

TA-16-01-BLFN & DA-16-06-BLFN Trip Report

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To: Distribution

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From: William Thompson

Subject: TAO Field Operations

Cruise Instructions: TA-16-01-BLFN & DA-16-06-BLFN

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Itinerary: Yokohama, Japan – Yokohama, Japan – Apia, Samoa – Apia, Samoa – Tauranga, New Zealand

Cruise Dates: 7/23/2016 – 9/30/2016

Reason for Trip: To assist PMEL with shipboard operations involving the Kuroshio Extension Observatory mooring. As well as service NDBC TAO and DART stations along the 170W meridian and stations 21413, 51425, 51426, and 54401.

Problems Encountered; Safety, Technical, Quality, and Shipping:

Yokohama, Japan: The port of Yokohama is very precise; as such only minor problems were encountered as a result of language barriers and were ironed out in field. On a separate note, when shipping DART line boxes internationally we must recognize where we may have to ship from as well as to when using wood not manufactured for foreign importation.

Apia, Samoa: Overall, all shore side operations were successful. Unfortunately, the Port of Apia is not the most punctual; this is a common problem for most of the ports we visit in this region of the world.

Tauranga, New Zealand: We encountered importation issues with the support equipment sent from SSC via FedEx. Unfortunately, three days were lost waiting on customs clearances and delivery. Western Work Boats, the company contracted to assist with the recovery and loading of the drifting 54401 DART hull, was very helpful. They were contracted to supply us with Argon to inert the DART hull, they did so, but it was metric threaded. NDBC's gas kits do not support metric threads, luckily, Western was able to supply us with a regulator in order to make due.

M/V Bluefin: Overall the ship has proven to be a solid work platform. Early on the Net Reel, the primary equipment used in TAO operations on this ship, suffered a hydraulic failure. Fortunately, the Chief Engineer was able to patch the problem, but it pointed out the lack of spare replaceable items on board that have a high mission impact. The reeler survived and new hoses were supplied for the second TAO mission.

A note on quality of life aboard the Bluefin, a long standing problem in which a true solution has never been applied, is the venting of sewage gasses into all quarters of the ship. This goes beyond bothersome to a potential health hazard. Over the years this issue has waxed and waned but has never gone away no matter how much is has been reported. Recently with the increase in sea states the sewage system has been venting more often. This is an issue in which all staff are in agreement, it must be rectified.

Accomplishments:

Days at Sea: 44

170W Meridian

Recoveries: 6 Refresh

Deployments: 7 Refresh

Repairs: 0 Refresh

Visits: 0 Refresh

Lost at Sea: 0

CTD Casts: 0

DART Operations: 51425, 51426, and 54401

ARGO Float Deployments: 0

AOML Float Deployments: 14

Cruise Comments:

Unfortunately, incoming typhoons prevented the ship from servicing DART station 21413 as well as picking up a drifting DART hull off of the coast of Japan. Several days were spent harboring from passing storms and making a quick departure to avoid more. All other work proceeded on schedule.

KEO Operations:

It was a pleasure to be able to collaborate with PMEL on their Kuroshio Extension Observatory station. The deployment and subsequent recovery proceeded as planned. Seas were low to moderate which provided a smooth working environment. Appropriate station and shore time was provided. All project handoffs were hassle free.

DART Operations:

Station 51425 was adrift when the ship arrived on station. The existing BPR was recovered successfully and a new station (2.6D77) was deployed. The drifting hull (2.6D47) was recovered shortly after on the way to Apia, Samoa. The mooring was severed in the top 200m to 300m of Fish Bite. Large amounts of long line were entangled the upper mooring and showed significant chaffing.

Station 51426 was adrift (2.6D76). The existing BPR was recovered successfully and a new station (2.6D33) was deployed in its place.

Station 54401 was also adrift. The planned recovery of the existing BPR was prevented by the failure of the acoustic release. Due to a BPR communications failure, previously indicated by a SDR, we were unable to verify shutdown and were forced to move the station in case of interference. A full deployment proceeded without issue (2.6D21). The drifting hull from 54401

(2.6D81) had previously been picked up off of the coast of New Zealand. On shore in Tauranga, New Zealand the hull was inerted, stripped, and loaded onto a flat rack for return to SSC.

