

CRUISE REPORT

S-215

SCIENTIFIC ACTIVITIES UNDERTAKEN ABOARD THE

SSV Robert C. Seamans

Tahiti, French Polynesia – Nuku Hiva, Marquesas, French Polynesia– Oahu, HI, USA

13 February – 21 March 2008



SEA sails its millionth nautical mile aboard S-215. Photo courtesy of J. Morton.

Sea Education Association
Woods Hole, Massachusetts

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Ship's Complement for SSV *Robert C. Seamans S-215*

Scientific Staff

Gary Jaroslow	Chief Scientist
Lynn Asbeck	First Assistant Scientist
Patrick Curran	Second Assistant Scientist
Elizabeth Burakowski	Third Assistant Scientist

Nautical Staff

Chris McGuire	Captain
John "Jack" Morton	Chief Mate
Chris Duda	Second Mate
Juliette White	Third Mate
AJ Johnson	Engineer
Heidi Miller	Assistant Engineer
Tia Leo	Steward

Students

Krystle Anderson	University of Arizona
Chelsea Apito	Roger Williams University
Sphia Bahlkow	Northeastern University
Michelle Belfield	Maryland Institute College of Art
Laura Bramley	Carleton College
Riley Burch	Cerro Cosco Community College
Megan Cook	Oregon State University
Meghan Couet	Loyola College
Laura Duffy	College of Charleston
Alexandra Fioretti	Connecticut College
Alexandra Fitzgerald	State University of NY, Maritime College
Julia Haines	University of Chicago
Alan Han	Dartmouth College
Emily Hewitt	Wellesley College
Elizabeth Koch	Carleton College
Thomas Neilson	Colorado College
Daniel Saxe	Brandeis University

Data Description

This cruise report provides a record of data collected aboard the SSV *Robert C. Seamans* during Cruise S-215 during February – March of 2008. The cruise track transected the central Pacific Ocean from Tahiti, French Polynesia to Oahu, HI with a port stop at Nuku Hiva, French Polynesia (Fig. 1). The sea-going program is an extension of Sea Education Association (SEA) courses conducted for six weeks on shore in Woods Hole and emphasizes the application of theoretical concepts to the study of the oceans. Oceanographic research conducted during Cruise S-215 involved extensive data collection for individual student projects (Table 1) and ongoing SEA research programs. The student projects focused on current scientific problems in physical, chemical, biological, geological, and environmental oceanography, and stressed the interdisciplinary nature of the applied science. In particular, the complex interaction of oceanic processes was emphasized by interdisciplinary, regional, and temporal comparative analyses of the various data sets collected. Student research papers are available on request from SEA.

Permission to conduct oceanographic research within the territorial jurisdiction of the French Polynesia was most kindly granted by the Ministère des Affaires Etrangères et Européennes under Diplomatic Note No.:155/AME.

During the cruise, samples or data were collected at 200 discrete oceanographic stations (Tables 2 and 3) in addition to continuously sampling water depth, sub-bottom acoustic profiling, Acoustic Doppler Current Profiles (ADCP) and flow-through sea surface temperature, salinity and *in-vivo* fluorescence. This report summarizes sea surface chemical properties (Table 3), subsurface physical, chemical and biological characteristics (Fig. 2, Tables 4 and 5), and surface sediment qualities (Table 6). Lengthy CTD, CHIRP, ADCP and flow-through data are not reported here. All unpublished data can be made available by arrangement with the SEA archivist (Contact information, p.2). The information contained in this report is not intended to represent final interpretation of the data and should not be excerpted or cited without written permission from SEA.

