	6.99
391	5-Jul	13:01	9.008	90.505	140	0.16	0.91	1.01	0.45	0.99	3.52
411	5-Jul	22:35	8.971	90.498	144	0.57	2.02	1.25	0.86	1.16	5.86
434	6-Jul	14:13	8.976	90.544	160	0.38	0.31	1.15	0.96	1.07	3.87
449	6-Jul	21:35	8.941	90.549	176	0.95	2.66	1.52	1.11	1.75	7.99
467	7-Jul	10:52	8.996	90.492	134	0.32	0.39	0.75	0.74	0.91	3.10
496	7-Jul	23:55	8.961	90.378	143	0.66	1.27	2.09	0.88	1.16	6.06
531	9-Jul	11:00	10.300	92.893	113	0.33	0.48	1.46	1.45	1.73	5.45
559	9-Jul	22:45	10.210	92.923	117	0.18	0.86	1.29	0.80	1.60	4.73
582	10-Jul	12:19	10.124	92.987	164	0.12	0.47	1.37	0.70	1.33	4.00
604	10-Jul	22:47	10.126	92.987	170	0.37	3.76	2.63	1.99	2.76	11.52
630	11-Jul	13:15	10.090	92.932	150	0.14	0.21	1.10	1.16	1.84	4.46
658	11-Jul	21:37	10.039	92.917	160	0.17	2.05	1.99	0.70	1.13	6.04
679	12-Jul	11:08	9.923	92.930	111	0.02	0.21	0.50	0.42	0.59	1.73
710	12-Jul	22:35	9.838	92.923	170	0.15	0.98	1.48	0.87	1.83	5.32
729	14-Jul	23:20	8.560	90.328	170	0.10	1.15	1.72	0.90	1.53	5.40
752	15-Jul	11:18	8.570	90.365	166	0.49	0.59	0.73	1.51	1.52	4.84
784	16-Jul	00:18	8.536	90.318	166	0.60	2.51	3.01	1.74	0.97	8.82
811	16-Jul	12:32	8.506	90.330	156	0.00	0.23	1.06	0.90	0.80	2.99
838	16-Jul	21:54	8.514	90.330	150	0.24	3.29	1.92	1.33	1.72	8.50
869	17-Jul	13:14	8.556	90.326	162	0.04	0.16	0.66	0.68	0.77	2.29
890	17-Jul	21:41	8.573	90.243	160	0.81	1.90	1.52	1.02	2.13	7.38
913	18-Jul	11:16	8.533	90.072	142	0.12	0.21	0.80	0.75	0.85	2.73
946	18-Jul	23:32	8.392	89.994	100	0.92	1.05	2.12	1.62	1.63	7.33
956	19-Jul	22:32	8.875	88.466	178	0.25	1.56	2.07	1.47	2.05	7.40
974	20-Jul	11:09	8.984	88.380	164	2.63	0.24	0.79	0.89	0.95	5.50

999	20-Jul	23:22	9.048	88.243	164	0.63	1.72	2.04	1.64	2.08	8.12
1017	21-Jul	13:08	9.137	88.022	135	0.02	0.20	0.81	0.72	1.36	3.11
1043	21-Jul	21:14	9.102	87.973	132	0.00	0.80	1.54	1.41	1.96	5.71
1060	22-Jul	13:42	9.203	87.799	160	0.03	0.20	0.76	0.66	1.48	3.13
1073	22-Jul	21:31	9.262	87.746	146	0.07	0.57	1.30	1.25	1.52	4.71
1089	23-Jul	10:50	9.399	87.614	164	0.00	0.38	0.80	1.16	1.42	3.76
1109	23-Jul	23:05	9.500	87.476	150	0.12	0.68	1.12	1.33	1.19	4.44

Table 3. Depth-integrated process rate estimates for Cycles 2-5. Estimates of phytoplankton community rates of Chl*a* production and microzooplankton grazing are from dilution experiments. Mesozooplankton grazing estimates are from gut fluorescence (day/night net collections). Rate estimates of pigment, carbon and nitrogen export are from particulates collected in sediment traps at depths of 90 or 150 m. Data summary is from Stukel et al. (Prog. Oceanogr., in review).

	Chl*a*-based Process Rate (mg m^{-2} d^{-1})			Trap	Export Rates (mg m^{-2} d^{-1})		
Cycle	Production	Micro-Graz	Meso-Graz	Depth (m)	Phaeo	Carbon	Nitrogen
2	9.2 ± 0.8	5.7 ± 0.4	2.08 ± 0.33	90	0.37 ± 0.04	63.9 ± 18.3	7.4 ± 0.9
				150	0.27 ± 0.02	50.7 ± 7.3	6.5 ± 0.3
3	12.0 ± 2.0	7.2 ± 2.3	7.53 ± 1.55	90	1.22 ± 0.06	67.3 ± 2.6	7.9 ± 0.2
				150	1.02 ± 0.03	55.3 ± 1.6	5.6 ± 0.6
4	11.5 ± 1.8	5.9 ± 1.3	3.20 ± 0.42	90	0.85 ± 0.10	50.3 ± 2.8	6.0 ± 0.3
				150	0.53 ± 0.06	45.9 ± 1.8	4.8 ± 0.2
5	14.2 ± 1.4	6.4 ± 1.2	7.29 ± 043	90	1.37 ± 0.10	72.4 ± 2.7	9.5 ± 0.4
				150	1.17 ± 0.09	61.7 ± 2.0	7.5 ± 1.1

REFERENCES

Jackson, M. 2012. Distribution of Eucalanidae (Copepoda) within the Costa Rica Dome Area of the Eastern Tropical Pacific Ocean, University of Miami, Miami, Florida.

Landry, M.R., M.D. Ohman, R. Goericke, M.R. Stukel and K. Tsyrklevich. 2009. Lagrangian studies of phytoplankton growth and grazing relationships in a coastal upwelling ecosystem off Southern California. Prog. Oceanogr. 83, 208-216.

Sherr, E.B. and B.F. Sherr. 2002. Significance of predation by protists in aquatic microbial food webs. J. Gen. Mol. Microbiol. 81, 293-308.

Stukel, M.R., M. Décima, K.E. Selph, D.A.A. Taniguchi and M.R. Landry. In review. The role of *Synechococcus* in vertical flux in the Costa Rica upwelling dome. Prog. Oceanogr.

Taylor, A.G., R. Goericke, M.R. Landry, K.E. Selph, D.A. Wick and M.J. Roadman. 2012. Sharp gradients in phytoplankton community structure across a frontal zone in the California Current Ecosystem. J. Plankton Res. 34: 778-789.

Appendix 1. Cruise Event Log

Event #	Local Date	Local Time	Lat °N	Long °W	Event description	UTC Date	UTC Time
1	23-Jun	4:13 PM	8.988	87.007	CTD DEPLOYED	23-Jun	22:13
2	23-Jun	4:13 PM	8.988	87.007	CTD AT DEPTH	23-Jun	22:13
3	23-Jun	4:14 PM	8.988	87.007	CTD RECOVERED	23-Jun	22:14
4	23-Jun	4:14 PM	8.988	87.007	GOFLO DEPLOYED	23-Jun	22:14
5	23-Jun	4:15 PM	8.988	87.007	GOFLO RECOVERED	23-Jun	22:15
6	23-Jun	4:15 PM	8.988	87.007	TRACE METAL DEPLOYED	23-Jun	22:15
7	23-Jun	4:16 PM	8.988	87.007	TRACE METAL RECOVERED	23-Jun	22:16
8	23-Jun	4:16 PM	8.988	87.007	ZOOPLANKTON NET DEPLOYED	23-Jun	22:16
9	23-Jun	4:17 PM	8.987	87.007	ZOOPLANKTON NET RECOVERED	23-Jun	22:17
10	23-Jun	4:27 PM	8.985	87.009	ZOOPLANKTON NET DEPLOYED	23-Jun	22:27
11	23-Jun	4:31 PM	8.984	87.009	ZOOPLANKTON NET RECOVERED	23-Jun	22:31
12	23-Jun	4:49 PM	8.981	87.011	CTD DEPLOYED	23-Jun	22:49
13	23-Jun	5:30 PM	8.978	87.011	CTD AT DEPTH	23-Jun	23:30
14	23-Jun	10:36 PM	9.486	87.012	ZOOPLANKTON NET DEPLOYED	24-Jun	4:36
15	23-Jun	10:36 PM	9.486	87.012	ZOOPLANKTON NET RECOVERED	24-Jun	4:36
16	24-Jun	12:21 AM	9.715	87.004	SEDTRAP DEPLOYED	24-Jun	6:21
17	24-Jun	2:08 AM	9.721	86.998	CTD DEPLOYED	24-Jun	8:08
18	24-Jun	2:24 AM	9.721	86.998	CTD AT DEPTH	24-Jun	8:24
19	24-Jun	2:52 AM	9.721	86.998	CTD RECOVERED	24-Jun	8:52
20	24-Jun	4:48 AM	9.713	86.997	DRIFTER DEPLOYED	24-Jun	10:48
21	24-Jun	5:27 AM	9.711	86.994	TRACE METAL DEPLOYED	24-Jun	11:27
22	24-Jun	5:33 AM	9.711	86.994	TRACE METAL AT DEPTH	24-Jun	11:33
23	24-Jun	5:54 AM	9.713	86.992	TRACE METAL RECOVERED	24-Jun	11:54
24	24-Jun	7:36 AM	9.715	86.979	TRACE METAL DEPLOYED	24-Jun	13:36
25	24-Jun	7:39 AM	9.715	86.978	TRACE METAL AT DEPTH	24-Jun	13:39
26	24-Jun	7:58 AM	9.714	86.975	TRACE METAL RECOVERED	24-Jun	13:58
26	24-Jun	9:24 AM	9.713	86.958	TRACE METAL DEPLOYED	24-Jun	15:24
27	24-Jun	9:28 AM	9.713	86.958	TRACE METAL AT DEPTH	24-Jun	15:28
28	24-Jun	9:36 AM	9.713	86.957	TRACE METAL RECOVERED	24-Jun	15:35
29	24-Jun	9:46 AM	9.714	86.957	CTD DEPLOYED	24-Jun	15:46
30	24-Jun	10:11 AM	9.714	86.953	CTD AT DEPTH	24-Jun	16:11
31	24-Jun	11:27 AM	9.717	86.944	CTD RECOVERED	24-Jun	17:27
32	24-Jun	11:58 AM	9.715	86.941	TRACE METAL DEPLOYED	24-Jun	17:58
33	24-Jun	12:45 PM	9.715	86.941	TRACE METAL AT DEPTH	24-Jun	18:45
34	24-Jun	12:45 PM	9.715	86.941	TRACE METAL RECOVERED	24-Jun	18:45
35	24-Jun	1:23 PM	9.713	86.942	ZOOPLANKTON NET DEPLOYED	24-Jun	19:22
36	24-Jun	1:45 PM	9.707	86.944	ZOOPLANKTON NET RECOVERED	24-Jun	19:45
37	24-Jun	1:46 PM	9.706	86.944	ZOOPLANKTON NET DEPLOYED	24-Jun	19:45
38	24-Jun	2:08 PM	9.701	86.944	ZOOPLANKTON NET RECOVERED	24-Jun	20:08
39	24-Jun	4:19 PM	9.702	86.914	CTD DEPLOYED	24-Jun	22:19
40	24-Jun	4:53 PM	9.698	86.909	CTD RECOVERED	24-Jun	22:53
41	24-Jun	5:04 PM	9.697	86.907	TRACE METAL DEPLOYED	24-Jun	23:04
42	24-Jun	5:28 PM	9.696	86.905	TRACE METAL AT DEPTH	24-Jun	23:28
43	24-Jun	5:52 PM	9.696	86.905	TRACE METAL RECOVERED	24-Jun	23:51
44	24-Jun	6:12 PM	9.693	86.901	THORIUM PUMP DEPLOYED	25-Jun	0:12
45	24-Jun	6:21 PM	9.692	86.900	THORIUM PUMP AT DEPTH	25-Jun	0:20
46	24-Jun	7:35 PM	9.683	86.891	THORIUM PUMP RECOVERED	25-Jun	1:35
47	24-Jun	8:38 PM	9.678	86.887	ZOOPLANKTON NET DEPLOYED	25-Jun	2:37
48	24-Jun	8:48 PM	9.677	86.888	ZOOPLANKTON NET RECOVERED	25-Jun	2:48
49	24-Jun	8:51 PM	9.677	86.888	ZOOPLANKTON NET DEPLOYED	25-Jun	2:50

50	24-Jun	9:05 PM	9.676	86.889	ZOOPLANKTON NET RECOVERED	25-Jun	3:05
51	24-Jun	9:12 PM	9.675	86.890	ZOOPLANKTON NET DEPLOYED	25-Jun	3:12
52	24-Jun	9:36 PM	9.673	86.893	ZOOPLANKTON NET RECOVERED	25-Jun	3:36
53	24-Jun	9:41 PM	9.673	86.894	ZOOPLANKTON NET DEPLOYED	25-Jun	3:41
54	24-Jun	10:04 PM	9.671	86.899	ZOOPLANKTON NET RECOVERED	25-Jun	4:04
55	25-Jun	12:11 AM	9.663	86.879	ZOOPLANKTON NET DEPLOYED	25-Jun	6:11
56	25-Jun	12:32 AM	9.659	86.882	ZOOPLANKTON NET RECOVERED	25-Jun	6:32
57	25-Jun	2:10 AM	9.656	86.870	CTD DEPLOYED	25-Jun	8:10
58	25-Jun	2:32 AM	9.656	86.870	CTD AT DEPTH	25-Jun	8:32
59	25-Jun	2:51 AM	9.656	86.870	CTD RECOVERED	25-Jun	8:51
60	25-Jun	4:34 AM	9.644	86.866	DRIFTER RECOVERED	25-Jun	10:34
61	25-Jun	4:48 AM	9.643	86.866	DRIFTER DEPLOYED	25-Jun	10:48
62	25-Jun	5:04 AM	9.640	86.867	CTD DEPLOYED	25-Jun	11:03
63	25-Jun	5:27 AM	9.638	86.866	CTD AT DEPTH	25-Jun	11:27
64	25-Jun	6:21 AM	9.632	86.866	CTD RECOVERED	25-Jun	12:21
65	25-Jun	6:35 AM	9.630	86.866	TRACE METAL DEPLOYED	25-Jun	12:35
66	25-Jun	6:44 AM	9.630	86.867	TRACE METAL AT DEPTH	25-Jun	12:44
67	25-Jun	7:03 AM	9.630	86.868	TRACE METAL RECOVERED	25-Jun	13:02
68	25-Jun	8:46 AM	9.626	86.865	TRACE METAL DEPLOYED	25-Jun	14:46
69	25-Jun	9:07 AM	9.623	86.865	TRACE METAL AT DEPTH	25-Jun	15:07
70	25-Jun	9:31 AM	9.622	86.865	TRACE METAL RECOVERED	25-Jun	15:31
71	25-Jun	10:21 AM	9.620	86.864	TRACE METAL DEPLOYED	25-Jun	16:21
72	25-Jun	10:44 AM	9.618	86.863	TRACE METAL AT DEPTH	25-Jun	16:44
73	25-Jun	11:02 AM	9.618	86.861	TRACE METAL RECOVERED	25-Jun	17:02
74	25-Jun	11:18 AM	9.618	86.862	ZOOPLANKTON NET DEPLOYED	25-Jun	17:18
75	25-Jun	11:31 AM	9.617	86.866	ZOOPLANKTON NET RECOVERED	25-Jun	17:31
76	25-Jun	11:38 AM	9.618	86.867	ZOOPLANKTON NET DEPLOYED	25-Jun	17:38
77	25-Jun	11:55 AM	9.620	86.871	ZOOPLANKTON NET RECOVERED	25-Jun	17:54
78	25-Jun	1:00 PM	9.623	86.875	MOCNESS DEPLOYED	25-Jun	19:00
79	25-Jun	1:50 PM	9.626	86.900	MOCNESS RECOVERED	25-Jun	19:50
80	25-Jun	3:58 PM	9.606	86.855	MOCNESS DEPLOYED	25-Jun	21:58
81	25-Jun	5:17 PM	9.574	86.890	MOCNESS RECOVERED	25-Jun	23:17
82	25-Jun	6:56 PM	9.606	86.852	CTD DEPLOYED	26-Jun	0:56
83	25-Jun	7:09 PM	9.606	86.852	CTD AT DEPTH	26-Jun	1:09
84	25-Jun	7:25 PM	9.606	86.852	CTD RECOVERED	26-Jun	1:25
85	25-Jun	9:06 PM	9.606	86.851	ZOOPLANKTON NET DEPLOYED	26-Jun	3:06
86	25-Jun	9:21 PM	9.604	86.854	ZOOPLANKTON NET RECOVERED	26-Jun	3:21
87	25-Jun	9:50 PM	9.600	86.856	MOCNESS DEPLOYED	26-Jun	3:50
88	25-Jun	10:18 PM	9.596	86.871	MOCNESS RECOVERED	26-Jun	4:18
89	25-Jun	10:27 PM	9.594	86.875	MOCNESS DEPLOYED	26-Jun	4:27
90	26-Jun	12:41 AM	9.580	86.938	MOCNESS RECOVERED	26-Jun	6:41
91	26-Jun	2:06 AM	9.597	86.829	CTD DEPLOYED	26-Jun	8:06
92	26-Jun	2:22 AM	9.597	86.829	CTD AT DEPTH	26-Jun	8:21
93	26-Jun	2:52 AM	9.596	86.829	CTD RECOVERED	26-Jun	8:52
94	26-Jun	4:37 AM	9.597	86.826	DRIFTER RECOVERED	26-Jun	10:37
95	26-Jun	4:47 AM	9.596	86.826	DRIFTER DEPLOYED	26-Jun	10:47
96	26-Jun	7:00 AM	9.596	86.828	TRACE METAL DEPLOYED	26-Jun	13:00
97	26-Jun	7:08 AM	9.597	86.827	TRACE METAL AT DEPTH	26-Jun	13:07
98	26-Jun	7:26 AM	9.596	86.827	TRACE METAL RECOVERED	26-Jun	13:26
99	26-Jun	10:45 AM	9.603	86.813	TRACE METAL DEPLOYED	26-Jun	16:45
100	26-Jun	11:04 AM	9.603	86.810	TRACE METAL RECOVERED	26-Jun	17:04
101	26-Jun	12:04 PM	9.601	86.806	ZOOPLANKTON NET DEPLOYED	26-Jun	18:03
102	26-Jun	12:18 PM	9.599	86.807	ZOOPLANKTON NET RECOVERED	26-Jun	18:18
103	26-Jun	1:01 PM	9.597	86.806	PHYTO NET DEPLOYED	26-Jun	19:01