TAO Improvements:

Our current pickup operation can be improved with the addition of one or more pickup eyes and a hook suitable to capture them with. Our current operation includes multiple people in a coordinated effort to affix a strap to the buoy. This operation has many potential hazards. While an improvement over small boat operations, this can be improved further with a little innovation. With the implementation of pickup eyes we can remove people from hazardous functions and improve overall safety while reducing pickup times in high current areas where maneuvering is difficult.

TAO Cruise Summary

Buoy Site: 8N 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM149A
Deployed Location: 07 59.51N 170 06.06W	Deployed Date: 11/25/2015
Recovered Location: Adrift	Recovered Date: 8/26/2016
Sensors/Equipment Lost at Sea: Adrift, ALL	
Sensors Damaged/Fouled: Adrift	
Fishing/Vandalism: Adrift	
Sensors/Tubes Downloaded: Adrift	
General Comments: Adrift	

Buoy Site: 8N 170W Refresh	Mooring Depth: 5535M
Mooring Operation: Deployment	Mooring ID#: DM204A
Deployed Location: 07 59.7N 170 04.7W	Deployed Date: 8/25/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 5N 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM150A
Deployed Location: 05 01.4N 169 59.4W	Deployed Date: 11/27/2015
Recovered Location: 04 59.2N 170 00.1W	Recovered Date: 8/27/2016
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged/Fouled: T50, T150, T200	
Fishing/Vandalism: YES, Long line fishing gear entangled on nilspin.	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 5N 170W Refresh	Mooring Depth: 5781M
Mooring Operation: Deployment	Mooring ID#: DM205A
Deployed Location: 04 59.51N 169 59.30W	Deployed Date: 8/27/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 2N 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM151A
Deployed Location: 02 01.77N 170 00.23W	Deployed Date: 11/28/2015
Recovered Location: 02 02.68N 169 59.51W	Recovered Date: 8/28/2016
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged/Fouled: T75, T100, T250, TP500	
Fishing/Vandalism: YES, Long line fishing gear throughout the nilspin from 75m to 550m.	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	
Bridle shackles had nuts hanging on by the cotter pin. The pins had severe corrosion in the area where the nuts were originally secured and also in the cotter pin holes.	

Buoy Site: 2N 170W Refresh	Mooring Depth: 5393M
Mooring Operation: Deployment	Mooring ID#: DM206A
Deployed Location: 02 02.2N 169 59.9W	Deployed Date: 8/28/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 0 170W Refresh Flux	
Mooring Operation: Recovery	Mooring ID#: DM152A
Deployed Location: 00 01.14S 170 01.77W	Deployed Date: 11/30/2015
Recovered Location: 0 1.0N 139 57.5W	Recovered Date: 8/29/2016
Sensors/Equipment Lost at Sea: T250, TP300, TP500, ACOUSTIC RELEASE	
Sensors Damaged/Fouled: TC5, SONTEK12, TC100, SONTEK103, SONTEK152	
Fishing/Vandalism: Yes. Long line fishing gear starting around 100m to 175m.	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	
Acoustic release failed to release. Numerous attempts throughout evolution were unsuccessful. A line cutter was deployed without success. The line tension safety limit was reached so the decision was made to cut the nilspin at approximately 210m, thus sacrificing 3 sensors.	

Buoy Site: 0 170W Refresh Flux	Mooring Depth: 5624M
Mooring Operation: Deployment	Mooring ID#: DM207A
Deployed Location: 00 00.9S 170 01.9W	Deployed Date: 8/29/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 0 170W ADCP	
Mooring Operation: Recovery	Mooring ID#: KA019
Deployed Location: 00 00.082S 169 43.681W	Deployed Date: 11/30/2015
Recovered Location: 00 00.082S 169 43.681W	Recovered Date: 8/30/2016
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged/Fouled: NONE	
Fishing/Vandalism: NONE	
Sensors/Tubes Downloaded: Sent to lab for download	
General Comments: NONE	

Buoy Site: 0 170W ADCP	Mooring Depth: 5456M
Mooring Operation: Deployment	Mooring ID#: KA020
Deployed Location: 00 00.19N 169 43.04W	Deployed Date: 8/30/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: Eliminated nylon below the float with field splice of HMPE in order to reduce the stretch of the mooring.	