Gary E. Jaroslow
Chief Scientist
S-215

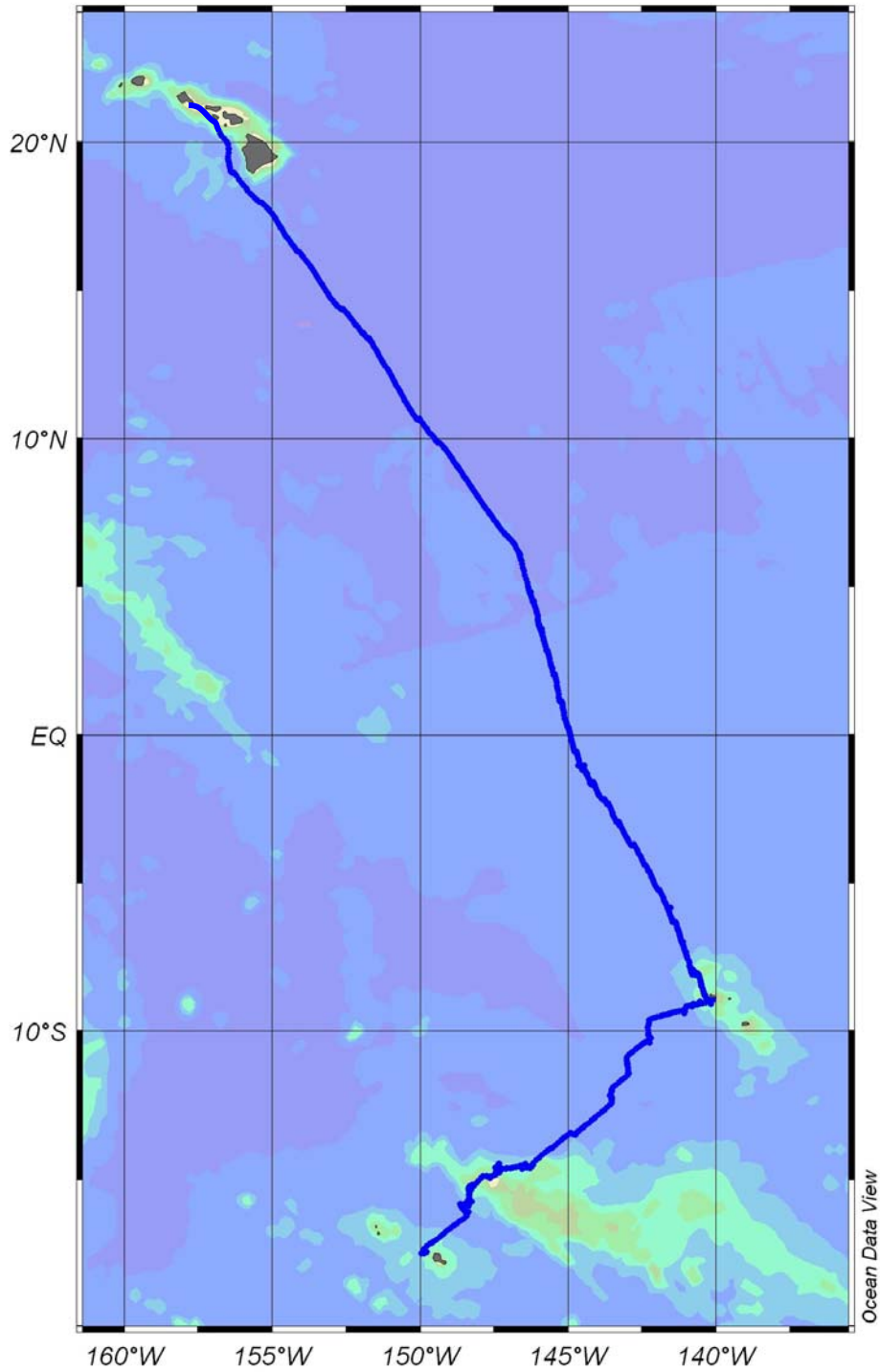


Figure 1. Cruise-track map for Cruise S-215 of the SSV *Robert C. Seamans* from February 13 – March 21, 2008. The cruise began in Tahiti, French Polynesia (FP) with a port stop at Nuku Hiva, Marquesas, FP, and ended in Honolulu, HI, USA.

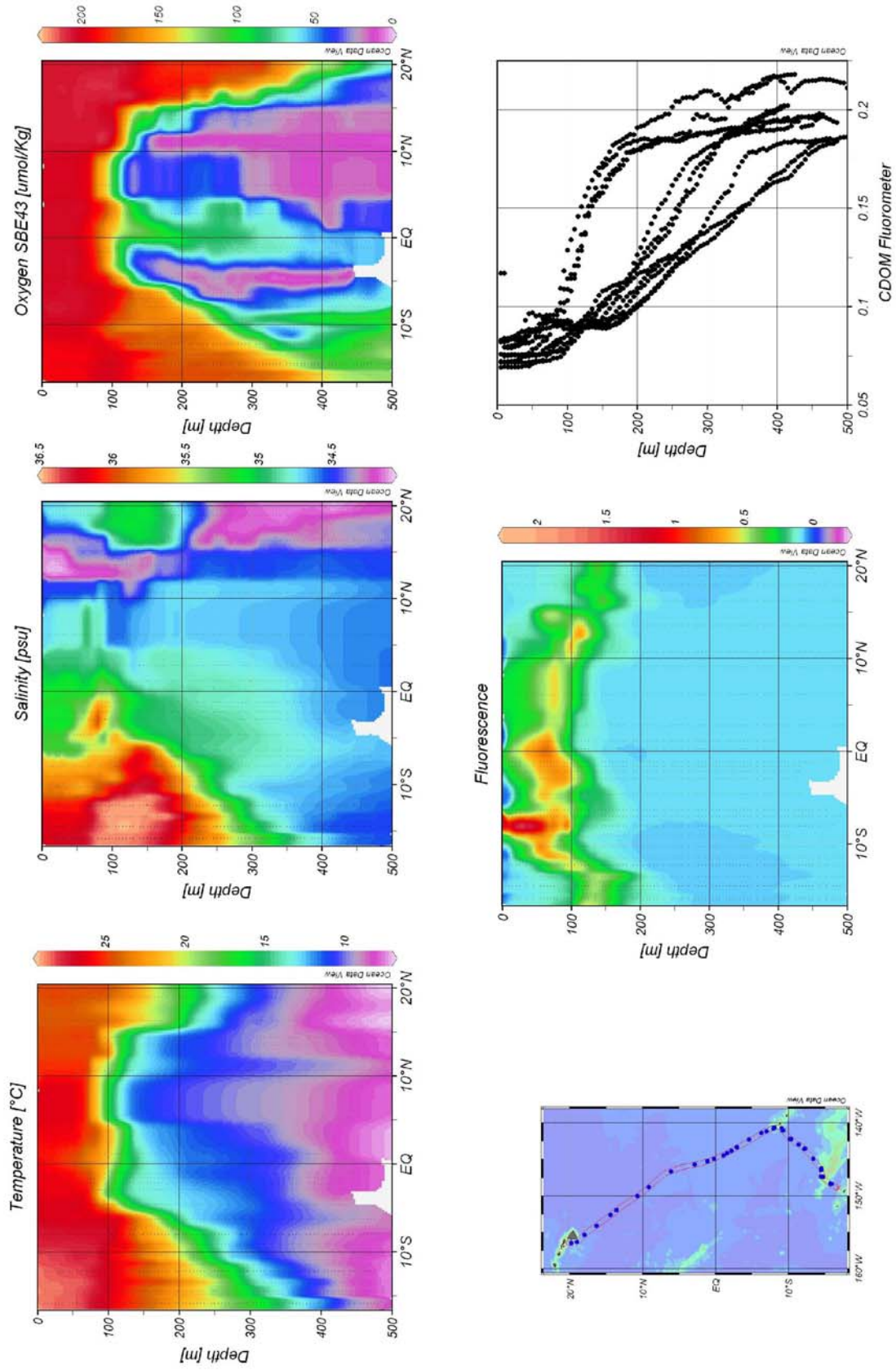


Figure 2. Data collected at CTD and surface stations located in map (lower left, stations shown by blue dots). Along-track hydrographic sections of water temperature, salinity, oxygen and *in-vivo* relative fluorescence (top and middle sections). Plot of water-column profiles of Colored Dissolved Organic Material (CDOM; lower right).