104	26-Jun	1:22 PM	9.595	86.807	PHYTO NET RECOVERED	26-Jun	19:22
105	26-Jun	2:06 PM	9.598	86.792	ZOOPLANKTON NET DEPLOYED	26-Jun	20:06
106	26-Jun	2:18 PM	9.596	86.794	ZOOPLANKTON NET RECOVERED	26-Jun	20:17
107	26-Jun	4:00 PM	9.599	86.777	THORIUM PUMP DEPLOYED	26-Jun	22:00
108	26-Jun	4:09 PM	9.598	86.775	THORIUM PUMP AT DEPTH	26-Jun	22:09
109	26-Jun	5:20 PM	9.596	86.773	THORIUM PUMP RECOVERED	26-Jun	23:20
110	26-Jun	6:59 PM	9.598	86.764	CTD DEPLOYED	27-Jun	0:59
111	26-Jun	7:10 PM	9.598	86.763	CTD AT DEPTH	27-Jun	1:10
112	26-Jun	7:29 PM	9.598	86.759	CTD RECOVERED	27-Jun	1:29
113	26-Jun	7:42 PM	9.598	86.759	ZOOPLANKTON NET DEPLOYED	27-Jun	1:42
114	26-Jun	7:52 PM	9.597	86.760	ZOOPLANKTON NET RECOVERED	27-Jun	1:52
115	26-Jun	9:28 PM	9.595	86.752	ZOOPLANKTON NET DEPLOYED	27-Jun	3:28
116	26-Jun	9:40 PM	9.594	86.752	ZOOPLANKTON NET RECOVERED	27-Jun	3:40
117	26-Jun	9:44 PM	9.594	86.752	ZOOPLANKTON NET DEPLOYED	27-Jun	3:44
118	26-Jun	10:06 PM	9.592	86.751	ZOOPLANKTON NET RECOVERED	27-Jun	4:06
119	26-Jun	10:11 PM	9.592	86.750	ZOOPLANKTON NET DEPLOYED	27-Jun	4:11
120	26-Jun	10:26 PM	9.591	86.751	ZOOPLANKTON NET RECOVERED	27-Jun	4:26
121	26-Jun	10:32 PM	9.590	86.752	ZOOPLANKTON NET DEPLOYED	27-Jun	4:32
122	26-Jun	10:48 PM	9.589	86.753	ZOOPLANKTON NET RECOVERED	27-Jun	4:48
123	26-Jun	11:35 PM	9.580	86.735	ZOOPLANKTON NET DEPLOYED	27-Jun	5:35
124	26-Jun	11:55 PM	9.578	86.737	ZOOPLANKTON NET RECOVERED	27-Jun	5:55
125	27-Jun	12:21 AM	9.576	86.733	PHYTO NET DEPLOYED	27-Jun	6:21
126	27-Jun	1:00 AM	9.574	86.734	PHYTO NET RECOVERED	27-Jun	6:59
127	27-Jun	1:32 AM	9.564	86.720	CTD DEPLOYED	27-Jun	7:32
128	27-Jun	2:08 AM	9.564	86.720	CTD AT DEPTH	27-Jun	8:07
129	27-Jun	2:21 AM	9.564	86.720	CTD RECOVERED	27-Jun	8:21
130	27-Jun	3:47 AM	9.553	86.717	DRIFTER RECOVERED	27-Jun	9:47
131	27-Jun	5:18 AM	9.611	86.768	SEDTRAP RECOVERED	27-Jun	11:18
132	29-Jun	5:26 PM	6.629	88.500	MISC-ADD REMARKS	29-Jun	23:26
133	29-Jun	5:48 PM	6.628	88.497	MISC-ADD REMARKS	29-Jun	23:47
134	29-Jun	5:53 PM	6.628	88.497	ZOOPLANKTON NET DEPLOYED	29-Jun	23:53
135	29-Jun	6:07 PM	6.624	88.498	ZOOPLANKTON NET RECOVERED	30-Jun	0:07
136	29-Jun	6:18 PM	6.623	88.497	CTD DEPLOYED	30-Jun	0:18
137	29-Jun	6:37 PM	6.620	88.495	CTD AT DEPTH	30-Jun	0:37
138	29-Jun	7:04 PM	6.616	88.492	CTD RECOVERED	30-Jun	1:04
139	29-Jun	7:11 PM	6.615	88.491	TRACE METAL DEPLOYED	30-Jun	1:11
140	29-Jun	7:23 PM	6.615	88.491	TRACE METAL AT DEPTH	30-Jun	1:22
141	29-Jun	7:29 PM	6.614	88.491	TRACE METAL RECOVERED	30-Jun	1:28
142	30-Jun	12:01 AM	6.999	89.000	FRRF DEPLOYED	30-Jun	6:00
143	30-Jun	12:23 AM	6.999	89.000	FRRF AT DEPTH	30-Jun	6:23
144	30-Jun	12:23 AM	6.999	89.000	FRRF RECOVERED	30-Jun	6:23
145	30-Jun	12:41 AM	6.998	89.002	ZOOPLANKTON NET DEPLOYED	30-Jun	6:41
146	30-Jun	12:55 AM	7.000	88.999	ZOOPLANKTON NET RECOVERED	30-Jun	6:54
147	30-Jun	1:02 AM	7.000	88.998	CTD DEPLOYED	30-Jun	7:01
148	30-Jun	1:20 AM	6.998	88.997	CTD AT DEPTH	30-Jun	7:20
149	30-Jun	1:40 AM	6.996	88.996	CTD RECOVERED	30-Jun	7:40
150	30-Jun	1:50 AM	6.995	88.996	TRACE METAL DEPLOYED	30-Jun	7:50
151	30-Jun	2:01 AM	6.994	88.996	TRACE METAL AT DEPTH	30-Jun	8:01
152	30-Jun	2:05 AM	6.994	88.996	TRACE METAL RECOVERED	30-Jun	8:05
153	30-Jun	6:44 AM	7.501	89.500	FRRF DEPLOYED	30-Jun	12:43
154	30-Jun	7:01 AM	7.501	89.493	FRRF AT DEPTH	30-Jun	13:01
155	30-Jun	7:11 AM	7.501	89.489	FRRF RECOVERED	30-Jun	13:11
156	30-Jun	7:21 AM	7.501	89.487	ZOOPLANKTON NET DEPLOYED	30-Jun	13:21
157	30-Jun	7:34 AM	7.496	89.486	ZOOPLANKTON NET RECOVERED	30-Jun	13:33

158	30-Jun	7:40 AM	7.496	89.485	CTD DEPLOYED	30-Jun	13:40
159	30-Jun	7:45 AM	7.496	89.483	CTD AT DEPTH	30-Jun	13:45
160	30-Jun	8:35 AM	7.497	89.471	CTD RECOVERED	30-Jun	14:34
161	30-Jun	8:43 AM	7.497	89.469	TRACE METAL DEPLOYED	30-Jun	14:43
162	30-Jun	8:46 AM	7.497	89.468	TRACE METAL AT DEPTH	30-Jun	14:45
163	30-Jun	8:57 AM	7.497	89.466	TRACE METAL RECOVERED	30-Jun	14:57
164	30-Jun	9:06 AM	7.502	89.471	STATION DEPARTURE	30-Jun	15:05
165	30-Jun	1:54 PM	8.002	89.999	FRRF DEPLOYED	30-Jun	19:53
166	30-Jun	1:54 PM	8.002	89.999	FRRF AT DEPTH	30-Jun	19:53
167	30-Jun	2:08 PM	8.002	89.997	FRRF AT DEPTH	30-Jun	20:08
168	30-Jun	2:17 PM	8.001	89.996	FRRF RECOVERED	30-Jun	20:17
169	30-Jun	2:24 PM	8.000	89.995	ZOOPLANKTON NET DEPLOYED	30-Jun	20:24
170	30-Jun	2:41 PM	7.995	89.991	ZOOPLANKTON NET RECOVERED	30-Jun	20:41
171	30-Jun	2:45 PM	7.995	89.991	CTD DEPLOYED	30-Jun	20:45
172	30-Jun	3:03 PM	7.994	89.989	CTD AT DEPTH	30-Jun	21:03
173	30-Jun	3:31 PM	7.994	89.984	CTD RECOVERED	30-Jun	21:31
174	30-Jun	3:38 PM	7.994	89.983	TRACE METAL DEPLOYED	30-Jun	21:38
175	30-Jun	3:47 PM	7.993	89.982	TRACE METAL AT DEPTH	30-Jun	21:47
176	30-Jun	3:50 PM	7.993	89.981	TRACE METAL RECOVERED	30-Jun	21:50
177	30-Jun	8:17 PM	8.501	90.500	STATION ARRIVAL	1-Jul	2:17
178	30-Jun	8:18 PM	8.501	90.500	FRRF DEPLOYED	1-Jul	2:18
179	30-Jun	8:21 PM	8.502	90.500	FRRF AT DEPTH	1-Jul	2:21
180	30-Jun	8:53 PM	8.501	90.497	FRRF RECOVERED	1-Jul	2:52
181	30-Jun	9:00 PM	8.501	90.497	ZOOPLANKTON NET DEPLOYED	1-Jul	2:59
182	30-Jun	9:16 PM	8.496	90.497	ZOOPLANKTON NET RECOVERED	1-Jul	3:16
183	30-Jun	9:29 PM	8.495	90.497	CTD DEPLOYED	1-Jul	3:29
184	30-Jun	9:44 PM	8.495	90.496	CTD AT DEPTH	1-Jul	3:44
185	30-Jun	10:15 PM	8.495	90.495	CTD RECOVERED	1-Jul	4:14
186	30-Jun	10:25 PM	8.494	90.494	TRACE METAL DEPLOYED	1-Jul	4:25
187	30-Jun	10:32 PM	8.494	90.493	TRACE METAL AT DEPTH	1-Jul	4:32
188	30-Jun	10:52 PM	8.505	90.505	TRACE METAL RECOVERED	1-Jul	4:52
189	30-Jun	10:52 PM	8.505	90.505	STATION DEPARTURE	1-Jul	4:52
190	1-Jul	3:13 AM	9.000	90.999	FRRF DEPLOYED	1-Jul	9:13
191	1-Jul	3:29 AM	8.999	90.999	FRRF AT DEPTH	1-Jul	9:28
192	1-Jul	3:40 AM	8.998	90.998	FRRF RECOVERED	1-Jul	9:40
193	1-Jul	3:48 AM	8.996	90.997	ZOOPLANKTON NET DEPLOYED	1-Jul	9:48
194	1-Jul	4:02 AM	8.991	90.994	ZOOPLANKTON NET RECOVERED	1-Jul	10:02
195	1-Jul	4:13 AM	8.991	90.991	CTD DEPLOYED	1-Jul	10:13
196	1-Jul	4:31 AM	8.991	90.988	CTD AT DEPTH	1-Jul	10:31
197	1-Jul	4:59 AM	8.991	90.984	CTD RECOVERED	1-Jul	10:59
198	1-Jul	5:08 AM	8.991	90.983	TRACE METAL DEPLOYED	1-Jul	11:08
199	1-Jul	5:12 AM	8.991	90.982	TRACE METAL AT DEPTH	1-Jul	11:12
200	1-Jul	5:20 AM	8.991	90.981	TRACE METAL RECOVERED	1-Jul	11:19
201	1-Jul	9:57 AM	9.499	91.500	STATION ARRIVAL	1-Jul	15:57
202	1-Jul	10:07 AM	9.497	91.499	ZOOPLANKTON NET DEPLOYED	1-Jul	16:07
203	1-Jul	10:23 AM	9.490	91.501	ZOOPLANKTON NET RECOVERED	1-Jul	16:23
204	1-Jul	10:31 AM	9.489	91.500	FRRF DEPLOYED	1-Jul	16:30
205	1-Jul	10:46 AM	9.486	91.498	FRRF AT DEPTH	1-Jul	16:46
206	1-Jul	10:56 AM	9.484	91.499	FRRF RECOVERED	1-Jul	16:56
207	1-Jul	11:04 AM	9.483	91.499	CTD DEPLOYED	1-Jul	17:03
208	1-Jul	11:19 AM	9.482	91.500	CTD AT DEPTH	1-Jul	17:18
209	1-Jul	11:53 AM	9.477	91.502	CTD RECOVERED	1-Jul	17:52
210	1-Jul	12:06 PM	9.476	91.502	TRACE METAL DEPLOYED	1-Jul	18:05
211	1-Jul	12:06 PM	9.476	91.502	TRACE METAL AT DEPTH	1-Jul	18:06

212	1-Jul	12:12 PM	9.476	91.503	TRACE METAL RECOVERED	1-Jul	18:12
213	1-Jul	5:52 PM	10.000	92.000	FRRF DEPLOYED	1-Jul	23:52
214	1-Jul	6:19 PM	9.999	92.000	FRRF RECOVERED	2-Jul	0:19
215	1-Jul	6:26 PM	9.998	92.000	ZOOPLANKTON NET DEPLOYED	2-Jul	0:26
216	1-Jul	6:41 PM	9.997	92.006	ZOOPLANKTON NET RECOVERED	2-Jul	0:41
217	1-Jul	6:53 PM	9.996	92.007	CTD DEPLOYED	2-Jul	0:53
218	1-Jul	7:13 PM	9.994	92.007	CTD AT DEPTH	2-Jul	1:13
219	1-Jul	7:35 PM	9.992	92.008	CTD RECOVERED	2-Jul	1:34
220	1-Jul	7:46 PM	9.991	92.008	TRACE METAL DEPLOYED	2-Jul	1:45
221	1-Jul	7:47 PM	9.991	92.008	TRACE METAL AT DEPTH	2-Jul	1:47
222	1-Jul	7:59 PM	9.991	92.008	TRACE METAL RECOVERED	2-Jul	1:58
223	1-Jul	7:59 PM	9.991	92.008	STATION DEPARTURE	2-Jul	1:58
224	2-Jul	5:11 AM	9.501	90.499	STATION ARRIVAL	2-Jul	11:11
225	2-Jul	5:11 AM	9.501	90.499	FRRF DEPLOYED	2-Jul	11:11
226	2-Jul	5:27 AM	9.500	90.499	FRRF AT DEPTH	2-Jul	11:26
227	2-Jul	5:38 AM	9.499	90.498	FRRF RECOVERED	2-Jul	11:37
228	2-Jul	5:45 AM	9.498	90.501	ZOOPLANKTON NET DEPLOYED	2-Jul	11:44
229	2-Jul	6:01 AM	9.496	90.507	ZOOPLANKTON NET RECOVERED	2-Jul	12:01
230	2-Jul	6:10 AM	9.495	90.511	ZOOPLANKTON NET DEPLOYED	2-Jul	12:10
231	2-Jul	6:25 AM	9.494	90.517	ZOOPLANKTON NET RECOVERED	2-Jul	12:25
232	2-Jul	6:37 AM	9.493	90.517	CTD DEPLOYED	2-Jul	12:37
233	2-Jul	6:54 AM	9.492	90.517	CTD AT DEPTH	2-Jul	12:54
234	2-Jul	7:14 AM	9.490	90.517	CTD RECOVERED	2-Jul	13:14
235	2-Jul	7:21 AM	9.490	90.517	TRACE METAL DEPLOYED	2-Jul	13:21
236	2-Jul	7:25 AM	9.490	90.517	TRACE METAL AT DEPTH	2-Jul	13:25
237	2-Jul	7:31 AM	9.489	90.516	TRACE METAL RECOVERED	2-Jul	13:31
238	2-Jul	7:54 AM	9.453	90.515	STATION DEPARTURE	2-Jul	13:54
239	2-Jul	10:56 AM	8.999	90.501	STATION ARRIVAL	2-Jul	16:56
240	2-Jul	11:00 AM	9.000	90.500	FRRF DEPLOYED	2-Jul	17:00
241	2-Jul	11:14 AM	8.997	90.500	FRRF AT DEPTH	2-Jul	17:13
242	2-Jul	11:24 AM	8.996	90.500	FRRF RECOVERED	2-Jul	17:24
243	2-Jul	11:32 AM	8.995	90.500	ZOOPLANKTON NET DEPLOYED	2-Jul	17:31
244	2-Jul	11:53 AM	8.988	90.505	ZOOPLANKTON NET RECOVERED	2-Jul	17:53
245	2-Jul	12:25 PM	8.987	90.505	ZOOPLANKTON NET DEPLOYED	2-Jul	18:25
246	2-Jul	12:42 PM	8.992	90.508	ZOOPLANKTON NET RECOVERED	2-Jul	18:42
247	2-Jul	12:52 PM	8.995	90.510	ZOOPLANKTON NET DEPLOYED	2-Jul	18:52
248	2-Jul	1:06 PM	8.999	90.513	ZOOPLANKTON NET RECOVERED	2-Jul	19:06
249	2-Jul	1:12 PM	9.000	90.513	CTD DEPLOYED	2-Jul	19:11
250	2-Jul	1:29 PM	9.001	90.514	CTD AT DEPTH	2-Jul	19:29
251	2-Jul	1:56 PM	9.003	90.514	CTD RECOVERED	2-Jul	19:56
252	2-Jul	2:00 PM	9.003	90.515	TRACE METAL DEPLOYED	2-Jul	20:00
253	2-Jul	2:04 PM	9.003	90.515	TRACE METAL AT DEPTH	2-Jul	20:04
254	2-Jul	2:11 PM	9.003	90.515	TRACE METAL RECOVERED	2-Jul	20:11
255	2-Jul	2:14 PM	9.004	90.516	FRRF DEPLOYED	2-Jul	20:14
256	2-Jul	2:30 PM	9.004	90.518	FRRF AT DEPTH	2-Jul	20:30
257	2-Jul	2:41 PM	9.005	90.518	FRRF RECOVERED	2-Jul	20:41
258	2-Jul	5:44 PM	8.499	90.500	FRRF DEPLOYED	2-Jul	23:44
259	2-Jul	5:58 PM	8.498	90.500	FRRF AT DEPTH	2-Jul	23:58
260	2-Jul	6:08 PM	8.497	90.501	FRRF RECOVERED	3-Jul	0:08
261	2-Jul	6:18 PM	8.497	90.502	ZOOPLANKTON NET DEPLOYED	3-Jul	0:18
262	2-Jul	6:30 PM	8.499	90.504	ZOOPLANKTON NET RECOVERED	3-Jul	0:30
263	2-Jul	6:37 PM	8.500	90.504	CTD DEPLOYED	3-Jul	0:37
264	2-Jul	6:53 PM	8.498	90.505	CTD AT DEPTH	3-Jul	0:53
265	2-Jul	7:19 PM	8.497	90.505	CTD RECOVERED	3-Jul	1:18

266	2-Jul	7:25 PM	8.496	90.505	TRACE METAL DEPLOYED	3-Jul	1:25
267	2-Jul	7:33 PM	8.496	90.505	TRACE METAL AT DEPTH	3-Jul	1:33
268	2-Jul	7:36 PM	8.496	90.505	TRACE METAL RECOVERED	3-Jul	1:36
269	2-Jul	7:51 PM	8.503	90.497	STATION DEPARTURE	3-Jul	1:51
270	3-Jul	12:11 AM	9.001	90.000	STATION ARRIVAL	3-Jul	6:11
271	3-Jul	12:11 AM	9.001	90.000	FRRF DEPLOYED	3-Jul	6:11
272	3-Jul	12:23 AM	9.002	90.000	FRRF AT DEPTH	3-Jul	6:22
273	3-Jul	12:34 AM	9.003	90.000	FRRF RECOVERED	3-Jul	6:34
274	3-Jul	12:47 AM	9.006	89.996	ZOOPLANKTON NET DEPLOYED	3-Jul	6:47
275	3-Jul	1:01 AM	9.008	89.993	ZOOPLANKTON NET RECOVERED	3-Jul	7:00
276	3-Jul	1:10 AM	9.009	89.993	CTD DEPLOYED	3-Jul	7:10
277	3-Jul	1:27 AM	9.010	89.993	CTD AT DEPTH	3-Jul	7:27
278	3-Jul	1:46 AM	9.011	89.992	CTD RECOVERED	3-Jul	7:46
279	3-Jul	1:51 AM	9.012	89.992	TRACE METAL DEPLOYED	3-Jul	7:50
280	3-Jul	1:58 AM	9.012	89.992	TRACE METAL AT DEPTH	3-Jul	7:58
281	3-Jul	2:06 AM	9.014	89.990	TRACE METAL RECOVERED	3-Jul	8:06
282	3-Jul	2:53 AM	9.000	90.127	DISPOSABLE DRIFTER DEPLOYED	3-Jul	8:52
283	3-Jul	7:13 AM	9.000	90.904	DISPOSABLE DRIFTER DEPLOYED	3-Jul	13:13
284	3-Jul	7:57 AM	9.000	91.000	STATION ARRIVAL	3-Jul	13:57
285	3-Jul	8:02 AM	9.000	91.000	FRRF DEPLOYED	3-Jul	14:02
286	3-Jul	8:16 AM	8.999	90.999	FRRF AT DEPTH	3-Jul	14:16
287	3-Jul	8:28 AM	8.999	90.997	FRRF RECOVERED	3-Jul	14:28
288	3-Jul	8:40 AM	8.997	90.999	ZOOPLANKTON NET DEPLOYED	3-Jul	14:40
289	3-Jul	8:51 AM	8.994	91.001	ZOOPLANKTON NET RECOVERED	3-Jul	14:51
290	3-Jul	9:05 AM	8.994	91.000	CTD DEPLOYED	3-Jul	15:05
291	3-Jul	9:26 AM	8.993	90.996	CTD AT DEPTH	3-Jul	15:26
292	3-Jul	9:59 AM	8.988	90.995	CTD RECOVERED	3-Jul	15:59
293	3-Jul	10:09 AM	8.986	90.996	TRACE METAL DEPLOYED	3-Jul	16:08
294	3-Jul	10:11 AM	8.986	90.996	TRACE METAL AT DEPTH	3-Jul	16:11
295	3-Jul	10:19 AM	8.984	90.997	TRACE METAL RECOVERED	3-Jul	16:19
296	3-Jul	10:21 AM	8.984	90.997	STATION DEPARTURE	3-Jul	16:21
297	3-Jul	2:47 PM	9.038	90.551	DISPOSABLE DRIFTER DEPLOYED	3-Jul	20:47
298	3-Jul	2:54 PM	9.037	90.573	DISPOSABLE DRIFTER DEPLOYED	3-Jul	20:54
299	3-Jul	3:04 PM	9.051	90.564	DISPOSABLE DRIFTER DEPLOYED	3-Jul	21:04
300	3-Jul	3:08 PM	9.051	90.551	STATION ARRIVAL	3-Jul	21:08
301	3-Jul	10:30 PM	9.042	90.560	ZOOPLANKTON NET DEPLOYED	4-Jul	4:30
302	3-Jul	10:48 PM	9.044	90.564	ZOOPLANKTON NET RECOVERED	4-Jul	4:47
303	4-Jul	1:03 AM	9.037	90.564	SEDTRAP DEPLOYED	4-Jul	7:03
304	4-Jul	2:02 AM	9.035	90.562	CTD DEPLOYED	4-Jul	8:02
305	4-Jul	2:19 AM	9.035	90.562	CTD AT DEPTH	4-Jul	8:18
306	4-Jul	2:47 AM	9.034	90.562	CTD RECOVERED	4-Jul	8:46
307	4-Jul	4:31 AM	9.039	90.561	DRIFTER DEPLOYED	4-Jul	10:31
308	4-Jul	5:00 AM	9.038	90.559	FRRF DEPLOYED	4-Jul	11:00
309	4-Jul	5:16 AM	9.038	90.559	FRRF AT DEPTH	4-Jul	11:16
310	4-Jul	5:26 AM	9.039	90.558	FRRF RECOVERED	4-Jul	11:26
311	4-Jul	5:50 AM	9.040	90.556	CTD DEPLOYED	4-Jul	11:49
312	4-Jul	6:11 AM	9.039	90.555	CTD AT DEPTH	4-Jul	12:10
313	4-Jul	6:44 AM	9.040	90.553	CTD RECOVERED	4-Jul	12:44
314	4-Jul	7:07 AM	9.041	90.554	CTD DEPLOYED	4-Jul	13:07
315	4-Jul	7:30 AM	9.042	90.552	CTD AT DEPTH	4-Jul	13:30
316	4-Jul	8:30 AM	9.042	90.547	CTD RECOVERED	4-Jul	14:30
317	4-Jul	9:01 AM	9.042	90.546	FRRF DEPLOYED	4-Jul	15:00
318	4-Jul	9:16 AM	9.042	90.545	FRRF AT DEPTH	4-Jul	15:16
319	4-Jul	9:29 AM	9.043	90.545	FRRF RECOVERED	4-Jul	15:29

320	4-Jul	10:05 AM	9.046	90.544	TRACE METAL DEPLOYED	4-Jul	16:05
321	4-Jul	10:19 AM	9.046	90.543	TRACE METAL AT DEPTH	4-Jul	16:19
322	4-Jul	10:48 AM	9.043	90.544	TRACE METAL RECOVERED	4-Jul	16:47
323	4-Jul	11:01 AM	9.044	90.543	TRACE METAL DEPLOYED	4-Jul	17:00
324	4-Jul	11:17 AM	9.045	90.544	TRACE METAL AT DEPTH	4-Jul	17:16
325	4-Jul	11:42 AM	9.046	90.544	TRACE METAL RECOVERED	4-Jul	17:42
326	4-Jul	11:52 AM	9.045	90.545	ZOOPLANKTON NET DEPLOYED	4-Jul	17:52
327	4-Jul	12:10 PM	9.041	90.549	ZOOPLANKTON NET RECOVERED	4-Jul	18:10
328	4-Jul	12:12 PM	9.041	90.550	ZOOPLANKTON NET DEPLOYED	4-Jul	18:12
329	4-Jul	12:20 PM	9.039	90.551	ZOOPLANKTON NET RECOVERED	4-Jul	18:20
330	4-Jul	12:24 PM	9.038	90.551	FRRF DEPLOYED	4-Jul	18:24
331	4-Jul	12:40 PM	9.038	90.551	FRRF AT DEPTH	4-Jul	18:40
332	4-Jul	1:10 PM	9.049	90.541	CTD DEPLOYED	4-Jul	19:10
333	4-Jul	1:21 PM	9.049	90.541	CTD AT DEPTH	4-Jul	19:21
334	4-Jul	1:34 PM	9.049	90.541	CTD RECOVERED	4-Jul	19:33
335	4-Jul	1:45 PM	9.050	90.540	TRACE METAL DEPLOYED	4-Jul	19:45
336	4-Jul	2:01 PM	9.050	90.540	TRACE METAL AT DEPTH	4-Jul	20:01
337	4-Jul	2:21 PM	9.050	90.540	TRACE METAL RECOVERED	4-Jul	20:20
338	4-Jul	3:30 PM	9.054	90.528	TRACE METAL DEPLOYED	4-Jul	21:29
339	4-Jul	3:41 PM	9.054	90.528	TRACE METAL AT DEPTH	4-Jul	21:41
340	4-Jul	3:51 PM	9.054	90.528	TRACE METAL DEPLOYED	4-Jul	21:51
341	4-Jul	4:00 PM	9.054	90.528	TRACE METAL AT DEPTH	4-Jul	21:59
342	4-Jul	4:01 PM	9.054	90.528	TRACE METAL RECOVERED	4-Jul	22:01
343	4-Jul	6:05 PM	9.054	90.519	FRRF DEPLOYED	5-Jul	0:05
344	4-Jul	6:21 PM	9.054	90.519	FRRF AT DEPTH	5-Jul	0:21
345	4-Jul	6:31 PM	9.053	90.518	FRRF RECOVERED	5-Jul	0:31
346	4-Jul	7:00 PM	9.052	90.517	CTD DEPLOYED	5-Jul	0:59
347	4-Jul	7:09 PM	9.052	90.517	CTD AT DEPTH	5-Jul	1:09
348	4-Jul	7:30 PM	9.052	90.515	CTD RECOVERED	5-Jul	1:30
349	4-Jul	8:17 PM	9.051	90.511	THORIUM PUMP DEPLOYED	5-Jul	2:17
350	4-Jul	8:41 PM	9.051	90.509	THORIUM PUMP AT DEPTH	5-Jul	2:41
351	4-Jul	9:14 PM	9.049	90.509	THORIUM PUMP RECOVERED	5-Jul	3:13
352	4-Jul	9:21 PM	9.049	90.509	ZOOPLANKTON NET DEPLOYED	5-Jul	3:20
353	4-Jul	9:39 PM	9.050	90.512	ZOOPLANKTON NET RECOVERED	5-Jul	3:39
354	4-Jul	10:00 PM	9.051	90.510	ZOOPLANKTON NET DEPLOYED	5-Jul	4:00
355	4-Jul	10:19 PM	9.046	90.509	ZOOPLANKTON NET RECOVERED	5-Jul	4:18
356	4-Jul	11:32 PM	9.045	90.505	FRRF DEPLOYED	5-Jul	5:32
357	5-Jul	12:00 AM	9.044	90.506	FRRF AT DEPTH	5-Jul	6:00
358	5-Jul	12:00 AM	9.044	90.506	FRRF RECOVERED	5-Jul	6:00
359	5-Jul	12:13 AM	9.041	90.507	ZOOPLANKTON NET DEPLOYED	5-Jul	6:13
360	5-Jul	12:30 AM	9.035	90.507	ZOOPLANKTON NET RECOVERED	5-Jul	6:30
361	5-Jul	1:03 AM	9.040	90.504	PHYTO NET DEPLOYED	5-Jul	7:02
362	5-Jul	1:47 AM	9.040	90.504	PHYTO NET RECOVERED	5-Jul	7:47
363	5-Jul	1:57 AM	9.040	90.504	CTD DEPLOYED	5-Jul	7:57
364	5-Jul	2:15 AM	9.040	90.504	CTD AT DEPTH	5-Jul	8:15
365	5-Jul	2:36 AM	9.040	90.504	CTD RECOVERED	5-Jul	8:35
366	5-Jul	4:18 AM	9.042	90.501	DRIFTER RECOVERED	5-Jul	10:18
367	5-Jul	4:27 AM	9.041	90.501	DRIFTER DEPLOYED	5-Jul	10:27
368	5-Jul	5:10 AM	9.038	90.502	FRRF DEPLOYED	5-Jul	11:10
369	5-Jul	5:31 AM	9.038	90.501	FRRF AT DEPTH	5-Jul	11:30
370	5-Jul	5:40 AM	9.037	90.501	FRRF RECOVERED	5-Jul	11:40
371	5-Jul	6:05 AM	9.035	90.502	TRACE METAL DEPLOYED	5-Jul	12:05
372	5-Jul	6:08 AM	9.035	90.502	TRACE METAL AT DEPTH	5-Jul	12:07
373	5-Jul	6:15 AM	9.034	90.501	TRACE METAL RECOVERED	5-Jul	12:15