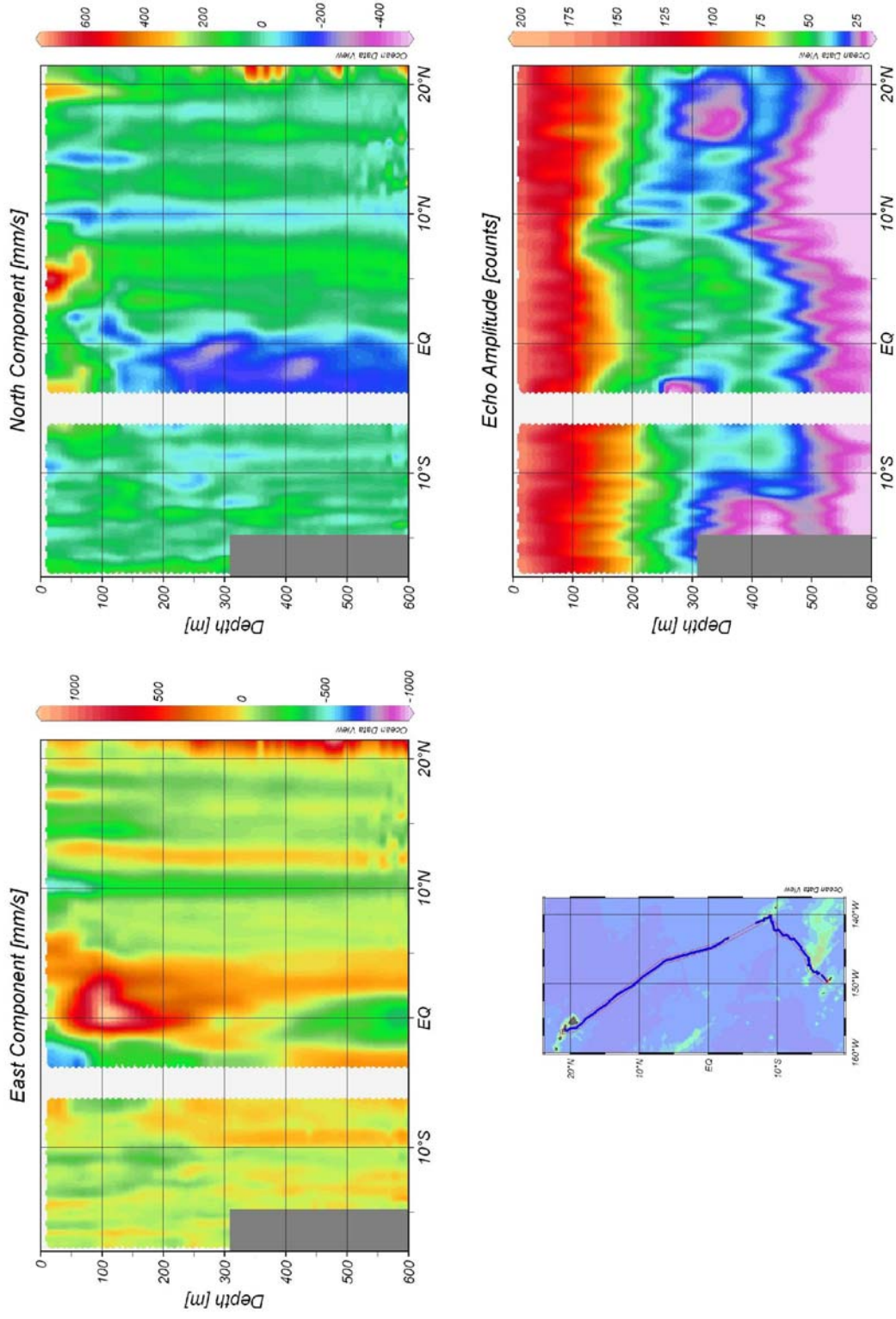


Figure 3. Acoustic Doppler Current Profiler data continuously collected along cruise track (blue line) located in map (lower left). East and North components of current speed along-track sections (top sections). Echo intensity amplitude along-track section (lower right).

Table 1. Student Research Projects

Title	Student Researcher(s)
Variability in the Island Mass Effect as influenced by nutrient availability and surrounding reef topography	Alan Han Julia Haines
The dissolution of calcium carbonate due to ocean acidification	Ali Fioretti
Island Mass Effect: eddies and secondary currents	Alexandra Fitzgerald
The relationship between bioluminescence and chlorophyll- <i>a</i> distribution in the Equatorial Pacific	Chelsea Apito
Diel vertical migration of zooplankton and its effects on myctophid population	Michelle Belfield Riley Burch
Bioluminescence and zooplankton abundance in the central Pacific	Laura Bramley
Biophysical effects on the Deep Chlorophyll Maximum (DCM) in the central Pacific	Laura Duffy
Zooplankton diversity, abundance and horizontal boundaries in the equatorial Pacific Ocean	Daniel Saxe
Influence of Island-Mass Effect on zooplankton density and diversity in the South Pacific Ocean	Emily Hewitt
Expectation of tuna distribution in the central Pacific based on environmental parameters	Elizabeth Koch
Distribution of <i>Velella velella</i> and <i>Physalia physalis</i> in the central Pacific	Krystle Anderson
Heterotrophic bacterial abundance and the oxygen minimum zone of the equatorial Eastern Pacific Ocean as influenced by nutrient and oxygen abundance	Megan Cook
Effects of relative carbonate levels and grain size on submarine sedimentary slopes at island margins in the central Pacific	Thomas Neilson
Horizontal distribution patterns of myctophid fish in the central Pacific during a La Niña year	Sophia Bahlkow Meghan Couet