374	5-Jul	6:25 AM	9.033	90.501	TRACE METAL DEPLOYED	5-Jul	12:25
375	5-Jul	6:27 AM	9.033	90.500	TRACE METAL AT DEPTH	5-Jul	12:27
376	5-Jul	6:34 AM	9.032	90.500	TRACE METAL RECOVERED	5-Jul	12:34
377	5-Jul	8:12 AM	9.026	90.498	CTD DEPLOYED	5-Jul	14:12
378	5-Jul	8:34 AM	9.025	90.499	CTD AT DEPTH	5-Jul	14:34
379	5-Jul	9:34 AM	9.023	90.499	CTD RECOVERED	5-Jul	15:34
380	5-Jul	10:03 AM	9.021	90.500	TRACE METAL DEPLOYED	5-Jul	16:03
381	5-Jul	10:06 AM	9.021	90.500	TRACE METAL AT DEPTH	5-Jul	16:06
382	5-Jul	10:25 AM	9.021	90.500	TRACE METAL RECOVERED	5-Jul	16:25
383	5-Jul	10:26 AM	9.021	90.500	TRACE METAL DEPLOYED	5-Jul	16:26
384	5-Jul	10:27 AM	9.021	90.500	TRACE METAL AT DEPTH	5-Jul	16:27
385	5-Jul	10:36 AM	9.021	90.500	TRACE METAL RECOVERED	5-Jul	16:35
386	5-Jul	12:08 PM	9.014	90.500	FRRF DEPLOYED	5-Jul	18:08
387	5-Jul	12:25 PM	9.014	90.500	FRRF AT DEPTH	5-Jul	18:24
388	5-Jul	12:33 PM	9.014	90.500	FRRF RECOVERED	5-Jul	18:32
389	5-Jul	12:53 PM	9.009	90.504	ZOOPLANKTON NET DEPLOYED	5-Jul	18:53
390	5-Jul	12:54 PM	9.009	90.504	ZOOPLANKTON NET RECOVERED	5-Jul	18:54
391	5-Jul	1:00 PM	9.008	90.505	ZOOPLANKTON NET DEPLOYED	5-Jul	18:59
392	5-Jul	1:18 PM	9.006	90.510	ZOOPLANKTON NET RECOVERED	5-Jul	19:17
393	5-Jul	2:05 PM	9.007	90.504	TRACE METAL DEPLOYED	5-Jul	20:05
394	5-Jul	2:19 PM	9.007	90.504	TRACE METAL AT DEPTH	5-Jul	20:18
395	5-Jul	2:42 PM	9.007	90.504	TRACE METAL RECOVERED	5-Jul	20:42
396	5-Jul	2:52 PM	9.006	90.503	TRACE METAL DEPLOYED	5-Jul	20:51
397	5-Jul	3:21 PM	9.006	90.503	TRACE METAL AT DEPTH	5-Jul	21:21
398	5-Jul	3:50 PM	9.000	90.506	TRACE METAL RECOVERED	5-Jul	21:50
399	5-Jul	4:01 PM	8.999	90.507	THORIUM PUMP DEPLOYED	5-Jul	22:01
400	5-Jul	4:16 PM	8.998	90.507	THORIUM PUMP AT DEPTH	5-Jul	22:16
401	5-Jul	5:18 PM	8.992	90.508	THORIUM PUMP RECOVERED	5-Jul	23:18
402	5-Jul	5:31 PM	8.991	90.507	FRRF DEPLOYED	5-Jul	23:31
403	5-Jul	5:58 PM	8.989	90.506	FRRF RECOVERED	5-Jul	23:58
404	5-Jul	6:30 PM	8.987	90.506	CTD DEPLOYED	6-Jul	0:29
405	5-Jul	6:45 PM	8.986	90.505	CTD AT DEPTH	6-Jul	0:45
406	5-Jul	7:16 PM	8.982	90.503	CTD RECOVERED	6-Jul	1:16
407	5-Jul	9:13 PM	8.974	90.498	ZOOPLANKTON NET DEPLOYED	6-Jul	3:12
408	5-Jul	9:27 PM	8.970	90.498	ZOOPLANKTON NET RECOVERED	6-Jul	3:27
409	5-Jul	9:31 PM	8.970	90.498	ZOOPLANKTON NET DEPLOYED	6-Jul	3:30
410	5-Jul	9:46 PM	8.965	90.499	ZOOPLANKTON NET RECOVERED	6-Jul	3:46
411	5-Jul	10:33 PM	8.971	90.498	ZOOPLANKTON NET DEPLOYED	6-Jul	4:33
412	5-Jul	10:50 PM	8.966	90.500	ZOOPLANKTON NET RECOVERED	6-Jul	4:50
413	5-Jul	11:31 PM	8.967	90.490	FRRF DEPLOYED	6-Jul	5:31
414	5-Jul	11:50 PM	8.966	90.489	FRRF AT DEPTH	6-Jul	5:50
415	6-Jul	12:03 AM	8.966	90.488	FRRF RECOVERED	6-Jul	6:03
416	6-Jul	2:03 AM	8.954	90.491	CTD DEPLOYED	6-Jul	8:03
417	6-Jul	2:19 AM	8.954	90.491	CTD AT DEPTH	6-Jul	8:19
418	6-Jul	2:44 AM	8.953	90.492	CTD RECOVERED	6-Jul	8:43
419	6-Jul	4:24 AM	8.944	90.506	DRIFTER RECOVERED	6-Jul	10:24
420	6-Jul	4:34 AM	8.942	90.506	DRIFTER DEPLOYED	6-Jul	10:34
421	6-Jul	5:01 AM	8.938	90.506	FRRF DEPLOYED	6-Jul	11:01
422	6-Jul	5:18 AM	8.937	90.507	FRRF AT DEPTH	6-Jul	11:17
423	6-Jul	5:28 AM	8.936	90.507	FRRF RECOVERED	6-Jul	11:28
424	6-Jul	6:04 AM	8.933	90.511	CTD DEPLOYED	6-Jul	12:03
425	6-Jul	6:17 AM	8.932	90.511	CTD AT DEPTH	6-Jul	12:16
426	6-Jul	6:34 AM	8.930	90.512	CTD RECOVERED	6-Jul	12:34
427	6-Jul	8:09 AM	8.927	90.517	TRACE METAL DEPLOYED	6-Jul	14:09

428	6-Jul	8:22 AM	8.927	90.518	TRACE METAL RECOVERED	6-Jul	14:22
429	6-Jul	9:17 AM	8.927	90.521	MOCNESS DEPLOYED	6-Jul	15:16
430	6-Jul	12:06 PM	8.890	90.605	MOCNESS RECOVERED	6-Jul	18:06
431	6-Jul	1:44 PM	8.977	90.544	FRRF DEPLOYED	6-Jul	19:44
432	6-Jul	1:55 PM	8.977	90.544	FRRF AT DEPTH	6-Jul	19:55
433	6-Jul	2:13 PM	8.976	90.544	FRRF RECOVERED	6-Jul	20:13
434	6-Jul	2:13 PM	8.976	90.544	ZOOPLANKTON NET DEPLOYED	6-Jul	20:13
435	6-Jul	2:30 PM	8.971	90.543	ZOOPLANKTON NET RECOVERED	6-Jul	20:30
436	6-Jul	4:11 PM	8.976	90.548	THORIUM PUMP DEPLOYED	6-Jul	22:11
437	6-Jul	5:18 PM	8.975	90.551	THORIUM PUMP RECOVERED	6-Jul	23:18
438	6-Jul	5:27 PM	8.974	90.551	CTD DEPLOYED	6-Jul	23:26
439	6-Jul	5:49 PM	8.971	90.551	CTD AT DEPTH	6-Jul	23:49
440	6-Jul	6:10 PM	8.967	90.551	CTD RECOVERED	7-Jul	0:10
441	6-Jul	6:19 PM	8.965	90.551	FRRF DEPLOYED	7-Jul	0:19
442	6-Jul	6:25 PM	8.964	90.551	FRRF AT DEPTH	7-Jul	0:25
443	6-Jul	6:48 PM	8.961	90.551	FRRF RECOVERED	7-Jul	0:48
444	6-Jul	7:15 PM	8.947	90.547	CTD DEPLOYED	7-Jul	1:14
445	6-Jul	7:23 PM	8.947	90.547	CTD AT DEPTH	7-Jul	1:23
446	6-Jul	7:34 PM	8.945	90.546	CTD RECOVERED	7-Jul	1:34
447	6-Jul	8:10 PM	8.944	90.548	ZOOPLANKTON NET DEPLOYED	7-Jul	2:10
448	6-Jul	8:27 PM	8.941	90.550	ZOOPLANKTON NET RECOVERED	7-Jul	2:27
449	6-Jul	9:33 PM	8.941	90.549	ZOOPLANKTON NET DEPLOYED	7-Jul	3:33
450	6-Jul	9:49 PM	8.937	90.549	ZOOPLANKTON NET RECOVERED	7-Jul	3:49
451	6-Jul	10:11 PM	8.934	90.552	MOCNESS DEPLOYED	7-Jul	4:11
452	7-Jul	12:51 AM	8.860	90.599	MOCNESS RECOVERED	7-Jul	6:50
453	7-Jul	2:06 AM	8.947	90.545	CTD DEPLOYED	7-Jul	8:05
454	7-Jul	2:25 AM	8.947	90.545	CTD AT DEPTH	7-Jul	8:24
455	7-Jul	2:47 AM	8.947	90.545	CTD RECOVERED	7-Jul	8:47
456	7-Jul	4:28 AM	8.967	90.528	DRIFTER RECOVERED	7-Jul	10:28
457	7-Jul	4:37 AM	8.966	90.526	DRIFTER DEPLOYED	7-Jul	10:37
458	7-Jul	5:00 AM	8.967	90.521	FRRF DEPLOYED	7-Jul	10:59
459	7-Jul	5:16 AM	8.969	90.519	FRRF AT DEPTH	7-Jul	11:16
460	7-Jul	5:26 AM	8.969	90.518	FRRF RECOVERED	7-Jul	11:26
461	7-Jul	7:03 AM	8.978	90.515	CTD DEPLOYED	7-Jul	13:03
462	7-Jul	7:09 AM	8.978	90.515	CTD AT DEPTH	7-Jul	13:09
463	7-Jul	7:10 AM	8.978	90.515	CTD RECOVERED	7-Jul	13:09
464	7-Jul	7:32 AM	8.979	90.513	CTD DEPLOYED	7-Jul	13:32
465	7-Jul	8:35 AM	8.985	90.509	CTD AT DEPTH	7-Jul	14:35
466	7-Jul	10:17 AM	8.994	90.497	CTD RECOVERED	7-Jul	16:17
467	7-Jul	10:51 AM	8.995	90.492	ZOOPLANKTON NET DEPLOYED	7-Jul	16:51
468	7-Jul	11:05 AM	8.990	90.490	ZOOPLANKTON NET RECOVERED	7-Jul	17:05
469	7-Jul	11:15 AM	8.989	90.489	ZOOPLANKTON NET DEPLOYED	7-Jul	17:15
470	7-Jul	11:20 AM	8.988	90.489	ZOOPLANKTON NET RECOVERED	7-Jul	17:20
471	7-Jul	12:09 PM	8.999	90.481	FRRF DEPLOYED	7-Jul	18:08
472	7-Jul	12:09 PM	8.999	90.481	FRRF AT DEPTH	7-Jul	18:09
473	7-Jul	12:18 PM	8.999	90.481	FRRF RECOVERED	7-Jul	18:18
474	7-Jul	12:43 PM	8.999	90.482	TRACE METAL DEPLOYED	7-Jul	18:42
475	7-Jul	12:43 PM	8.999	90.482	TRACE METAL RECOVERED	7-Jul	18:42
476	7-Jul	1:20 PM	9.000	90.470	THORIUM PUMP DEPLOYED	7-Jul	19:20
477	7-Jul	1:25 PM	9.000	90.470	THORIUM PUMP AT DEPTH	7-Jul	19:25
478	7-Jul	2:39 PM	8.999	90.469	THORIUM PUMP RECOVERED	7-Jul	20:39
479	7-Jul	2:43 PM	8.999	90.469	FRRF DEPLOYED	7-Jul	20:43
480	7-Jul	2:48 PM	8.999	90.469	FRRF AT DEPTH	7-Jul	20:47
481	7-Jul	3:10 PM	8.999	90.470	FRRF RECOVERED	7-Jul	21:10

482	7-Jul	3:23 PM	8.997	90.470	PHYTO NET DEPLOYED	7-Jul	21:22
483	7-Jul	5:35 PM	8.976	90.471	PHYTO NET RECOVERED	7-Jul	23:34
484	7-Jul	6:03 PM	8.980	90.451	FRRF DEPLOYED	8-Jul	0:03
485	7-Jul	6:19 PM	8.977	90.449	FRRF RECOVERED	8-Jul	0:19
486	7-Jul	7:05 PM	8.987	90.417	CTD DEPLOYED	8-Jul	1:05
487	7-Jul	7:14 PM	8.986	90.416	CTD AT DEPTH	8-Jul	1:14
488	7-Jul	7:21 PM	8.985	90.416	CTD RECOVERED	8-Jul	1:20
489	7-Jul	8:02 PM	8.980	90.411	ZOOPLANKTON NET DEPLOYED	8-Jul	2:02
490	7-Jul	8:13 PM	8.977	90.410	ZOOPLANKTON NET RECOVERED	8-Jul	2:13
491	7-Jul	9:03 PM	8.976	90.392	THORIUM PUMP DEPLOYED	8-Jul	3:03
492	7-Jul	9:14 PM	8.976	90.390	THORIUM PUMP AT DEPTH	8-Jul	3:13
493	7-Jul	11:33 PM	8.969	90.382	THORIUM PUMP RECOVERED	8-Jul	5:32
494	7-Jul	11:33 PM	8.969	90.382	ZOOPLANKTON NET DEPLOYED	8-Jul	5:33
495	7-Jul	11:52 PM	8.963	90.378	ZOOPLANKTON NET RECOVERED	8-Jul	5:52
496	7-Jul	11:57 PM	8.961	90.378	ZOOPLANKTON NET DEPLOYED	8-Jul	5:56
497	8-Jul	12:12 AM	8.957	90.379	ZOOPLANKTON NET RECOVERED	8-Jul	6:12
498	8-Jul	12:19 AM	8.956	90.379	FRRF DEPLOYED	8-Jul	6:19
499	8-Jul	12:33 AM	8.955	90.378	FRRF AT DEPTH	8-Jul	6:33
500	8-Jul	12:44 AM	8.954	90.378	FRRF RECOVERED	8-Jul	6:43
501	8-Jul	1:37 AM	8.952	90.328	CTD DEPLOYED	8-Jul	7:37
502	8-Jul	1:53 AM	8.952	90.328	CTD AT DEPTH	8-Jul	7:37
503	8-Jul	2:17 AM	8.948	90.330	CTD RECOVERED	8-Jul	8:16
504	8-Jul	3:38 AM	8.926	90.317	DRIFTER RECOVERED	8-Jul	9:38
505	8-Jul	3:42 AM	8.925	90.316	DRIFTER RECOVERED	8-Jul	9:41
506	8-Jul	3:44 AM	8.924	90.316	DRIFTER DEPLOYED	8-Jul	9:44
507	8-Jul	4:51 AM	8.963	90.397	FRRF DEPLOYED	8-Jul	10:51
508	8-Jul	5:07 AM	8.961	90.396	FRRF AT DEPTH	8-Jul	11:07
509	8-Jul	5:17 AM	8.959	90.396	FRRF RECOVERED	8-Jul	11:17
510	8-Jul	5:45 AM	8.966	90.418	SEDTRAP RECOVERED	8-Jul	11:44
511	9-Jul	1:16 AM	10.416	92.916	STATION ARRIVAL	9-Jul	7:16
512	9-Jul	2:03 AM	10.416	92.916	SEDTRAP DEPLOYED	9-Jul	8:03
513	9-Jul	2:23 AM	10.416	92.917	CTD DEPLOYED	9-Jul	8:23
514	9-Jul	2:37 AM	10.415	92.918	CTD AT DEPTH	9-Jul	8:37
515	9-Jul	3:04 AM	10.414	92.918	CTD RECOVERED	9-Jul	9:03
516	9-Jul	4:46 AM	10.387	92.908	DRIFTER DEPLOYED	9-Jul	10:46
517	9-Jul	5:00 AM	10.383	92.907	FRRF DEPLOYED	9-Jul	11:00
518	9-Jul	5:15 AM	10.380	92.906	FRRF AT DEPTH	9-Jul	11:15
519	9-Jul	5:25 AM	10.377	92.906	FRRF RECOVERED	9-Jul	11:25
520	9-Jul	5:32 AM	10.376	92.905	CTD DEPLOYED	9-Jul	11:31
521	9-Jul	6:01 AM	10.369	92.905	CTD AT DEPTH	9-Jul	12:01
522	9-Jul	6:55 AM	10.363	92.902	CTD RECOVERED	9-Jul	12:55
523	9-Jul	8:04 AM	10.340	92.896	CTD DEPLOYED	9-Jul	14:03
524	9-Jul	8:22 AM	10.336	92.895	CTD AT DEPTH	9-Jul	14:21
525	9-Jul	8:51 AM	10.329	92.891	CTD RECOVERED	9-Jul	14:51
526	9-Jul	9:04 AM	10.325	92.892	FRRF DEPLOYED	9-Jul	15:04
527	9-Jul	9:22 AM	10.322	92.893	FRRF AT DEPTH	9-Jul	15:21
528	9-Jul	9:28 AM	10.321	92.893	FRRF RECOVERED	9-Jul	15:27
529	9-Jul	9:58 AM	10.314	92.892	TRACE METAL DEPLOYED	9-Jul	15:58
530	9-Jul	10:39 AM	10.307	92.895	TRACE METAL RECOVERED	9-Jul	16:39
531	9-Jul	11:00 AM	10.300	92.893	ZOOPLANKTON NET DEPLOYED	9-Jul	17:00
532	9-Jul	11:14 AM	10.295	92.900	ZOOPLANKTON NET RECOVERED	9-Jul	17:14
533	9-Jul	11:19 AM	10.293	92.903	ZOOPLANKTON NET DEPLOYED	9-Jul	17:19
534	9-Jul	11:26 AM	10.291	92.907	ZOOPLANKTON NET RECOVERED	9-Jul	17:26
535	9-Jul	12:19 PM	10.290	92.903	FRRF DEPLOYED	9-Jul	18:18