Table 2: Oceanographic sampling stations

Station	Date	Local Time	Log (nm)	Latitude	Longitude (W)	Sampling Depth (m)	General Locale
CTD Casts							
S215-007-CTD	15-Feb-08	2036	199.5	15°51.0' S	148°19.9'	495	5.5 km W of Makatea
S215-008-CTD	16-Feb-08	0850	237.6	15°47.0' S	148°18.7'	495	6.3 km NW of Makatea
S215-013-CTD	17-Feb-08	2137	402.1	14°46.2' S	147°23.1'	470	NE of Rangiroa
S215-015-CTD	18-Feb-08	0733	435.9	14°29.1' S	147°20.0'	495	100 km W of Ahe
S215-018-CTD	19-Feb-08	0040	523.9	14°28.9' S	146°25.7'	495	5.6 km W of Ahe
S215-020-CTD	19-Feb-08	1343	568.1	14°32.9' S	146°13.4'	500	5.6 km SE of Ahe
S215-023-CTD	20-Feb-08	0912	684.3	13°27.0' S	144°53.7'	495	NE of Ahe
S215-027-CTD	21-Feb-08	1017	811.6	12°18.1' S	143°31.1'	500	S Pac Subtropical Gyre
S215-029-CTD	21-Feb-08	1621	824.7	12°11.1' S	143°33.0'	475	S Pac Subtropical Gyre
S215-031-CTD	22-Feb-08	0845	898.5	11°23.9' S	142°56.8'	555	417 km SW of Nuku Hiva
S215-035-CTD	23-Feb-08	0900	1024.6	10°12.3' S	142°12.9'	485	185 km SW of Nuku Hiva
S215-038-CTD	24-Feb-08	0935	1151.7	9°16.6' S	141°02.2'	525	Hiva
S215-041-CTD	24-Feb-08	2100	1198.9	9°05.8' S	141°02.2'	525	93 km SW of Nuku Hiva
S215-047-CTD	24-Feb-08	2100	1198.9	9°05.8' S	140°45.0'	425	59 km SW of Nuku Hiva
S215-049-CTD	29-Feb-08	1506	1417.4	8°03.9' S	140°39.2'	465	9 km W of Eiao
S215-049-CTD	29-Feb-08	2356	1444.8	7°58.4' S	140°45.7'	485	4.6 km NW of Eiao
S215-053-CTD	1-Mar-08	2100	1530.1	6°59.3' S	141°08.1'	495	120 km NW of Eiao
S215-056-CTD	2-Mar-08	0836	1575.7	6°18.2' S	141°22.3'	480	S Equat. Current
S215-059-CTD	3-Mar-08	0910	1685.9	4°37.0' S	142°15.3'	440	S Equat. Current
S215-064-CTD	4-Mar-08	0835	1793.0	2°56.5' S	143°18.7'	430	S Equat. Current
S215-066-CTD	4-Mar-08	2139	1841.5	2°11.4' S	143°49.6'	435	S Equat. Current
S215-068-CTD	5-Mar-08	0812	1880.7	1°36.5' S	144°08.5'	435	S Equat. Current
S215-071-CTD	5-Mar-08	2007	1923.9	1°07.9' S	144°28.1'	480	Equat. Undercurrent
S215-074-CTD	6-Mar-08	2030	2021.7	0°13.8' N	144°54.9'	395	Equat. Undercurrent
S215-076-CTD	7-Mar-08	0836	2079.3	1°08.0' N	145°13.5'	400	Equat. Undercurrent
S215-080-CTD	8-Mar-08	0826	2190.7	2°49.1' N	145°42.2'	550	N Equat. Countercurrent
S215-085-CTD	10-Mar-08	0819	2381.3	6°06.8' N	146°38.6'	500	N Equat. Countercurrent
S215-088-CTD	12-Mar-08	0820	2594.7	9°06.3' N	148°46.0'	495	N Equat. Current
S215-091-CTD	13-Mar-08	0810	2705.2	10°39.6' N	150°01.8'	4400	N Equat. Current
S215-092-CTD	14-Mar-08	2010	2896.6	13°33.3' N	151°55.0'	5719	N Equat. Current
S215-094-CTD	15-Mar-08	0826	2960.6	14°21.6' N	152°37.3'	3675	N Equat. Current
S215-095-CTD	16-Mar-08	0816	3085.9	16°17.8' N	154°05.9'	3655	N Equat. Current
S215-097-CTD	17-Mar-08	0820	3194.9	17°57.2' N	155°21.5'	890	65 nm SW of Hawaii
S215-098-CTD	17-Mar-06	2117	3261.0	18°57.3' N	156°17.5'	355	44 km SW of Hawaii
S215-099-CTD	18-Mar-08	0813	4727.0	19°45.2' N	156°28.1'	500	42 km W of Hawaii
Hydrocasts							
S215-007-HC	15-Feb-08	2145	200.8	15°50.7' S	148°20.8'	248	5.5 km W of Makatea
S215-008-HC	16-Feb-08	1015	239.3	15°47.7' S	148°20.1'	490	6.3 km NW of Makatea
S215-018-HC	19-Feb-08	0139	525.0	14°29.3' S	146°26.0'	275	5.6 km W of Ahe
S215-020-HC	19-Feb-08	1554	569.9	14°32.7' S	146°14.3'	505	5.6 km SE of Ahe
S215-029-HC	21-Feb-08	1745	825.8	12°12.0' S	143°34.3'	480	S Pac. Subtropical Gyre
S215-035-HC	23-Feb-08	1023	1025.8	10°13.8' S	142°13.7'	455	185 km SW of Nuku

							Hiva
S215-047-HC	29-Feb-08	1610	1419.7	8°03.2' S	140°38.4'	465	8 km SE of Eiao
S215-049-HC	1-Mar-08	0050	1445.1	7°58.9' S	140°46.2'	490	4.6 km NW of Eiao
S215-064-HC	4-Mar-08	0947	1793.4	2°56.3' S	143°21.0'	430	S Equat. Current
S215-076-HC	7-Mar-08	0945	2079.3	1°07.9' N	145°15.4'	415	S Equat. Current
S215-080-HC	8-Mar-08	0935	2192.0	2°49.1' N	145°42.2'	525	N Equat. Countercurrent

Bathypotometer Casts

S215-013-BP	17-Feb-08	2106	402.1	14°45.8' S	147°22.5'	100	NE Rangiroa
S215-025-BP	20-Feb-08	2025	723.7	13°16.7' S	144°30.9'	100	NE of Ahe
S215-041-BP	24-Feb-08	2021	1198.5	9°05.3' S	140°44.3'	100	59 km SW of Nuku Hiva
S215-053-BP	1-Mar-08	2024	1529.3	6°59.2' S	141°07.6'	100	120 km N of Eiao
S215-061-BP	3-Mar-08	2004	1741.4	3°41.7' S	142°46.9'	100	S Equat. Current
S215-066-BP	4-Mar-08	2045	1841.5	2°11.0' S	143°47.5'	100	S Equat. Current
S215-071-BP	5-Mar-08	2058	1924.0	1°08.4' S	144°29.2'	100	Equat. Undercurrent
S215-077-BP	7-Mar-08	2038	2133.5	2°03.1' N	145°26.9'	100	Equat. Undercurrent
S215-081-BP	8-Mar-08	2035	2234.9	3°34.5' N	145°53.9'	100	N Equat. Countercurrent

CalCOFI Nets*

S215-005-CN	15-Feb-08	0854	154.5	16°09.6' S	148°26.2'	3	24 km SW of Makatea
S215-006-CN	15-Feb-08	1621	176.8	15°55.9' S	148°35.7'	3	33 km W of Makatea
S215-008-CN	16-Feb-08	1133	241.7	15°47.5' S	148°20.8'	3	7 km N of Makatea
S215-017-CN	18-Feb-08	2011	492.4	14°37.3' S	146°55.8'	3	56 km W of Ahe
S215-019-CN	19-Feb-08	1215	562.7	14°36.5' S	146°16.1'	3	19 km SE of Ahe
S215-021-CN	19-Feb-08	1807	581.0	14°31.1' S	146°10.4'	3	2 km SE of Ahe
						3	278 km SW of Nuku Hiva
S215-033-CN	22-Feb-08	2020	947.6	10°53.1' S	143°00.4'		Hiva
S215-040-CN	24-Feb-08	1608	1175.3	9°13.0' S	141°01.6'	3	93 km SW of Nuku Hiva
S215-046-CN	29-Feb-08	1230	1410.5	8°07.6' S	140°34.4'	3	SE of Eiao
S215-048-CN	29-Feb-08	1831	1427.2	8°05.5' S	140°43.6'	3	6 km S of Eiao
S215-050-CN	1-Mar-08	0458	1461.7	8°01.6' S	140°49.6'	3	12 km SW of Eiao
S215-051-CN	1-Mar-08	0755	1475.6	7°47.9' S	140°53.4'	3	28km NW of Eiao