536	9-Jul	12:19 PM	10.290	92.903	FRRF AT DEPTH	9-Jul	18:18
537	9-Jul	12:19 PM	10.290	92.903	FRRF RECOVERED	9-Jul	18:19
538	9-Jul	12:26 PM	10.290	92.904	TRACE METAL DEPLOYED	9-Jul	18:26
539	9-Jul	12:31 PM	10.290	92.904	TRACE METAL AT DEPTH	9-Jul	18:31
540	9-Jul	1:11 PM	10.273	92.898	TRACE METAL RECOVERED	9-Jul	19:11
541	9-Jul	2:58 PM	10.253	92.903	FRRF DEPLOYED	9-Jul	20:58
542	9-Jul	3:10 PM	10.252	92.904	FRRF AT DEPTH	9-Jul	21:10
543	9-Jul	3:20 PM	10.251	92.904	FRRF RECOVERED	9-Jul	21:20
544	9-Jul	5:58 PM	10.221	92.915	FRRF DEPLOYED	9-Jul	23:57
545	9-Jul	6:09 PM	10.220	92.915	FRRF AT DEPTH	10-Jul	0:09
546	9-Jul	6:20 PM	10.220	92.915	FRRF RECOVERED	10-Jul	0:20
547	9-Jul	6:58 PM	10.216	92.917	CTD DEPLOYED	10-Jul	0:58
548	9-Jul	7:08 PM	10.215	92.918	CTD AT DEPTH	10-Jul	1:08
549	9-Jul	7:22 PM	10.214	92.919	CTD RECOVERED	10-Jul	1:22
550	9-Jul	8:15 PM	10.205	92.923	THORIUM PUMP DEPLOYED	10-Jul	2:15
551	9-Jul	8:21 PM	10.204	92.923	THORIUM PUMP AT DEPTH	10-Jul	2:20
552	9-Jul	9:21 PM	10.200	92.926	THORIUM PUMP RECOVERED	10-Jul	3:20
553	9-Jul	9:35 PM	10.197	92.927	ZOOPLANKTON NET DEPLOYED	10-Jul	3:35
554	9-Jul	9:40 PM	10.197	92.926	ZOOPLANKTON NET RECOVERED	10-Jul	3:40
555	9-Jul	9:45 PM	10.199	92.926	ZOOPLANKTON NET DEPLOYED	10-Jul	3:45
556	9-Jul	10:07 PM	10.200	92.919	ZOOPLANKTON NET RECOVERED	10-Jul	4:06
557	9-Jul	10:16 PM	10.203	92.919	ZOOPLANKTON NET DEPLOYED	10-Jul	4:16
558	9-Jul	10:34 PM	10.207	92.921	ZOOPLANKTON NET RECOVERED	10-Jul	4:34
559	9-Jul	10:45 PM	10.210	92.923	ZOOPLANKTON NET DEPLOYED	10-Jul	4:44
560	9-Jul	10:59 PM	10.213	92.925	ZOOPLANKTON NET RECOVERED	10-Jul	4:58
561	9-Jul	11:57 PM	10.178	92.936	FRRF DEPLOYED	10-Jul	5:57
562	10-Jul	12:12 AM	10.179	92.937	FRRF AT DEPTH	10-Jul	6:12
563	10-Jul	12:21 AM	10.179	92.937	FRRF RECOVERED	10-Jul	6:21
564	10-Jul	2:02 AM	10.172	92.947	CTD DEPLOYED	10-Jul	8:02
565	10-Jul	2:19 AM	10.173	92.947	CTD AT DEPTH	10-Jul	8:19
566	10-Jul	2:37 AM	10.175	92.947	CTD RECOVERED	10-Jul	8:37
567	10-Jul	4:18 AM	10.152	92.951	DRIFTER RECOVERED	10-Jul	10:17
568	10-Jul	4:57 AM	10.155	92.952	FRRF DEPLOYED	10-Jul	10:57
569	10-Jul	5:10 AM	10.154	92.953	FRRF AT DEPTH	10-Jul	11:10
570	10-Jul	5:19 AM	10.154	92.954	FRRF RECOVERED	10-Jul	11:18
571	10-Jul	6:07 AM	10.150	92.957	TRACE METAL DEPLOYED	10-Jul	12:07
572	10-Jul	6:10 AM	10.150	92.957	TRACE METAL AT DEPTH	10-Jul	12:10
573	10-Jul	6:17 AM	10.149	92.958	TRACE METAL RECOVERED	10-Jul	12:17
574	10-Jul	6:29 AM	10.149	92.959	CTD DEPLOYED	10-Jul	12:29
575	10-Jul	6:58 AM	10.146	92.961	CTD AT DEPTH	10-Jul	12:58
576	10-Jul	7:56 AM	10.140	92.965	CTD RECOVERED	10-Jul	13:56
577	10-Jul	8:08 AM	10.137	92.963	TRACE METAL DEPLOYED	10-Jul	14:08
578	10-Jul	8:11 AM	10.137	92.963	TRACE METAL AT DEPTH	10-Jul	14:11
579	10-Jul	8:17 AM	10.136	92.964	TRACE METAL RECOVERED	10-Jul	14:17
580	10-Jul	11:30 AM	10.124	92.988	FRRF DEPLOYED	10-Jul	17:30
581	10-Jul	12:01 PM	10.123	92.989	FRRF RECOVERED	10-Jul	18:01
582	10-Jul	12:06 PM	10.124	92.987	ZOOPLANKTON NET DEPLOYED	10-Jul	18:06
583	10-Jul	12:15 PM	10.124	92.986	ZOOPLANKTON NET RECOVERED	10-Jul	18:15
584	10-Jul	12:22 PM	10.124	92.984	ZOOPLANKTON NET DEPLOYED	10-Jul	18:22
585	10-Jul	12:37 PM	10.122	92.981	ZOOPLANKTON NET RECOVERED	10-Jul	18:37
586	10-Jul	2:00 PM	10.125	92.996	TRACE METAL DEPLOYED	10-Jul	20:00
587	10-Jul	2:16 PM	10.125	92.995	TRACE METAL AT DEPTH	10-Jul	20:16
588	10-Jul	2:45 PM	10.125	92.994	TRACE METAL RECOVERED	10-Jul	20:45
589	10-Jul	3:45 PM	10.130	93.002	FRRF DEPLOYED	10-Jul	21:45

590	10-Jul	4:05 PM	10.131	93.000	FRRF RECOVERED	10-Jul	22:05
591	10-Jul	4:10 PM	10.131	93.000	THORIUM PUMP DEPLOYED	10-Jul	22:10
592	10-Jul	4:23 PM	10.132	93.000	THORIUM PUMP AT DEPTH	10-Jul	22:23
593	10-Jul	5:35 PM	10.129	92.995	THORIUM PUMP RECOVERED	10-Jul	23:35
594	10-Jul	6:21 PM	10.130	92.994	FRRF RECOVERED	11-Jul	0:20
595	10-Jul	6:28 PM	10.130	92.996	CTD DEPLOYED	11-Jul	0:28
596	10-Jul	6:36 PM	10.131	92.997	CTD AT DEPTH	11-Jul	0:36
597	10-Jul	6:54 PM	10.132	92.998	CTD RECOVERED	11-Jul	0:54
598	10-Jul	9:00 PM	10.115	93.001	ZOOPLANKTON NET DEPLOYED	11-Jul	3:00
599	10-Jul	9:04 PM	10.117	93.001	ZOOPLANKTON NET RECOVERED	11-Jul	3:04
600	10-Jul	9:22 PM	10.123	93.001	ZOOPLANKTON NET DEPLOYED	11-Jul	3:21
601	10-Jul	9:39 PM	10.128	92.998	ZOOPLANKTON NET RECOVERED	11-Jul	3:39
602	10-Jul	9:47 PM	10.131	92.997	ZOOPLANKTON NET DEPLOYED	11-Jul	3:47
603	10-Jul	10:10 PM	10.132	92.988	ZOOPLANKTON NET RECOVERED	11-Jul	4:10
604	10-Jul	10:37 PM	10.126	92.987	ZOOPLANKTON NET DEPLOYED	11-Jul	4:37
605	10-Jul	11:03 PM	10.128	92.991	ZOOPLANKTON NET RECOVERED	11-Jul	5:02
606	10-Jul	11:29 PM	10.127	92.994	FRRF DEPLOYED	11-Jul	5:29
607	10-Jul	11:45 PM	10.129	92.994	FRRF AT DEPTH	11-Jul	5:44
608	10-Jul	11:54 PM	10.130	92.994	FRRF RECOVERED	11-Jul	5:54
609	11-Jul	2:03 AM	10.136	92.985	CTD DEPLOYED	11-Jul	8:03
610	11-Jul	2:15 AM	10.136	92.984	CTD AT DEPTH	11-Jul	8:15
611	11-Jul	2:41 AM	10.137	92.981	CTD RECOVERED	11-Jul	8:41
612	11-Jul	2:47 AM	10.137	92.981	CTD DEPLOYED	11-Jul	8:46
613	11-Jul	2:50 AM	10.137	92.980	CTD RECOVERED	11-Jul	8:49
614	11-Jul	4:30 AM	10.133	92.984	DRIFTER RECOVERED	11-Jul	10:30
615	11-Jul	4:49 AM	10.132	92.978	DRIFTER DEPLOYED	11-Jul	10:49
616	11-Jul	4:59 AM	10.131	92.976	FRRF DEPLOYED	11-Jul	10:59
617	11-Jul	5:12 AM	10.130	92.975	FRRF AT DEPTH	11-Jul	11:12
618	11-Jul	5:20 AM	10.130	92.974	FRRF RECOVERED	11-Jul	11:20
619	11-Jul	6:08 AM	10.127	92.966	CTD DEPLOYED	11-Jul	12:08
620	11-Jul	6:26 AM	10.126	92.963	CTD AT DEPTH	11-Jul	12:26
621	11-Jul	6:42 AM	10.126	92.961	CTD RECOVERED	11-Jul	12:42
622	11-Jul	8:05 AM	10.119	92.956	TRACE METAL DEPLOYED	11-Jul	14:05
623	11-Jul	8:12 AM	10.118	92.955	TRACE METAL AT DEPTH	11-Jul	14:11
624	11-Jul	8:14 AM	10.117	92.956	TRACE METAL RECOVERED	11-Jul	14:14
625	11-Jul	9:07 AM	10.113	92.954	MOCNESS DEPLOYED	11-Jul	15:07
626	11-Jul	11:41 AM	10.140	93.019	MOCNESS RECOVERED	11-Jul	17:41
627	11-Jul	12:45 PM	10.091	92.929	FRRF DEPLOYED	11-Jul	18:45
628	11-Jul	12:59 PM	10.090	92.929	FRRF AT DEPTH	11-Jul	18:59
629	11-Jul	1:06 PM	10.090	92.929	FRRF RECOVERED	11-Jul	19:06
630	11-Jul	1:19 PM	10.090	92.932	ZOOPLANKTON NET DEPLOYED	11-Jul	19:19
631	11-Jul	1:33 PM	10.092	92.933	ZOOPLANKTON NET RECOVERED	11-Jul	19:32
632	11-Jul	1:39 PM	10.091	92.934	ZOOPLANKTON NET DEPLOYED	11-Jul	19:39
633	11-Jul	3:39 PM	10.079	92.943	ZOOPLANKTON NET RECOVERED	11-Jul	21:38
634	11-Jul	3:46 PM	10.078	92.943	TRACE METAL DEPLOYED	11-Jul	21:46
635	11-Jul	4:02 PM	10.076	92.943	TRACE METAL AT DEPTH	11-Jul	22:02
636	11-Jul	4:08 PM	10.076	92.943	TRACE METAL RECOVERED	11-Jul	22:08
637	11-Jul	4:13 PM	10.076	92.943	PHYTO NET DEPLOYED	11-Jul	22:12
638	11-Jul	4:35 PM	10.078	92.950	PHYTO NET RECOVERED	11-Jul	22:35
639	11-Jul	4:44 PM	10.077	92.950	CTD DEPLOYED	11-Jul	22:43
640	11-Jul	5:02 PM	10.075	92.951	CTD AT DEPTH	11-Jul	23:02
641	11-Jul	5:31 PM	10.074	92.953	CTD RECOVERED	11-Jul	23:31
642	11-Jul	6:27 PM	10.056	92.914	FRRF DEPLOYED	12-Jul	0:27
643	11-Jul	6:42 PM	10.055	92.914	FRRF AT DEPTH	12-Jul	0:42

644	11-Jul	6:48 PM	10.054	92.914	FRRF RECOVERED	12-Jul	0:48
645	11-Jul	7:01 PM	10.052	92.913	CTD DEPLOYED	12-Jul	1:01
646	11-Jul	7:11 PM	10.050	92.913	CTD AT DEPTH	12-Jul	1:11
647	11-Jul	7:23 PM	10.048	92.913	CTD RECOVERED	12-Jul	1:23
648	11-Jul	7:29 PM	10.047	92.912	CTD DEPLOYED	12-Jul	1:29
649	11-Jul	7:32 PM	10.046	92.912	CTD AT DEPTH	12-Jul	1:32
650	11-Jul	7:35 PM	10.046	92.912	CTD RECOVERED	12-Jul	1:35
651	11-Jul	8:03 PM	10.041	92.912	ZOOPLANKTON NET DEPLOYED	12-Jul	2:02
652	11-Jul	8:26 PM	10.042	92.914	ZOOPLANKTON NET RECOVERED	12-Jul	2:26
653	11-Jul	8:32 PM	10.043	92.914	ZOOPLANKTON NET DEPLOYED	12-Jul	2:32
654	11-Jul	8:57 PM	10.044	92.916	ZOOPLANKTON NET RECOVERED	12-Jul	2:56
655	11-Jul	9:08 PM	10.044	92.917	FRRF DEPLOYED	12-Jul	3:08
656	11-Jul	9:23 PM	10.041	92.917	FRRF AT DEPTH	12-Jul	3:23
657	11-Jul	9:29 PM	10.040	92.917	FRRF RECOVERED	12-Jul	3:29
658	11-Jul	9:37 PM	10.039	92.917	ZOOPLANKTON NET DEPLOYED	12-Jul	3:36
659	11-Jul	9:51 PM	10.042	92.918	ZOOPLANKTON NET RECOVERED	12-Jul	3:50
660	11-Jul	10:15 PM	10.043	92.918	MOCNESS DEPLOYED	12-Jul	4:15
661	12-Jul	12:30 AM	10.097	92.898	MOCNESS RECOVERED	12-Jul	6:30
662	12-Jul	2:05 AM	9.975	92.916	CTD DEPLOYED	12-Jul	8:05
663	12-Jul	2:19 AM	9.975	92.917	CTD AT DEPTH	12-Jul	8:19
664	12-Jul	2:40 AM	9.975	92.918	CTD RECOVERED	12-Jul	8:40
665	12-Jul	4:18 AM	9.960	92.919	DRIFTER RECOVERED	12-Jul	10:18
666	12-Jul	4:28 AM	9.959	92.919	DRIFTER DEPLOYED	12-Jul	10:28
667	12-Jul	4:54 AM	9.959	92.923	FRRF DEPLOYED	12-Jul	10:54
668	12-Jul	5:09 AM	9.957	92.922	FRRF AT DEPTH	12-Jul	11:09
669	12-Jul	5:17 AM	9.956	92.922	FRRF RECOVERED	12-Jul	11:17
670	12-Jul	5:54 AM	9.954	92.923	CTD DEPLOYED	12-Jul	11:54
671	12-Jul	6:53 AM	9.948	92.924	CTD AT DEPTH	12-Jul	12:53
672	12-Jul	8:35 AM	9.936	92.926	CTD RECOVERED	12-Jul	14:34
673	12-Jul	8:59 AM	9.933	92.926	FRRF DEPLOYED	12-Jul	14:59
674	12-Jul	9:19 AM	9.931	92.928	FRRF AT DEPTH	12-Jul	15:19
675	12-Jul	9:26 AM	9.931	92.928	FRRF RECOVERED	12-Jul	15:26
676	12-Jul	9:59 AM	9.928	92.931	TRACE METAL DEPLOYED	12-Jul	15:59
677	12-Jul	10:05 AM	9.928	92.931	TRACE METAL AT DEPTH	12-Jul	16:05
678	12-Jul	10:12 AM	9.928	92.931	TRACE METAL RECOVERED	12-Jul	16:12
679	12-Jul	11:07 AM	9.923	92.930	ZOOPLANKTON NET DEPLOYED	12-Jul	17:07
680	12-Jul	11:22 AM	9.915	92.929	ZOOPLANKTON NET RECOVERED	12-Jul	17:22
681	12-Jul	11:31 AM	9.912	92.929	ZOOPLANKTON NET DEPLOYED	12-Jul	17:31
682	12-Jul	11:34 AM	9.911	92.929	ZOOPLANKTON NET RECOVERED	12-Jul	17:34
683	12-Jul	12:07 PM	9.906	92.928	FRRF DEPLOYED	12-Jul	18:07
684	12-Jul	12:08 PM	9.906	92.928	FRRF AT DEPTH	12-Jul	18:08
685	12-Jul	12:29 PM	9.903	92.931	FRRF RECOVERED	12-Jul	18:29
686	12-Jul	12:34 PM	9.903	92.931	TRACE METAL DEPLOYED	12-Jul	18:34
687	12-Jul	12:55 PM	9.901	92.932	TRACE METAL AT DEPTH	12-Jul	18:54
688	12-Jul	1:14 PM	9.906	92.925	TRACE METAL RECOVERED	12-Jul	19:14
689	12-Jul	1:58 PM	9.896	92.932	FRRF DEPLOYED	12-Jul	19:58
690	12-Jul	2:28 PM	9.896	92.933	FRRF RECOVERED	12-Jul	20:28
691	12-Jul	2:34 PM	9.896	92.934	PHYTO NET DEPLOYED	12-Jul	20:34
692	12-Jul	4:39 PM	9.889	92.937	PHYTO NET RECOVERED	12-Jul	22:39
693	12-Jul	4:44 PM	9.889	92.936	THORIUM PUMP DEPLOYED	12-Jul	22:44
694	12-Jul	4:49 PM	9.889	92.936	THORIUM PUMP AT DEPTH	12-Jul	22:49
695	12-Jul	5:55 PM	9.886	92.934	THORIUM PUMP RECOVERED	12-Jul	23:55
696	12-Jul	5:57 PM	9.886	92.934	FRRF DEPLOYED	12-Jul	23:57
697	12-Jul	6:15 PM	9.885	92.933	FRRF AT DEPTH	13-Jul	0:15