* CN = 500- μ m-mesh, 0.5 m diameter net

Neuston Nets

S215-004-NT	15-Feb-08	0057	103.4	16°42.7' S	149°02.8'	0	SW Makatea
S215-009-NT	17-Feb-08	0117	306.6	15°17.5' S	148°16.7'	0	SW Rangiroa
S215-016-NT	18-Feb-08	1209	452.6	14°42.3' S	147°19.0'	0	100 km SW of Ahe
S215-022-NT	20-Feb-08	0102	630.1	13°58.1' S	145°35.4'	0	NE of Manihi
S215-026-NT	21-Feb-08	0102	754.0	12°57.3' S	144°07.1'	0	S Pac. Subtropical Gyre
S215-028-NT	21-Feb-08	1100	812.2	12°18.5' S	143°31.4'	0	S Pac. Subtropical Gyre
S215-030-NT	22-Feb-08	0103	849.9	11°53.4' S	143°28.5'	0	S Pac. Subtropical Gyre
						0	278 km SW of Nuku Hiva
S215-034-NT	23-Feb-08	0120	979.5	10°33.5' S	142°40.3'	0	Hiva
S215-037-NT	24-Feb-07	0057	1101.0	9°28.7' S	141°48.6'	0	SW of Nuku Hiva
						0	111 km SW of Nuku Hiva
S215-039-NT	24-Feb-08	1223	1158.3	9°21.9' S	141°03.9'	0	Hiva
S215-045-NT	29-Feb-08	0135	1363.3	8°47.9' S	140°21.8'	0	9 km W of Nuku Hiva
S215-052-NT	1-Mar-08	1215	1496.2	7°28.8' S	140°58.7'	0	61 km NW of Eiao
S215-055-NT	2-Mar-08	0404	1556.9	6°36.0' S	141°16.0'	0	S Subtropical Gyre
S215-058-NT	3-Mar-08	0145	1645.7	5°14.1' S	141°56.1'	0	S Equat. Current
S215-060-NT	3-Mar-08	1201	1698.1	4°24.4' S	142°22.6'	0	S Equat. Current

S215-063-NT	4-Mar-08	0107	1760.6	3°29.7' S	142°59.5'	0	S Equat. Current
S215-065-NT	4-Mar-08	1714	1828.6	2°19.2' S	143°39.1'	0	S Equat. Current
S215-067-NT	5-Mar-08	0055	1852.5	2°02.0' S	143°56.3'	0	S Equat. Current
S215-070-NT	5-Mar-08	1635	1913.2	1°16.1' S	144°23.2'	0	S Equat. Current
S215-073-NT	6-Mar-08	0106	1938.0	1°02.5' S	144°34.2'	0	Equat. Undercurrent
S215-074-NT	7-Mar-08	0046	2040.6	0°31.4' S	145°05.0'	0	Equat. Undercurrent
S215-079-NT	8-Mar-08	0143	2156.2	2°16.9' N	145°32.8'	0	Equat. Undercurrent
S215-082-NT	9-Mar-08	0146	2251.8	3°42.6' N	145°58.5'	0	N Equat. Countercurrent
S215-083-NT	9-Mar-08	1415	2295.5	4°30.4' N	146°10.0'	0	N Equat. Countercurrent
S215-084-NT	9-Mar-08	2008	2311.1	4°47.1' N	146°17.3'	0	N Equat. Countercurrent
S215-087-NT	10-Mar-08	2008	2426.6	6°38.1' N	146°59.9'	0	N Equat. Current
S215-090-NT	13-Mar-08	0100	2669.7	10°09.4' N	149°32.2'	0	N Equat. Current
S215-093-NT	15-Mar-08	0052	2919.1	13°49.8' N	152°09.6'	0	N Equat. Current
S215-096-NT	16-Mar-08	1953	3136.4	17°06.9' N	154°41.9'	0	N Equat. Current

Sediment Samples*

S215-001-SG	14-Feb-08	1338	27.1	17°29.3' S	149°51.6'	20	Opunohu Bay, Moorea, bay
S215-002-SG	14-Feb-08	1430	28.4	17°28.8' S	149°51.9'	67	Opunohu Bay, Moorea, reef
S215-003-SG	14-Feb-08	1545	36.0	14°58.4' S	147°38.3'	329	Opunohu Bay, Moorea, slope
S215-010-SG	17-Feb-08	1607	373.0	14°57.7' S	147°57.5'	21	Rangiroa, lagoon
S215-011-SG	17-Feb-08	1653	377.0	8°56.7' S	140°09.9'	383	Rangiroa, slope
S215-042-SG	28-Feb-08	1506	1328.3	8°58.5' S	140°09.2'	8	Hakatea Bay, Nuku Hiva, bay
S215-043-SG	28-Feb-08	1840	1331.8	9°01.1' S	140°09.5'	75	Hakatea Bay, Nuku Hiva, slope
S215-044-SG	28-Feb-08	1918	1334.4	17°30.7' S	149°51.2'	557	Hakatea Bay, Nuku Hiva, slope
S215-100-SG	19-Mar-08	1850	3416.5	21°07.2' N	157°20.2'	27	SW Molokai, shelf

*SG=Shipek Grab

Phytoplankton Samples*

S215-012-PN	17-Feb-08	1854	389.2	14°51.7' S	147°28.1'	0	E of Rangiroa
S215-041-PN	24-Feb-08	2048	1198.9	9°05.7' S	140°44.9'	0	59 km SW of Nuku Hiva
S215-053-PN	1-Mar-08	2110	1530.1	6°59.3' S	141°08.1'	0	S. Subtropical Gyre
S215-066-PN	4-Mar-08	1900	1836.6	2°11.0' S	143°47.5'	0	S Equat. Current
S215-071-PN	5-Mar-08	1955	1923.9	1°07.8' S	144°27.8'	0	S Equat. Current
S215-078-PN	7-Mar-08	2132	2134.5	2°02.5' N	145°27.5'	0	Equat. Undercurrent
S215-081-PM	8-Mar-08	1949	2234.2	3°33.6' N	145°53.7'	0	N Equat. Countercurrent

*sampled underway using filtered flow-through system

Tucker Trawl

S215-014A-TT	17-Feb-08	2252	402.1	14°47.9' S	147°24.6'	70-100	NE of Rangiroa
S215-014B-TT	17-Feb-08	2252	402.1	14°48.1' S	147°24.7'	0-60	NE of Rangiroa
S215-014C-TT	17-Feb-08	2252	402.1	14°49.5' S	147°25.3'	misfire	NE of Rangiroa
S215-024A-TT	20-Feb-08	1018	686.1	13°22.4' S	144°53.3'	0-455	80 nm NE of Ahe
S215-024B-TT	20-Feb-08	1018	686.1	13°22.4' S	144°53.3'	455	80 nm NE of Ahe
S215-024C-TT	20-Feb-08	1018	686.1	13°22.4' S	144°53.3'	275-455	80 nm NE of Ahe
S215-032A-TT	22-Feb-08	1025	900.9	11°25.7' S	142°58.2'	0-400	417 km SW of Nuku Hiva
S215-032B-TT	22-Feb-08	1052	902.1	11°25.7' S	142°58.2'	200-400	417 km SW of Nuku Hiva