698	12-Jul	6:20 PM	9.885	92.932	FRRF RECOVERED	13-Jul	0:19
699	12-Jul	7:10 PM	9.864	92.942	CTD DEPLOYED	13-Jul	1:10
700	12-Jul	7:18 PM	9.863	92.942	CTD AT DEPTH	13-Jul	1:18
701	12-Jul	7:30 PM	9.863	92.942	CTD RECOVERED	13-Jul	1:29
702	12-Jul	7:50 PM	9.860	92.945	ZOOPLANKTON NET DEPLOYED	13-Jul	1:50
703	12-Jul	7:50 PM	9.860	92.945	ZOOPLANKTON NET RECOVERED	13-Jul	1:50
704	12-Jul	9:05 PM	9.860	92.943	ZOOPLANKTON NET DEPLOYED	13-Jul	3:05
705	12-Jul	9:27 PM	9.855	92.939	ZOOPLANKTON NET RECOVERED	13-Jul	3:27
706	12-Jul	9:33 PM	9.854	92.937	ZOOPLANKTON NET DEPLOYED	13-Jul	3:32
707	12-Jul	9:56 PM	9.848	92.932	ZOOPLANKTON NET RECOVERED	13-Jul	3:56
708	12-Jul	10:05 PM	9.845	92.930	ZOOPLANKTON NET DEPLOYED	13-Jul	4:04
709	12-Jul	10:26 PM	9.840	92.925	ZOOPLANKTON NET RECOVERED	13-Jul	4:26
710	12-Jul	10:34 PM	9.838	92.923	MOCNESS DEPLOYED	13-Jul	4:33
711	12-Jul	10:48 PM	9.835	92.920	ZOOPLANKTON NET RECOVERED	13-Jul	4:48
712	13-Jul	12:00 AM	9.843	92.938	FRRF DEPLOYED	13-Jul	6:00
713	13-Jul	12:13 AM	9.842	92.938	FRRF AT DEPTH	13-Jul	6:12
714	13-Jul	12:22 AM	9.842	92.937	FRRF RECOVERED	13-Jul	6:22
715	13-Jul	1:33 AM	9.835	92.926	CTD DEPLOYED	13-Jul	7:33
716	13-Jul	1:50 AM	9.833	92.925	CTD AT DEPTH	13-Jul	7:50
717	13-Jul	2:08 AM	9.832	92.922	CTD RECOVERED	13-Jul	8:08
718	13-Jul	3:43 AM	9.817	92.946	DRIFTER RECOVERED	13-Jul	9:43
719	13-Jul	4:37 AM	9.868	92.941	FRRF DEPLOYED	13-Jul	10:36
720	13-Jul	4:51 AM	9.868	92.942	FRRF AT DEPTH	13-Jul	10:50
721	13-Jul	4:59 AM	9.867	92.941	FRRF RECOVERED	13-Jul	10:59
722	13-Jul	6:00 AM	9.862	92.941	SEDTRAP RECOVERED	13-Jul	12:00
723	13-Jul	6:46 AM	9.861	92.947	STATION DEPARTURE	13-Jul	12:45
724	14-Jul	10:23 PM	8.541	90.332	STATION ARRIVAL	15-Jul	4:23
725	14-Jul	10:23 PM	8.541	90.332	ZOOPLANKTON NET DEPLOYED	15-Jul	4:23
726	14-Jul	10:42 PM	8.549	90.334	ZOOPLANKTON NET RECOVERED	15-Jul	4:42
727	14-Jul	10:50 PM	8.552	90.334	ZOOPLANKTON NET DEPLOYED	15-Jul	4:50
728	14-Jul	11:11 PM	8.558	90.330	ZOOPLANKTON NET RECOVERED	15-Jul	5:11
729	14-Jul	11:20 PM	8.560	90.328	ZOOPLANKTON NET DEPLOYED	15-Jul	5:20
730	14-Jul	11:35 PM	8.563	90.325	ZOOPLANKTON NET RECOVERED	15-Jul	5:35
731	15-Jul	1:50 AM	8.546	90.399	SEDTRAP DEPLOYED	15-Jul	7:50
732	15-Jul	2:01 AM	8.544	90.400	CTD DEPLOYED	15-Jul	8:01
733	15-Jul	2:19 AM	8.545	90.399	CTD AT DEPTH	15-Jul	8:19
734	15-Jul	2:42 AM	8.544	90.397	CTD RECOVERED	15-Jul	8:41
735	15-Jul	4:18 AM	8.554	90.389	DRIFTER DEPLOYED	15-Jul	10:17
736	15-Jul	5:00 AM	8.555	90.384	FRRF DEPLOYED	15-Jul	11:00
737	15-Jul	5:13 AM	8.555	90.384	FRRF AT DEPTH	15-Jul	11:13
738	15-Jul	5:21 AM	8.555	90.384	FRRF RECOVERED	15-Jul	11:21
739	15-Jul	5:31 AM	8.554	90.383	CTD DEPLOYED	15-Jul	11:30
740	15-Jul	5:52 AM	8.554	90.382	CTD AT DEPTH	15-Jul	11:52
741	15-Jul	6:40 AM	8.557	90.381	CTD RECOVERED	15-Jul	12:40
742	15-Jul	8:05 AM	8.563	90.382	CTD DEPLOYED	15-Jul	14:04
743	15-Jul	8:13 AM	8.563	90.382	CTD AT DEPTH	15-Jul	14:12
744	15-Jul	8:32 AM	8.565	90.381	CTD RECOVERED	15-Jul	14:31
745	15-Jul	9:13 AM	8.568	90.380	FRRF DEPLOYED	15-Jul	15:12
746	15-Jul	9:21 AM	8.568	90.380	FRRF RECOVERED	15-Jul	15:21
747	15-Jul	9:58 AM	8.572	90.373	TRACE METAL DEPLOYED	15-Jul	15:58
748	15-Jul	10:14 AM	8.572	90.372	TRACE METAL AT DEPTH	15-Jul	16:13
749	15-Jul	10:40 AM	8.572	90.372	TRACE METAL RECOVERED	15-Jul	16:40
750	15-Jul	11:00 AM	8.574	90.366	ZOOPLANKTON NET DEPLOYED	15-Jul	16:59
751	15-Jul	11:09 AM	8.571	90.365	ZOOPLANKTON NET RECOVERED	15-Jul	17:09

752	15-Jul	11:16 AM	8.570	90.365	ZOOPLANKTON NET DEPLOYED	15-Jul	17:16
753	15-Jul	11:31 AM	8.566	90.365	ZOOPLANKTON NET RECOVERED	15-Jul	17:30
754	15-Jul	12:15 PM	8.571	90.359	FRRF DEPLOYED	15-Jul	18:15
755	15-Jul	12:55 PM	8.570	90.353	FRRF AT DEPTH	15-Jul	18:55
756	15-Jul	12:56 PM	8.570	90.353	FRRF RECOVERED	15-Jul	18:56
757	15-Jul	12:58 PM	8.570	90.353	TRACE METAL DEPLOYED	15-Jul	18:58
758	15-Jul	1:09 PM	8.570	90.353	TRACE METAL AT DEPTH	15-Jul	19:09
759	15-Jul	1:27 PM	8.569	90.354	TRACE METAL RECOVERED	15-Jul	19:27
760	15-Jul	3:04 PM	8.564	90.342	FRRF DEPLOYED	15-Jul	21:04
761	15-Jul	3:12 PM	8.564	90.343	FRRF AT DEPTH	15-Jul	21:12
762	15-Jul	3:20 PM	8.564	90.343	FRRF RECOVERED	15-Jul	21:20
763	15-Jul	3:41 PM	8.564	90.344	PHYTO NET DEPLOYED	15-Jul	21:41
764	15-Jul	5:36 PM	8.557	90.354	PHYTO NET RECOVERED	15-Jul	23:36
765	15-Jul	6:04 PM	8.554	90.344	FRRF DEPLOYED	16-Jul	0:03
766	15-Jul	6:19 PM	8.553	90.344	FRRF AT DEPTH	16-Jul	0:19
767	15-Jul	6:29 PM	8.552	90.345	FRRF RECOVERED	16-Jul	0:28
768	15-Jul	7:01 PM	8.555	90.326	CTD DEPLOYED	16-Jul	1:00
769	15-Jul	7:08 PM	8.556	90.326	CTD AT DEPTH	16-Jul	1:07
770	15-Jul	7:17 PM	8.556	90.327	CTD RECOVERED	16-Jul	1:17
771	15-Jul	7:55 PM	8.555	90.328	ZOOPLANKTON NET DEPLOYED	16-Jul	1:54
772	15-Jul	8:04 PM	8.556	90.328	ZOOPLANKTON NET RECOVERED	16-Jul	2:04
773	15-Jul	8:16 PM	8.556	90.326	THORIUM PUMP DEPLOYED	16-Jul	2:15
774	15-Jul	9:34 PM	8.555	90.327	THORIUM PUMP RECOVERED	16-Jul	3:34
775	15-Jul	9:44 PM	8.554	90.329	ZOOPLANKTON NET DEPLOYED	16-Jul	3:44
776	15-Jul	10:10 PM	8.550	90.333	ZOOPLANKTON NET RECOVERED	16-Jul	4:09
777	15-Jul	10:18 PM	8.549	90.334	ZOOPLANKTON NET DEPLOYED	16-Jul	4:17
778	15-Jul	10:42 PM	8.543	90.340	ZOOPLANKTON NET RECOVERED	16-Jul	4:42
779	15-Jul	10:54 PM	8.540	90.343	ZOOPLANKTON NET DEPLOYED	16-Jul	4:53
780	15-Jul	11:03 PM	8.538	90.346	ZOOPLANKTON NET RECOVERED	16-Jul	5:03
780	15-Jul	11:03 PM	8.538	90.346	ZOOPLANKTON NET RECOVERED	16-Jul	5:03
781	15-Jul	11:46 PM	8.535	90.315	FRRF DEPLOYED	16-Jul	5:45
782	15-Jul	11:58 PM	8.534	90.316	FRRF AT DEPTH	16-Jul	5:57
783	16-Jul	12:06 AM	8.535	90.316	FRRF RECOVERED	16-Jul	6:06
784	16-Jul	12:21 AM	8.536	90.318	ZOOPLANKTON NET DEPLOYED	16-Jul	6:21
785	16-Jul	12:36 AM	8.539	90.320	ZOOPLANKTON NET RECOVERED	16-Jul	6:36
786	16-Jul	1:42 AM	8.533	90.322	ZOOPLANKTON NET DEPLOYED	16-Jul	7:41
787	16-Jul	2:01 AM	8.536	90.324	ZOOPLANKTON NET RECOVERED	16-Jul	8:01
788	16-Jul	2:10 AM	8.535	90.324	CTD DEPLOYED	16-Jul	8:10
789	16-Jul	2:24 AM	8.533	90.325	CTD AT DEPTH	16-Jul	8:24
790	16-Jul	2:46 AM	8.533	90.325	CTD RECOVERED	16-Jul	8:45
791	16-Jul	4:39 AM	8.519	90.314	DRIFTER RECOVERED	16-Jul	10:39
792	16-Jul	4:52 AM	8.519	90.316	DRIFTER DEPLOYED	16-Jul	10:52
793	16-Jul	5:01 AM	8.519	90.318	FRRF DEPLOYED	16-Jul	11:00
794	16-Jul	5:14 AM	8.518	90.318	FRRF AT DEPTH	16-Jul	11:13
795	16-Jul	5:21 AM	8.518	90.318	FRRF RECOVERED	16-Jul	11:21
796	16-Jul	6:01 AM	8.517	90.320	TRACE METAL DEPLOYED	16-Jul	12:01
797	16-Jul	6:04 AM	8.516	90.320	TRACE METAL AT DEPTH	16-Jul	12:04
798	16-Jul	6:10 AM	8.516	90.320	TRACE METAL RECOVERED	16-Jul	12:10
799	16-Jul	6:18 AM	8.516	90.321	CTD DEPLOYED	16-Jul	12:17
800	16-Jul	6:38 AM	8.515	90.321	CTD AT DEPTH	16-Jul	12:38
801	16-Jul	7:22 AM	8.513	90.321	CTD RECOVERED	16-Jul	13:22
802	16-Jul	7:24 AM	8.513	90.321	SEDTRAP DEPLOYED	16-Jul	13:23
803	16-Jul	7:43 AM	8.513	90.322	TRACE METAL DEPLOYED	16-Jul	13:43
804	16-Jul	7:43 AM	8.513	90.322	TRACE METAL RECOVERED	16-Jul	13:43

804	16-Jul	7:44 AM	8.513	90.322	TRACE METAL AT DEPTH	16-Jul	13:43
805	16-Jul	7:49 AM	8.513	90.322	TRACE METAL RECOVERED	16-Jul	13:48
806	16-Jul	9:09 AM	8.504	90.326	ZOOPLANKTON NET DEPLOYED	16-Jul	15:09
807	16-Jul	9:27 AM	8.507	90.327	ZOOPLANKTON NET RECOVERED	16-Jul	15:26
808	16-Jul	11:29 AM	8.504	90.327	FRRF DEPLOYED	16-Jul	17:29
809	16-Jul	11:48 AM	8.504	90.329	FRRF AT DEPTH	16-Jul	17:48
810	16-Jul	11:54 AM	8.504	90.329	FRRF RECOVERED	16-Jul	17:53
811	16-Jul	12:36 PM	8.506	90.330	ZOOPLANKTON NET DEPLOYED	16-Jul	18:35
812	16-Jul	12:49 PM	8.509	90.328	ZOOPLANKTON NET RECOVERED	16-Jul	18:49
813	16-Jul	12:53 PM	8.510	90.328	ZOOPLANKTON NET DEPLOYED	16-Jul	18:53
814	16-Jul	1:07 PM	8.513	90.326	ZOOPLANKTON NET RECOVERED	16-Jul	19:06
815	16-Jul	1:19 PM	8.514	90.326	ZOOPLANKTON NET DEPLOYED	16-Jul	19:18
816	16-Jul	1:33 PM	8.517	90.326	ZOOPLANKTON NET RECOVERED	16-Jul	19:32
817	16-Jul	1:59 PM	8.498	90.332	TRACE METAL DEPLOYED	16-Jul	19:58
818	16-Jul	2:15 PM	8.498	90.332	TRACE METAL AT DEPTH	16-Jul	20:14
819	16-Jul	2:38 PM	8.499	90.332	TRACE METAL RECOVERED	16-Jul	20:38
820	16-Jul	3:00 PM	8.493	90.337	FRRF DEPLOYED	16-Jul	21:00
821	16-Jul	3:16 PM	8.494	90.337	FRRF AT DEPTH	16-Jul	21:16
822	16-Jul	3:22 PM	8.494	90.337	FRRF RECOVERED	16-Jul	21:21
823	16-Jul	3:55 PM	8.491	90.340	THORIUM PUMP DEPLOYED	16-Jul	21:55
824	16-Jul	4:06 PM	8.491	90.340	THORIUM PUMP AT DEPTH	16-Jul	22:06
825	16-Jul	6:07 PM	8.492	90.340	THORIUM PUMP RECOVERED	17-Jul	0:07
826	16-Jul	6:25 PM	8.483	90.341	FRRF DEPLOYED	17-Jul	0:24
827	16-Jul	6:37 PM	8.484	90.342	FRRF AT DEPTH	17-Jul	0:37
828	16-Jul	6:45 PM	8.484	90.342	FRRF RECOVERED	17-Jul	0:45
829	16-Jul	6:52 PM	8.485	90.342	CTD DEPLOYED	17-Jul	0:52
830	16-Jul	7:10 PM	8.486	90.341	CTD AT DEPTH	17-Jul	1:09
831	16-Jul	7:36 PM	8.488	90.341	CTD RECOVERED	17-Jul	1:35
832	16-Jul	8:18 PM	8.481	90.342	ZOOPLANKTON NET DEPLOYED	17-Jul	2:17
833	16-Jul	8:43 PM	8.488	90.341	ZOOPLANKTON NET RECOVERED	17-Jul	2:43
834	16-Jul	8:44 PM	8.488	90.341	ZOOPLANKTON NET DEPLOYED	17-Jul	2:44
835	16-Jul	9:17 PM	8.500	90.335	ZOOPLANKTON NET RECOVERED	17-Jul	3:16
836	16-Jul	9:17 PM	8.500	90.335	ZOOPLANKTON NET DEPLOYED	17-Jul	3:16
837	16-Jul	9:38 PM	8.510	90.329	ZOOPLANKTON NET RECOVERED	17-Jul	3:38
838	16-Jul	9:53 PM	8.514	90.330	ZOOPLANKTON NET DEPLOYED	17-Jul	3:53
839	16-Jul	10:10 PM	8.521	90.328	ZOOPLANKTON NET RECOVERED	17-Jul	4:10
840	16-Jul	11:21 PM	8.488	90.374	ZOOPLANKTON NET DEPLOYED	17-Jul	5:21
841	16-Jul	11:28 PM	8.490	90.374	ZOOPLANKTON NET RECOVERED	17-Jul	5:28
842	16-Jul	11:36 PM	8.492	90.373	FRRF DEPLOYED	17-Jul	5:36
843	16-Jul	11:48 PM	8.494	90.371	FRRF AT DEPTH	17-Jul	5:47
844	16-Jul	11:58 PM	8.494	90.370	FRRF RECOVERED	17-Jul	5:58
845	17-Jul	1:14 AM	8.492	90.360	ZOOPLANKTON NET DEPLOYED	17-Jul	7:14
846	17-Jul	1:31 AM	8.490	90.358	ZOOPLANKTON NET RECOVERED	17-Jul	7:31
847	17-Jul	2:05 AM	8.500	90.375	CTD DEPLOYED	17-Jul	8:05
848	17-Jul	2:21 AM	8.501	90.374	CTD AT DEPTH	17-Jul	8:21
849	17-Jul	2:40 AM	8.501	90.373	CTD RECOVERED	17-Jul	8:39
850	17-Jul	4:22 AM	8.508	90.373	DRIFTER RECOVERED	17-Jul	10:22
851	17-Jul	4:40 AM	8.508	90.371	DRIFTER DEPLOYED	17-Jul	10:39
852	17-Jul	4:58 AM	8.508	90.368	FRRF DEPLOYED	17-Jul	10:58
853	17-Jul	5:11 AM	8.508	90.367	FRRF AT DEPTH	17-Jul	11:10
854	17-Jul	5:19 AM	8.508	90.367	FRRF RECOVERED	17-Jul	11:18
855	17-Jul	5:47 AM	8.513	90.364	TRACE METAL DEPLOYED	17-Jul	11:47
856	17-Jul	5:49 AM	8.513	90.364	TRACE METAL AT DEPTH	17-Jul	11:49
857	17-Jul	5:56 AM	8.513	90.364	TRACE METAL RECOVERED	17-Jul	11:55

858	17-Jul	6:08 AM	8.513	90.363	CTD DEPLOYED	17-Jul	12:07
859	17-Jul	6:23 AM	8.513	90.362	CTD AT DEPTH	17-Jul	12:22
860	17-Jul	6:46 AM	8.513	90.360	CTD RECOVERED	17-Jul	12:46
861	17-Jul	8:01 AM	8.529	90.355	TRACE METAL DEPLOYED	17-Jul	14:00
862	17-Jul	8:03 AM	8.530	90.355	TRACE METAL AT DEPTH	17-Jul	14:03
863	17-Jul	8:13 AM	8.531	90.355	TRACE METAL RECOVERED	17-Jul	14:13
864	17-Jul	9:10 AM	8.534	90.352	MOCNESS DEPLOYED	17-Jul	15:09
865	17-Jul	11:39 AM	8.481	90.404	MOCNESS RECOVERED	17-Jul	17:39
866	17-Jul	12:44 PM	8.558	90.329	FRRF DEPLOYED	17-Jul	18:44
867	17-Jul	12:57 PM	8.558	90.328	FRRF AT DEPTH	17-Jul	18:57
868	17-Jul	1:05 PM	8.557	90.327	FRRF RECOVERED	17-Jul	19:05
869	17-Jul	1:17 PM	8.556	90.326	ZOOPLANKTON NET DEPLOYED	17-Jul	19:17
870	17-Jul	1:32 PM	8.555	90.327	ZOOPLANKTON NET RECOVERED	17-Jul	19:31
871	17-Jul	1:51 PM	8.553	90.328	ZOOPLANKTON NET DEPLOYED	17-Jul	19:50
872	17-Jul	1:51 PM	8.553	90.328	ZOOPLANKTON NET RECOVERED	17-Jul	19:51
873	17-Jul	1:58 PM	8.554	90.328	PHYTO NET DEPLOYED	17-Jul	19:57
874	17-Jul	4:11 PM	8.552	90.325	PHYTO NET RECOVERED	17-Jul	22:11
875	17-Jul	4:56 PM	8.567	90.292	TRACE METAL DEPLOYED	17-Jul	22:56
876	17-Jul	4:58 PM	8.567	90.292	TRACE METAL AT DEPTH	17-Jul	22:58
877	17-Jul	5:06 PM	8.567	90.292	TRACE METAL RECOVERED	17-Jul	23:06
878	17-Jul	5:59 PM	8.569	90.283	FRRF DEPLOYED	17-Jul	23:59
879	17-Jul	6:09 PM	8.568	90.283	FRRF AT DEPTH	18-Jul	0:09
880	17-Jul	6:16 PM	8.568	90.282	FRRF RECOVERED	18-Jul	0:15
881	17-Jul	7:01 PM	8.570	90.273	CTD DEPLOYED	18-Jul	1:01
882	17-Jul	7:10 PM	8.570	90.273	CTD AT DEPTH	18-Jul	1:10
883	17-Jul	7:22 PM	8.569	90.271	CTD RECOVERED	18-Jul	1:22
884	17-Jul	7:39 PM	8.569	90.269	ZOOPLANKTON NET DEPLOYED	18-Jul	1:39
885	17-Jul	7:51 PM	8.568	90.268	ZOOPLANKTON NET RECOVERED	18-Jul	1:50
886	17-Jul	8:00 PM	8.567	90.265	ZOOPLANKTON NET DEPLOYED	18-Jul	1:59
887	17-Jul	8:33 PM	8.557	90.268	ZOOPLANKTON NET RECOVERED	18-Jul	2:33
888	17-Jul	9:10 PM	8.574	90.246	FRRF DEPLOYED	18-Jul	3:09
889	17-Jul	9:31 PM	8.575	90.244	FRRF RECOVERED	18-Jul	3:30
890	17-Jul	9:42 PM	8.573	90.243	ZOOPLANKTON NET DEPLOYED	18-Jul	3:42
891	17-Jul	9:55 PM	8.570	90.245	ZOOPLANKTON NET RECOVERED	18-Jul	3:55
892	17-Jul	10:15 PM	8.572	90.246	MOCNESS DEPLOYED	18-Jul	4:15
893	18-Jul	12:35 AM	8.572	90.288	MOCNESS RECOVERED	18-Jul	6:34
894	18-Jul	2:01 AM	8.583	90.182	CTD DEPLOYED	18-Jul	8:00
895	18-Jul	2:15 AM	8.583	90.181	CTD AT DEPTH	18-Jul	8:15
896	18-Jul	2:34 AM	8.583	90.180	CTD RECOVERED	18-Jul	8:33
897	18-Jul	4:25 AM	8.570	90.156	DRIFTER RECOVERED	18-Jul	10:24
898	18-Jul	4:34 AM	8.568	90.153	DRIFTER DEPLOYED	18-Jul	10:34
899	18-Jul	4:57 AM	8.564	90.145	FRRF DEPLOYED	18-Jul	10:57
900	18-Jul	5:10 AM	8.562	90.141	FRRF AT DEPTH	18-Jul	11:10
901	18-Jul	5:18 AM	8.560	90.140	FRRF RECOVERED	18-Jul	11:18
902	18-Jul	5:50 AM	8.558	90.131	CTD DEPLOYED	18-Jul	11:50
903	18-Jul	6:49 AM	8.549	90.125	CTD AT DEPTH	18-Jul	12:49
904	18-Jul	8:24 AM	8.535	90.124	CTD RECOVERED	18-Jul	14:24
905	18-Jul	9:02 AM	8.549	90.097	FRRF DEPLOYED	18-Jul	15:02
906	18-Jul	9:16 AM	8.550	90.095	FRRF AT DEPTH	18-Jul	15:16
907	18-Jul	9:25 AM	8.550	90.095	FRRF RECOVERED	18-Jul	15:25
908	18-Jul	10:01 AM	8.550	90.085	TRACE METAL DEPLOYED	18-Jul	16:01
909	18-Jul	10:07 AM	8.549	90.084	TRACE METAL AT DEPTH	18-Jul	16:07
910	18-Jul	10:12 AM	8.548	90.084	TRACE METAL RECOVERED	18-Jul	16:12
911	18-Jul	10:27 AM	8.542	90.081	ZOOPLANKTON NET DEPLOYED	18-Jul	16:27

912	18-Jul	10:41 AM	8.537	90.076	ZOOPLANKTON NET RECOVERED	18-Jul	16:41
913	18-Jul	11:17 AM	8.533	90.072	ZOOPLANKTON NET DEPLOYED	18-Jul	17:17
914	18-Jul	11:42 AM	8.527	90.072	ZOOPLANKTON NET RECOVERED	18-Jul	17:42
915	18-Jul	11:42 AM	8.527	90.072	FRRF DEPLOYED	18-Jul	17:42
916	18-Jul	11:58 AM	8.526	90.071	FRRF AT DEPTH	18-Jul	17:57
917	18-Jul	12:03 PM	8.526	90.071	FRRF RECOVERED	18-Jul	18:03
918	18-Jul	12:12 PM	8.525	90.069	TRACE METAL DEPLOYED	18-Jul	18:12
919	18-Jul	12:29 PM	8.524	90.068	TRACE METAL AT DEPTH	18-Jul	18:28
920	18-Jul	12:46 PM	8.524	90.068	TRACE METAL RECOVERED	18-Jul	18:45
921	18-Jul	1:58 PM	8.507	90.055	FRRF DEPLOYED	18-Jul	19:58
922	18-Jul	2:13 PM	8.507	90.053	FRRF AT DEPTH	18-Jul	20:13
923	18-Jul	2:21 PM	8.507	90.053	FRRF RECOVERED	18-Jul	20:21
924	18-Jul	3:18 PM	8.494	90.044	PHYTO NET DEPLOYED	18-Jul	21:18
925	18-Jul	3:20 PM	8.494	90.044	PHYTO NET RECOVERED	18-Jul	21:19
926	18-Jul	3:26 PM	8.493	90.042	THORIUM PUMP DEPLOYED	18-Jul	21:26
927	18-Jul	3:43 PM	8.492	90.042	THORIUM PUMP AT DEPTH	18-Jul	21:42
928	18-Jul	5:53 PM	8.484	90.042	THORIUM PUMP RECOVERED	18-Jul	23:53
929	18-Jul	6:33 PM	8.454	90.021	FRRF DEPLOYED	19-Jul	0:33
930	18-Jul	6:47 PM	8.453	90.021	FRRF AT DEPTH	19-Jul	0:47
931	18-Jul	6:56 PM	8.453	90.021	FRRF RECOVERED	19-Jul	0:55
932	18-Jul	7:07 PM	8.452	90.022	CTD DEPLOYED	19-Jul	1:06
933	18-Jul	7:15 PM	8.452	90.022	CTD AT DEPTH	19-Jul	1:15
934	18-Jul	7:24 PM	8.451	90.022	CTD RECOVERED	19-Jul	1:24
935	18-Jul	7:36 PM	8.449	90.020	ZOOPLANKTON NET DEPLOYED	19-Jul	1:36
936	18-Jul	7:52 PM	8.443	90.011	ZOOPLANKTON NET RECOVERED	19-Jul	1:51
937	18-Jul	8:07 PM	8.439	90.003	ZOOPLANKTON NET DEPLOYED	19-Jul	2:07
938	18-Jul	8:15 PM	8.436	90.000	ZOOPLANKTON NET RECOVERED	19-Jul	2:15
939	18-Jul	8:28 PM	8.432	89.994	ZOOPLANKTON NET DEPLOYED	19-Jul	2:28
940	18-Jul	8:40 PM	8.428	89.989	ZOOPLANKTON NET RECOVERED	19-Jul	2:40
941	18-Jul	8:47 PM	8.425	89.986	ZOOPLANKTON NET DEPLOYED	19-Jul	2:47
942	18-Jul	9:04 PM	8.419	89.979	ZOOPLANKTON NET RECOVERED	19-Jul	3:04
943	18-Jul	9:13 PM	8.418	89.976	THORIUM PUMP DEPLOYED	19-Jul	3:13
944	18-Jul	9:20 PM	8.418	89.974	THORIUM PUMP AT DEPTH	19-Jul	3:19
945	18-Jul	10:40 PM	8.417	89.968	THORIUM PUMP RECOVERED	19-Jul	4:39
946	18-Jul	11:29 PM	8.392	89.994	ZOOPLANKTON NET DEPLOYED	19-Jul	5:28
947	18-Jul	11:51 PM	8.380	90.001	ZOOPLANKTON NET RECOVERED	19-Jul	5:50
948	19-Jul	12:13 AM	8.376	90.002	FRRF DEPLOYED	19-Jul	6:13
949	19-Jul	12:18 AM	8.376	90.002	FRRF RECOVERED	19-Jul	6:18
950	19-Jul	1:45 AM	8.372	90.003	CTD DEPLOYED	19-Jul	7:45
951	19-Jul	1:50 AM	8.372	90.003	CTD AT DEPTH	19-Jul	7:50
952	19-Jul	2:13 AM	8.371	90.005	CTD RECOVERED	19-Jul	8:12
953	19-Jul	3:31 AM	8.340	90.026	DRIFTER RECOVERED	19-Jul	9:31
954	19-Jul	6:01 AM	8.404	90.232	SEDTRAP RECOVERED	19-Jul	12:00
955	19-Jul	7:40 PM	8.875	88.466	STATION ARRIVAL	20-Jul	1:40
956	19-Jul	10:31 PM	8.875	88.466	ZOOPLANKTON NET DEPLOYED	20-Jul	4:30
957	19-Jul	10:47 PM	8.873	88.463	ZOOPLANKTON NET RECOVERED	20-Jul	4:47
958	20-Jul	12:52 AM	8.877	88.465	SEDTRAP DEPLOYED	20-Jul	6:51
959	20-Jul	2:03 AM	8.877	88.462	CTD DEPLOYED	20-Jul	8:03
960	20-Jul	2:18 AM	8.878	88.462	CTD AT DEPTH	20-Jul	8:18
961	20-Jul	2:40 AM	8.878	88.461	CTD RECOVERED	20-Jul	8:40
962	20-Jul	4:28 AM	8.918	88.439	DRIFTER DEPLOYED	20-Jul	10:28
963	20-Jul	5:26 AM	8.926	88.429	CTD DEPLOYED	20-Jul	11:26
964	20-Jul	5:47 AM	8.927	88.427	CTD AT DEPTH	20-Jul	11:47
965	20-Jul	6:36 AM	8.935	88.417	CTD RECOVERED	20-Jul	12:36