										Hiva
										417 km SW of Nuku
S215-032C-TT	22-Feb-08	1137	903.9	11°25.7' S	142°58.2'	0-200				Hiva
S215-041A-TT	24-Feb-08	2154	1200.3	9°07.6' S	140°46.7'	0-100				59 km SW of Nuku Hiva
S215-041B-TT	24-Feb-08	2208	1201.4	9°07.6' S	140°46.7'	75-100				59 km SW of Nuku Hiva
S215-041C-TT	24-Feb-08	2244	1012.5	9°07.6' S	140°46.7'	25-50				59 km SW of Nuku Hiva
S215-054A-TT	1-Mar-08	0000	1530.1	6°59.6' S	141°08.5'	70-100				S Equat. Current
S215-054B-TT	1-Mar-08	2153	1530.5	6°59.6' S	141°08.5'	60-70				S Equat. Current
S215-054C-TT	1-Mar-08	2223	1531.5	6°59.6' S	141°08.5'	0-60				S Equat. Current
S215-057A-TT	2-Mar-08	0948	1577.1	6°18.7' S	141°24.0'	0-200				S Equat. Current
S215-057B-TT	2-Mar-08	1001	1577.6	6°18.7' S	141°24.0'	200-230				S Equat. Current
S215-057C-TT	2-Mar-08	1040	1578.7	6°18.7' S	141°24.0'	350-400				S Equat. Current
S215-062A-TT	3-Mar-08	2057	1743.0	3°42.9' S	142°48.8'	0-100				S Equat. Current
S215-062B-TT	3-Mar-08	2108	1743.4	3°42.9' S	142°48.8'	70-100				S Equat. Current
S215-062C-TT	3-Mar-08	2152	1743.9	3°42.9' S	142°48.8'	40-65				S Equat. Current
S215-069A-TT	5-Mar-08	0910	1882.0	1°37.7' S	144°09.8'	0-400				S Equat. Current
S215-069B-TT	5-Mar-08	0940	1883.2	1°37.7' S	144°09.8'	250-400				S Equat. Current
S215-069C-TT	5-Mar-08	1015	1884.2	1°37.7' S	144°09.8'	0-170				S Equat. Current
S215-072A-TT	5-Mar-08	2129	1924.9	1°09.1' S	144°29.7'	0-100				Equat. Undercurrent
S215-072B-TT	5-Mar-08	2141	na	1°9.4' S	144°29.8'	50-100				Equat. Undercurrent
S215-072C-TT	5-Mar-08	2241	na	1°10.5' S	144°30.2'	misfire				Equat. Undercurrent
S215-078A-TT	7-Mar-08	2132	2134.5	2°2.5' N	145°27.5'	0-100				Equat. Undercurrent
S215-078B-TT	7-Mar-08	2139	2134.8	2°2.5' N	145°27.5'	80-100				Equat. Undercurrent
S215-078C-TT	7-Mar-08	2214	2136.5	2°2.5' N	145°27.5'	0-80				Equat. Undercurrent
S215-081A-TT	8-Mar-08	2130	na	3°34.4' N	145°54.7'	0-100				N Equat. Countercurrent
S215-081B-TT	8-Mar-08	2147	2237.1	3°34.4' N	145°54.7'	70-100				N Equat. Countercurrent
S215-081C-TT	8-Mar-08	2219	2238.5	3°34.4' N	145°54.7'	0-70				N Equat. Countercurrent
S215-086A-TT	10-Mar-08	0920	2382.6	6°5.8' N	146°38.3'	0-500				N Equat. Countercurrent
S215-086B-TT	10-Mar-08	0947	2383.8	6°5.8' N	146°38.3'	350-500				N Equat. Countercurrent
S215-086C-TT	10-Mar-08	1021	2385.0	6°5.8' N	146°38.3'	0-350				N Equat. Countercurrent

Table 3. Surface station data.*

Station	Date	Time	Log	Latitude	Longitude (W)	Temp (°C)	Salinity (PSU)	PO ₄ (µM)	SiO ₂ (µM)	Chl-a (µg/l)	pH
SS-001	14-Feb-08	0722	23.29	17°30.7' S	149°57.2'	29.0	36.0	0.681	5.193	0.156	8.257
SS-002	14-Feb-08	2020	68.80	17°05.3' S	149°30.1'	29.7	36.1	0.676	2.132	0.027	8.142
SS-003	15-Feb-08	0100	103.40	16°42.7' S	149°02.8'	29.0	36.1	0.689		0.023	8.229
SS-004	15-Feb-08	0442	129.33	16°25.5' S	148°39.5'	28.9	36.0	0.647	3.577	0.032	8.273
SS-005	15-Feb-08	1122	161.80	16°04.2' S	148°29.4'	29.3	36.1	0.596		0.015	8.249
SS-006	15-Feb-08	1903	188.10	15°50.9' S	148°29.7'	29.1	36.1	0.643	1.618	0.020	8.250
SS-007	16-Feb-08	0142	210.6	15°45.4' S	148°21.7'	28.9	36.2	0.584		0.016	8.168
SS-008	16-Feb-08	1303	248.7	15°42.3' S	148°20.7'	29.1	36.1	0.596	3.662	0.017	
SS-009	17-Feb-08	2000	395.2	14°35.7' S	147°22.0'	28.8	36.2	0.706	5.488	0.015	8.204
SS-010	18-Feb-08	0437	424.3	14°35.7' S	147°22.0'	27.1	36.1	0.752	6.249	0.016	8.189
SS-011	18-Feb-08	1223	452.6	14°42.9' S	147°19.1'	29.1	36.1	0.727	3.311	0.016	
SS-012	18-Feb-08	1853	481.0	14°38.7' S	147°06.1'	29.0	36.1	0.668	3.425	0.021	8.229
SS-013	18-Feb-08	2327	514.6	14°32.4' S	146°33.1'	28.9	36.1	0.744	2.379	0.019	8.204
SS-014	19-Feb-08	0620	535.6	14°36.6' S	146°30.7'	28.8	36.1		4.566	0.017	
SS-015	19-Feb-08	0852	549.1	14°34.1' S	146°26.4'	28.8	36.1			0.022	8.179
SS-016	21-Feb-08	0125	756.0	12°57.3' S	144°07.1'	28.7	36.1	0.748	5.897	0.025	8.240