966	20-Jul	8:25 AM	8.956	88.403	CTD DEPLOYED	20-Jul	14:24
967	20-Jul	8:25 AM	8.956	88.403	CTD AT DEPTH	20-Jul	14:25
968	20-Jul	8:49 AM	8.959	88.402	CTD RECOVERED	20-Jul	14:49
969	20-Jul	9:57 AM	8.977	88.390	TRACE METAL DEPLOYED	20-Jul	15:56
970	20-Jul	10:15 AM	8.980	88.389	TRACE METAL AT DEPTH	20-Jul	16:15
971	20-Jul	10:48 AM	8.984	88.385	TRACE METAL RECOVERED	20-Jul	16:48
972	20-Jul	10:53 AM	8.984	88.384	ZOOPLANKTON NET DEPLOYED	20-Jul	16:53
973	20-Jul	10:58 AM	8.984	88.382	ZOOPLANKTON NET RECOVERED	20-Jul	16:58
974	20-Jul	11:07 AM	8.984	88.380	ZOOPLANKTON NET DEPLOYED	20-Jul	17:07
975	20-Jul	11:25 AM	8.982	88.374	ZOOPLANKTON NET RECOVERED	20-Jul	17:25
976	20-Jul	1:03 PM	9.020	88.353	TRACE METAL DEPLOYED	20-Jul	19:03
977	20-Jul	1:15 PM	9.020	88.352	TRACE METAL AT DEPTH	20-Jul	19:15
978	20-Jul	1:27 PM	9.021	88.351	TRACE METAL RECOVERED	20-Jul	19:26
979	20-Jul	2:48 PM	9.033	88.336	PHYTO NET DEPLOYED	20-Jul	20:47
980	20-Jul	4:46 PM	9.031	88.324	PHYTO NET RECOVERED	20-Jul	22:45
981	20-Jul	5:30 PM	9.052	88.305	ZOOPLANKTON NET DEPLOYED	20-Jul	23:29
982	20-Jul	6:13 PM	9.048	88.301	ZOOPLANKTON NET RECOVERED	21-Jul	0:13
983	20-Jul	7:02 PM	9.057	88.289	CTD DEPLOYED	21-Jul	1:01
984	20-Jul	7:10 PM	9.056	88.288	CTD AT DEPTH	21-Jul	1:09
985	20-Jul	7:28 PM	9.056	88.287	CTD RECOVERED	21-Jul	1:28
986	20-Jul	8:15 PM	9.066	88.269	THORIUM PUMP DEPLOYED	21-Jul	2:14
987	20-Jul	8:18 PM	9.067	88.268	THORIUM PUMP AT DEPTH	21-Jul	2:18
988	20-Jul	9:14 PM	9.070	88.260	THORIUM PUMP RECOVERED	21-Jul	3:14
989	20-Jul	9:21 PM	9.070	88.259	ZOOPLANKTON NET DEPLOYED	21-Jul	3:20
990	20-Jul	9:39 PM	9.066	88.257	ZOOPLANKTON NET RECOVERED	21-Jul	3:39
991	20-Jul	9:40 PM	9.066	88.257	ZOOPLANKTON NET DEPLOYED	21-Jul	3:40
992	20-Jul	9:57 PM	9.063	88.254	ZOOPLANKTON NET RECOVERED	21-Jul	3:57
993	20-Jul	10:19 PM	9.059	88.251	ZOOPLANKTON NET DEPLOYED	21-Jul	4:18
993	20-Jul	10:19 PM	9.059	88.251	ZOOPLANKTON NET RECOVERED	21-Jul	4:19
993	20-Jul	10:20 PM	9.059	88.251	ZOOPLANKTON NET DEPLOYED	21-Jul	4:19
994	20-Jul	10:22 PM	9.059	88.251	ZOOPLANKTON NET RECOVERED	21-Jul	4:21
995	20-Jul	10:33 PM	9.057	88.249	ZOOPLANKTON NET DEPLOYED	21-Jul	4:32
996	20-Jul	10:50 PM	9.054	88.247	ZOOPLANKTON NET RECOVERED	21-Jul	4:49
997	20-Jul	10:56 PM	9.053	88.246	ZOOPLANKTON NET DEPLOYED	21-Jul	4:55
998	20-Jul	11:12 PM	9.050	88.244	ZOOPLANKTON NET RECOVERED	21-Jul	5:11
999	20-Jul	11:19 PM	9.048	88.243	ZOOPLANKTON NET DEPLOYED	21-Jul	5:19
1000	20-Jul	11:41 PM	9.041	88.243	ZOOPLANKTON NET RECOVERED	21-Jul	5:41
1001	21-Jul	2:04 AM	9.094	88.185	CTD DEPLOYED	21-Jul	8:04
1002	21-Jul	2:18 AM	9.095	88.183	CTD AT DEPTH	21-Jul	8:17
1003	21-Jul	2:39 AM	9.095	88.181	CTD RECOVERED	21-Jul	8:38
1004	21-Jul	4:19 AM	9.108	88.153	DRIFTER RECOVERED	21-Jul	10:19
1005	21-Jul	4:29 AM	9.108	88.149	DRIFTER DEPLOYED	21-Jul	10:28
1006	21-Jul	6:01 AM	9.113	88.125	TRACE METAL DEPLOYED	21-Jul	12:01
1007	21-Jul	6:03 AM	9.114	88.124	TRACE METAL AT DEPTH	21-Jul	12:03
1008	21-Jul	6:12 AM	9.114	88.122	TRACE METAL RECOVERED	21-Jul	12:11
1009	21-Jul	6:19 AM	9.115	88.121	CTD DEPLOYED	21-Jul	12:18
1010	21-Jul	6:38 AM	9.116	88.117	CTD AT DEPTH	21-Jul	12:38
1011	21-Jul	7:22 AM	9.119	88.106	CTD RECOVERED	21-Jul	13:22
1012	21-Jul	7:45 AM	9.120	88.101	TRACE METAL DEPLOYED	21-Jul	13:44
1013	21-Jul	7:46 AM	9.120	88.101	TRACE METAL AT DEPTH	21-Jul	13:46
1014	21-Jul	7:58 AM	9.121	88.097	TRACE METAL RECOVERED	21-Jul	13:58
1015	21-Jul	8:34 AM	9.124	88.087	ZOOPLANKTON NET DEPLOYED	21-Jul	14:33
1016	21-Jul	8:45 AM	9.122	88.085	ZOOPLANKTON NET RECOVERED	21-Jul	14:45
1017	21-Jul	1:07 PM	9.137	88.022	ZOOPLANKTON NET DEPLOYED	21-Jul	19:07

1018	21-Jul	1:24 PM	9.134	88.021	ZOOPLANKTON NET RECOVERED	21-Jul	19:24
1019	21-Jul	1:28 PM	9.133	88.020	ZOOPLANKTON NET DEPLOYED	21-Jul	19:28
1020	21-Jul	2:08 PM	9.143	88.008	ZOOPLANKTON NET RECOVERED	21-Jul	20:08
1021	21-Jul	2:09 PM	9.143	88.008	TRACE METAL DEPLOYED	21-Jul	20:08
1022	21-Jul	2:24 PM	9.142	88.005	TRACE METAL AT DEPTH	21-Jul	20:24
1023	21-Jul	2:51 PM	9.141	88.002	TRACE METAL RECOVERED	21-Jul	20:51
1024	21-Jul	3:51 PM	9.142	87.976	TRACE METAL DEPLOYED	21-Jul	21:51
1025	21-Jul	3:59 PM	9.142	87.975	TRACE METAL RECOVERED	21-Jul	21:59
1026	21-Jul	4:12 PM	9.141	87.974	ZOOPLANKTON NET DEPLOYED	21-Jul	22:11
1027	21-Jul	4:28 PM	9.141	87.978	ZOOPLANKTON NET RECOVERED	21-Jul	22:28
1028	21-Jul	4:31 PM	9.141	87.979	ZOOPLANKTON NET DEPLOYED	21-Jul	22:31
1029	21-Jul	4:46 PM	9.140	87.981	ZOOPLANKTON NET RECOVERED	21-Jul	22:45
1030	21-Jul	4:51 PM	9.139	87.982	ZOOPLANKTON NET DEPLOYED	21-Jul	22:51
1031	21-Jul	5:10 PM	9.138	87.983	ZOOPLANKTON NET RECOVERED	21-Jul	23:10
1032	21-Jul	6:34 PM	9.135	87.957	CTD DEPLOYED	22-Jul	0:34
1033	21-Jul	6:43 PM	9.134	87.957	CTD AT DEPTH	22-Jul	0:43
1034	21-Jul	6:57 PM	9.133	87.956	CTD RECOVERED	22-Jul	0:56
1035	21-Jul	7:36 PM	9.132	87.954	ZOOPLANKTON NET DEPLOYED	22-Jul	1:35
1036	21-Jul	7:49 PM	9.129	87.957	ZOOPLANKTON NET RECOVERED	22-Jul	1:48
1037	21-Jul	7:55 PM	9.128	87.959	ZOOPLANKTON NET DEPLOYED	22-Jul	1:54
1038	21-Jul	8:09 PM	9.124	87.962	ZOOPLANKTON NET RECOVERED	22-Jul	2:09
1039	21-Jul	8:20 PM	9.120	87.964	ZOOPLANKTON NET DEPLOYED	22-Jul	2:19
1040	21-Jul	8:46 PM	9.111	87.970	ZOOPLANKTON NET RECOVERED	22-Jul	2:45
1041	21-Jul	8:46 PM	9.111	87.970	ZOOPLANKTON NET DEPLOYED	22-Jul	2:45
1042	21-Jul	9:01 PM	9.105	87.972	ZOOPLANKTON NET RECOVERED	22-Jul	3:01
1043	21-Jul	9:11 PM	9.102	87.973	ZOOPLANKTON NET DEPLOYED	22-Jul	3:11
1044	21-Jul	9:27 PM	9.097	87.975	ZOOPLANKTON NET RECOVERED	22-Jul	3:26
1045	21-Jul	11:36 PM	9.143	87.910	PHYTO NET DEPLOYED	22-Jul	5:36
1046	21-Jul	11:57 PM	9.138	87.912	PHYTO NET RECOVERED	22-Jul	5:57
1047	22-Jul	1:57 AM	9.151	87.889	CTD DEPLOYED	22-Jul	7:56
1048	22-Jul	2:11 AM	9.151	87.888	CTD AT DEPTH	22-Jul	8:10
1049	22-Jul	2:32 AM	9.149	87.890	CTD RECOVERED	22-Jul	8:31
1050	22-Jul	4:18 AM	9.165	87.877	DRIFTER RECOVERED	22-Jul	10:17
1051	22-Jul	4:31 AM	9.164	87.875	DRIFTER DEPLOYED	22-Jul	10:31
1052	22-Jul	6:31 AM	9.169	87.864	CTD DEPLOYED	22-Jul	12:31
1053	22-Jul	6:32 AM	9.169	87.864	CTD AT DEPTH	22-Jul	12:31
1054	22-Jul	6:55 AM	9.171	87.862	CTD RECOVERED	22-Jul	12:55
1055	22-Jul	9:07 AM	9.175	87.847	MOCNESS DEPLOYED	22-Jul	15:07
1056	22-Jul	11:42 AM	9.122	87.909	MOCNESS RECOVERED	22-Jul	17:41
1057	22-Jul	1:11 PM	9.203	87.804	TRACE METAL DEPLOYED	22-Jul	19:10
1058	22-Jul	1:23 PM	9.203	87.803	TRACE METAL AT DEPTH	22-Jul	19:22
1059	22-Jul	1:28 PM	9.203	87.802	TRACE METAL RECOVERED	22-Jul	19:27
1060	22-Jul	1:43 PM	9.203	87.799	ZOOPLANKTON NET DEPLOYED	22-Jul	19:43
1061	22-Jul	1:59 PM	9.200	87.796	ZOOPLANKTON NET RECOVERED	22-Jul	19:58
1062	22-Jul	4:50 PM	9.225	87.779	CTD DEPLOYED	22-Jul	22:50
1063	22-Jul	5:05 PM	9.226	87.778	CTD AT DEPTH	22-Jul	23:04
1064	22-Jul	5:37 PM	9.227	87.776	CTD RECOVERED	22-Jul	23:36
1065	22-Jul	6:59 PM	9.238	87.768	CTD DEPLOYED	23-Jul	0:59
1066	22-Jul	7:19 PM	9.240	87.767	CTD RECOVERED	23-Jul	1:19
1067	22-Jul	7:25 PM	9.241	87.766	ZOOPLANKTON NET DEPLOYED	23-Jul	1:25
1068	22-Jul	7:48 PM	9.237	87.766	ZOOPLANKTON NET RECOVERED	23-Jul	1:47
1069	22-Jul	7:56 PM	9.236	87.765	ZOOPLANKTON NET DEPLOYED	23-Jul	1:56
1070	22-Jul	8:14 PM	9.236	87.762	ZOOPLANKTON NET RECOVERED	23-Jul	2:14
1071	22-Jul	8:20 PM	9.235	87.761	ZOOPLANKTON NET DEPLOYED	23-Jul	2:20

1072	22-Jul	8:40 PM	9.234	87.758	ZOOPLANKTON NET RECOVERED	23-Jul	2:39
1073	22-Jul	9:32 PM	9.262	87.746	ZOOPLANKTON NET DEPLOYED	23-Jul	3:31
1074	22-Jul	10:08 PM	9.261	87.739	ZOOPLANKTON NET RECOVERED	23-Jul	4:08
1075	22-Jul	10:09 PM	9.261	87.740	MOCNESS DEPLOYED	23-Jul	4:08
1076	23-Jul	12:44 AM	9.208	87.778	MOCNESS RECOVERED	23-Jul	6:43
1077	23-Jul	1:59 AM	9.309	87.707	CTD DEPLOYED	23-Jul	7:59
1078	23-Jul	2:14 AM	9.310	87.705	CTD AT DEPTH	23-Jul	8:14
1079	23-Jul	2:36 AM	9.310	87.703	CTD RECOVERED	23-Jul	8:36
1080	23-Jul	4:18 AM	9.325	87.694	DRIFTER RECOVERED	23-Jul	10:17
1081	23-Jul	4:27 AM	9.327	87.691	DRIFTER DEPLOYED	23-Jul	10:27
1082	23-Jul	4:54 AM	9.330	87.682	DRIFTER RECOVERED	23-Jul	10:54
1083	23-Jul	4:54 AM	9.330	87.682	DRIFTER DEPLOYED	23-Jul	10:54
1084	23-Jul	5:51 AM	9.340	87.669	CTD DEPLOYED	23-Jul	11:50
1085	23-Jul	6:51 AM	9.351	87.660	CTD AT DEPTH	23-Jul	12:50
1086	23-Jul	8:31 AM	9.356	87.658	CTD RECOVERED	23-Jul	14:31
1087	23-Jul	10:35 AM	9.402	87.618	ZOOPLANKTON NET DEPLOYED	23-Jul	16:35
1088	23-Jul	10:45 AM	9.400	87.616	ZOOPLANKTON NET RECOVERED	23-Jul	16:45
1089	23-Jul	10:56 AM	9.399	87.614	ZOOPLANKTON NET DEPLOYED	23-Jul	16:56
1090	23-Jul	11:11 AM	9.397	87.610	ZOOPLANKTON NET RECOVERED	23-Jul	17:11
1091	23-Jul	11:19 AM	9.398	87.608	ZOOPLANKTON NET DEPLOYED	23-Jul	17:18
1091	23-Jul	11:19 AM	9.398	87.608	PHYTO NET DEPLOYED	23-Jul	17:19
1092	23-Jul	1:42 PM	9.408	87.581	PHYTO NET RECOVERED	23-Jul	19:42
1093	23-Jul	3:00 PM	9.443	87.570	ZOOPLANKTON NET DEPLOYED	23-Jul	21:00
1094	23-Jul	3:11 PM	9.441	87.566	ZOOPLANKTON NET RECOVERED	23-Jul	21:11
1095	23-Jul	3:28 PM	9.443	87.562	THORIUM PUMP DEPLOYED	23-Jul	21:28
1096	23-Jul	3:34 PM	9.443	87.561	THORIUM PUMP AT DEPTH	23-Jul	21:34
1097	23-Jul	3:42 PM	9.444	87.559	THORIUM PUMP RECOVERED	23-Jul	21:42
1098	23-Jul	3:42 PM	9.444	87.559	CTD DEPLOYED	23-Jul	21:42
1099	23-Jul	3:51 PM	9.445	87.558	CTD AT DEPTH	23-Jul	21:51
1100	23-Jul	4:15 PM	9.445	87.554	CTD RECOVERED	23-Jul	22:14
1101	23-Jul	5:32 PM	9.465	87.542	THORIUM PUMP DEPLOYED	23-Jul	23:32
1102	23-Jul	5:42 PM	9.465	87.540	THORIUM PUMP AT DEPTH	23-Jul	23:42
1103	23-Jul	7:02 PM	9.465	87.536	THORIUM PUMP RECOVERED	24-Jul	1:01
1104	23-Jul	8:51 PM	9.430	87.574	SEDTRAP RECOVERED	24-Jul	2:51
1105	23-Jul	10:12 PM	9.506	87.483	ZOOPLANKTON NET DEPLOYED	24-Jul	4:12
1106	23-Jul	10:25 PM	9.505	87.480	ZOOPLANKTON NET RECOVERED	24-Jul	4:25
1106	23-Jul	10:25 PM	9.505	87.480	ZOOPLANKTON NET RECOVERED	24-Jul	4:25
1107	23-Jul	10:31 PM	9.505	87.479	ZOOPLANKTON NET DEPLOYED	24-Jul	4:31
1108	23-Jul	10:58 PM	9.501	87.476	ZOOPLANKTON NET RECOVERED	24-Jul	4:58
1109	23-Jul	11:02 PM	9.500	87.476	ZOOPLANKTON NET DEPLOYED	24-Jul	5:02
1110	23-Jul	11:22 PM	9.497	87.473	ZOOPLANKTON NET RECOVERED	24-Jul	5:22
1111	24-Jul	1:27 AM	9.533	87.433	CTD DEPLOYED	24-Jul	7:26
1112	24-Jul	1:40 AM	9.533	87.432	CTD AT DEPTH	24-Jul	7:40
1113	24-Jul	1:59 AM	9.533	87.429	CTD RECOVERED	24-Jul	7:59
1114	24-Jul	3:42 AM	9.538	87.411	DRIFTER RECOVERED	24-Jul	9:41
1115	24-Jul	4:51 AM	9.489	87.394	STATION DEPARTURE	24-Jul	10:50