SS-017	21-Feb-08	1107	812.5	12°18.7' S	143°31.3'	28.7	36.0	0.714		0.041	8.180
SS-018	22-Feb-08	0111	850.0	11°53.6' S	143°28.6'	28.6	36.0	0.710	5.032	0.026	8.211
SS-019	22-Feb-08	0740	894.2	11°27.1' S	142°57.3'	28.1	35.8	0.921		0.089	8.214
SS-020	22-Feb-08	2100	949.7	10°51.3' S	142°59.9'	29.1	36.2	0.719	3.720	0.031	8.251
SS-021	23-Feb-08	1058		10°14.1' S	142°13.8'	28.4	35.8	0.702		0.154	8.220
SS-022	23-Feb-08	2040	1076.1	9°36.3' S	142°13.7'	28.4	35.7	0.765	3.919	0.144	8.221
SS-023	24-Feb-08	0330	1115.3	9°25.3' S	141°35.4'	27.9	35.6	0.849		0.193	8.132
SS-024	24-Feb-08	0810	1145.2	9°18.1' S	141°07.2'	27.8	35.70	1.554	4.128	0.221	8.203
SS-025	24-Feb-08	1608	1175.3	9°13.0' S	141°01.6'	28.0	35.70	0.761		0.185	8.195
SS-026	24-Feb-08	2253	1203.0	9°09.5' S	140°48.0'	27.9	35.80	0.799	2.797	0.253	8.221
SS-027	24-Feb-08	0545	1244.2	9°00.5' S	140°13.1'	27.7	35.70	0.879		0.266	
SS-028	28-Feb-08	2200	1345.6	9°01.5' S	140°14.3'	27.6	35.50	1.501	3.124	0.168	8.203
SS-029	29-Feb-08	0348	1370.0	8°45.3' S	140°23.6'	27.2	35.20	1.527	6.124	0.130	8.191
SS-030	29-Feb-08	0924	1397.3	8°20.4' S	140°21.2'	27.5	35.60	1.547	1.887	0.301	8.169
SS-031	29-Feb-08	1610	1419.7	8°03.5' S	140°38.4'	27.6	35.70				8.216
SS-032	29-Feb-08	1905	1428.8	8°04.6' S	140°45.0'	27.7	35.70	0.760	2.577	0.914	8.200
SS-033	29-Feb-08	2213	1440.5	7°54.8' S	140°46.8'	27.5	35.60	0.960	1.598	0.194	8.163
SS-034	1-Mar-08	0510	1461.8	8°01.2' S	140°49.7'	27.4	35.60	0.990		0.085	8.093
SS-035	1-Mar-08	0752	1475.6	7°48.1' S	140°53.4'	27.4	35.50	0.816	2.062	0.135	8.163
SS-036	2-Mar-08	0413	1556.9	6°36.1' S	141°16.1'	26.8	35.20	1.215	3.031	0.061	8.163
SS-037	2-Mar-08	0957	1577.4	6°18.9' S	141°24.3'	26.8	35.20	1.195	2.577	0.065	8.065
SS-038	3-Mar-08	0150	1645.7	5°14.1' S	141°56.1'	27.2	35.30	0.934	2.691	0.053	8.088
SS-039	3-Mar-08	1210	1698.1	4°24.6' S	142°23.5'	27.0	35.20	0.954	3.619	0.061	8.120
SS-040	3-Mar-08	2220	1745.2	3°44.5' S	142°51.4'	26.8	35.10	1.133	3.381	0.048	8.118
SS-041	4-Mar-08	0112	1760.6	3°29.8' S	142°59.7'	26.7	35.10	1.164	3.093	0.058	8.137
SS-042	4-Mar-08	0947	1793.4	2°56.3' S	143°21.6'	26.9	35.20				8.110
SS-043	4-Mar-08	1715	1828.6	2°19.3' S	143°39.2'	26.6	35.10	1.113	1.938	0.034	8.113
SS-044	5-Mar-08	0104	1852.7	2°02.2' S	143°56.5'	26.1	35.00	0.975	2.392		8.129
SS-045	5-Mar-08	0920	1882.0	1°37.9' S	144°10.0'	26.4	35.10	1.108	4.969	0.046	8.117
SS-046	5-Mar-08	1700	1914.0	1°16.8' S	144°23.4'	26.7	35.10	1.563	3.144	0.060	8.038
SS-047	5-Mar-08	2202	1938.0	1°10.0' S	144°30.0'	26.6	35.20	1.067	1.845	0.045	8.187
SS-048	6-Mar-08	0110	1938.0	1°02.5' S	144°34.2'	26.5	35.20	1.159	3.392	0.048	8.160
SS-049	7-Mar-08	0050	2040.6	0°31.4' N	145°05.0'	25.7	35.70	1.205	3.371	0.071	8.129
SS-050	7-Mar-08	1000	2079.8	1°07.9' N	145°15.9'	25.8	35.10				8.155
SS-051	7-Mar-08	2140	2135.0	2°02.3' N	145°27.8'	26.3	34.90	0.954		0.050	8.134
SS-052	8-Mar-08	0145	2156.2	2°16.9' N	145°32.7'	26.2	34.90	0.995	2.928	0.060	8.140
SS-053	8-Mar-08	0925	2191.1	2°49.0' N	145°42.1'	26.3	34.80				8.139

*Blank spaces = data not available.

Table 4: Neuston tow data. Locations given in Table 1.

Station	Tow length (m)	Temp (°C)	Salinity (PSU)	Zoopl. Biomass (ml)	Zoopl. Density (ml/m ²)	Plastic Pieces (#)	Plastic Pellets (#)	Tar (yes/no)	Halobates (#)	Myctophids (#)
S215-004-NT	2148	29.0	36.0	23.0	0.639	4	0	no	0	24
S215-009-NT	1886	28.7	36.1	1.8	0.050	1	0	no	5	2
S215-016-NT	2617	29.0	36.1	1	0.028	4	0	no	27	0
S215-022-NT	2022	28.7	36.0	9	0.250	0	0	no	9	2
S215-026-NT	1945	28.7	36.1	5	0.139	2	0	no	12	7
S215-028-NT	1852	28.8	36.1	2.2	0.061	1	0	no	2	0
S215-030-NT	1818	28.6	36.1	5.7	0.158	0	0	no	2	0
S215-034-NT	2148	28.5	35.8	27.2	0.760	0	0	no	0	1
S215-037-NT	2037	28.0	35.6	224	6.292	0	0	no	2	0
S215-039-NT	2037	27.9	35.7	38	1.064	2	0	no	0	0

S215-045-NT	1888	27.2	35.2	37	1.051	0	0	no	3	2
S215-052-NT	1992	27.3	35.4	13	0.367	0	0	no	0	0
S215-055-NT	1329	26.8	35.2	32	0.909	0	0	no	8	0
S215-058-NT	1852	27.3	35.4	9	0.254	0	0	no	0	4
S215-060-NT	1852	27.1	35.2	6	0.170	0	0	no	1	0
S215-063-NT	1296	26.7	35.1	9	0.256	0	0	no	3	7
S215-065-NT	2777	26.5	35.1	30	0.855	0	0	no	0	0
S215-067-NT	2260	26.4	35.1	30	0.855	0	0	no	4	55
S215-070-NT	1707	26.7	35.1	39	1.111	0	0	no	1	0
S215-073-NT	2593	26.5	35.2	46	1.307	0	0	no	0	55
S215-074-NT	1482	25.7	35.2	14.5	0.412	0	0	no	1	11
S215-079-NT	1335	26.3	34.9	32	0.917	0	0	no	0	13
S215-082-NT	667	26.5	34.7	66	1.902	0	0	no	0	45
S215-083-NT	2704	27.0	34.7	9.5	0.274	0	0	no	1	0
S215-084-NT	3117	26.8	34.7	61	1.758	0	0	no	65	64
S215-087-NT	1333	26.7	34.7	14	0.403	0	0	no	2	18
S215-090-NT	1900	25.7	34.5	40	1.159	0	0	no	1	2
S215-093-NT	1887	24.8	33.9	4	0.118	0	0	no	0	0

Table 5. Hydrocast station data. Locations given in Table 1.*

Station	Bottle (#)	Depth (m)	O ₂ (ml/l)	PO ₄ (μM)	SiO ₂ (μM)	Chl a (μg/l)
S215-007--HC	13	0		0.668	5.764	0.0185
	12	30				
	11	30	4.88	0.698		0.0171
	10	59				
	9	60		0.609	5.317	0.031
	8	89				
	7	90		0.660		0.0401
	6	119				
	5	120	4.35	0.651	5.878	0.1316
	4	159				
	3	159		0.786		0.1073
	2	198				
	1	199	4.21	0.892	2.873	0.022
S215-008--HC	13	0		0.664	6.524	0.0212
	12	25		0.630		0.0272
	11	50		0.685	2.398	0.0311
	10	75		0.609		0.0429
	9	99	4.79	0.617		0.0622
	8	139		0.740	1.808	0.1112
	7	174		0.875		0.0587
	6	199		0.875		0.0335
	5	249	4.35	0.904		0.0133
	4	298		1.018	5.431	0.0104
	3	348		4.385		
2	398		1.773			
1	447	3.13	2.368			
S215-018--HC	13	0		0.588	2.094	0.0195

	12	49				
	11	50	4.56	0.482		0.021
	10	98				
	9	99		0.765	2.265	0.0593
	8	148				
	7	149	4.19	0.714		0.1028
	6	168				
	5	169		0.740	1.685	0.0748
	4	198				
	3	199	4.11	0.765		0.0318
	2	247				
	1	249		0.849	5.279	0.0049
S215-020--HC	13	0		0.579	6.382	0.015
	12	40		0.651		0.028
	11	80		0.600	4.385	0.061
	10	100	4.73	0.588		0.073
	9	124		0.693		0.117
	8	144		0.710	5.250	0.129
	7	164		0.723		0.102
	6	199		0.828		0.031
	5	249	4.37	0.904		0.004
	4	298		1.288	6.562	0.002
	3	348		1.693		
	2	398		2.145		
	1	447	2.71	2.508		
S215-029--HC	13	0		0.748		0.028
	12	25		0.664		0.039
	11	50		0.626		0.095
	10	70		0.668		0.154
	9	79	4.82	0.841		0.151
	8	90		0.714		0.151
	7	99		0.719		0.197
	6	149		0.803		0.043
	5	199		0.913		0.013
	4	249	4.16	1.056		
	3	298		1.537		
	2	347		2.562		
	1	447	2.78	0.706		
S215-035--HC	13	0			5.079	0.124
	12	20		0.706		0.239
	11	35		0.773		0.225
	10	45	4.57	0.750		0.228
	9	55		0.706		0.211
	8	65		0.845		0.213
	7	80				0.072
	6	120		0.984		0.010
	5	175	4.05	1.622		
	4	220		1.069		
	3	275		2.275		
	2	320	1.59	2.643		
	1	450		2.837		
S215-047-HC	13	0		0.735	8.959	

	12	15				
	11	15		0.791		0.318
	10	28	4.71	0.735	7.990	0.684
	9	30				
	8	74				
	7	75		0.837		0.365
	6	148				
	5	149	3.88	0.888	7.124	0.043
	4	198				
	3	199		1.174		0.010
	2	347				
	1	348	1.63	3.014	15.412	
S215-049-HC	13	0		0.811	5.876	0.231
	12	14				
	11	15		0.914		0.221
	10	28				
	9	30		0.914	6.948	0.214
	8	75				
	7	75	4.92	4.895		0.194
	6	104				
	5	105		0.811	5.351	0.133
	4	168				
	3	169	3.78	1.200		0.012
	2	287				
	1	288	1.50	3.030	13.433	
S215-064-HC	13	0	5.81	1.200	4.505	0.061
	12	15		1.195		0.064
	11	30		1.215		0.073
	10	38		1.154		0.071
	9	50		0.980		0.130
	8	70		1.021		0.193
	7	80		1.297		0.183
	6	89		1.665		0.176
	5	100		2.176		0.012
	4	149		2.825		0.134
	3	199	1.23	2.529		
	2	279		3.193		
	1	397	1.42	3.628		
S215-076-HC	13	0		1.021	3.495	0.091
	12	15	4.98	1.098		0.104
	11	30		1.215		0.133
	10	50		1.363		0.159
	9	60		1.220		0.200
	8	65		1.190		0.203
	7	70		1.287		0.224
	6	85		1.307		0.157
	5	Did not fire				
	4	149	2.79	2.171		0.015
	3	199		2.539		
	2	298	1.79	2.815		
	1	Did not fire				
S215-080-HC	13	0		0.842	2.619	0.070

12	25	4.71	0.908	0.097
11	55		0.878	0.107
10	59		0.929	0.165
9	70		0.980	0.173
8	80		3.577	0.200
7	100		1.624	0.073
6	139		1.716	0.011
5	174	1.59	2.473	0.005
4	199		2.687	0.005
3	257		2.483	
2	398	0.94	3.055	
1	496		3.704	

*Blank spaces = no data collected.

Table 6: ARGO Float deployment sites

ARGO Float	Date	GMT Time	Latitude	Longitude (W)
3056	07-Mar-08	0436	0°07.4' N	144°57.7'
3059	08-Mar-08	1653	2°43.9' N	145°39.7'