Buoy Site: 2S 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM153A
Deployed Location: 02 09.42S 170 00.09W	Deployed Date: 12/2/2016
Recovered Location: 02 10.8S 170 01.4W	Recovered Date: 8/31/2016
Sensors/Equipment Lost at Sea: Tower missing, all top side sensors	
Sensors Damaged/Fouled: SSC, T50	
Fishing/Vandalism: YES, Tower was removed from buoy. Two of the tower bolts were removed with only one remaining with a broken pad eye still attached.	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 2S 170W Refresh	Mooring Depth: 4961M
Mooring Operation: Deployment	Mooring ID#: DM208A
Deployed Location: 02 09.8S 170 01.2W	Deployed Date: 2/28/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 5S 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM154A
Deployed Location: 04 59.19S 169 59.04W	Deployed Date: 12/3/2015
Recovered Location: 05 00.16S 170 01.2W	Recovered Date: 9/1/2016
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged/Fouled: NONE	
Fishing/Vandalism: NONE	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 5S 170W Refresh	Mooring Depth: 5416M
Mooring Operation: Deployment	Mooring ID#: DM209A
Deployed Location: 04 59.53S 170 00.19W	Deployed Date: 9/1/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison. Squalls at the time of weather observation.	

Buoy Site: 8S 170W Refresh	
Mooring Operation: Recovery	Mooring ID#: DM155A
Deployed Location: 07 57.80S 170 01.60W	Deployed Date: 12/4/2015
Recovered Location: 07 58.01S 170 01.98W	Recovered Date: 9/2/2016
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged/Fouled: NONE	
Fishing/Vandalism: NONE	
Sensors/Tubes Downloaded: Sent to Lab for download	
General Comments: No shipboard SST or SSC available for comparison.	

Buoy Site: 8S 170W Refresh	Mooring Depth: 5378M
Mooring Operation: Deployment	Mooring ID#: DM210A
Deployed Location: 07 58.11S 170 02.35W	Deployed Date: 9/3/2016
Pre-Deployment On Deck Instrument Failures: NONE	
Sensors/Equipment Lost at Sea: NONE	
Sensors Damaged During Deployment: NONE	
General Comments: No shipboard SST or SSC available for comparison.	

AOML Floats				
Coordinates LAT/LONG		Date/Time	SN#	Comments
05 00.3N	169 59.2W	27 AUG 16 09:13	39971 & 102563	
03 00.28N	170 01.36W	27 AUG 16 20:41	102546 & 102545	
00 00.56S	170 00.37W	29 AUG 16 15:45	145634 & 145647	
03 00.1S	170 01.3W	31 AUG 16 1640	146535 & 145640	
05 01.3S	170 00.7W	01 SEPT 16 14:10	145670, 145660 & 14566	
07 58.8S	170 02.9W	03 SEPT 16 02:10	145677, 145710 & 145669	

NDBC TAO Equipment Lost at Sea		
Property #	Description	Reason for Lost at Sea
CD0004178046	TAO HULL	ADRIFT, NOT TRANSMITTING
37452	TAO PAYLOAD	ADRIFT, NOT TRANSMITTING
37045	IRIDIUM MODEM	ADRIFT, NOT TRANSMITTING
36665	GPS/IRIDIUM ANTENNA	ADRIFT, NOT TRANSMITTING
36917	ANEMOMETER	ADRIFT, NOT TRANSMITTING
36512	AT/RH	ADRIFT, NOT TRANSMITTING

35196	SBE37S	ADRIFT, NOT TRANSMITTING
36602	SBE39	ADRIFT, NOT TRANSMITTING
36603	SBE39	ADRIFT, NOT TRANSMITTING
36604	SBE39	ADRIFT, NOT TRANSMITTING
38935	SBE39	ADRIFT, NOT TRANSMITTING
38936	SBE39	ADRIFT, NOT TRANSMITTING
38937	SBE39	ADRIFT, NOT TRANSMITTING
38938	SBE39	ADRIFT, NOT TRANSMITTING
38811	SBE39+P	ADRIFT, NOT TRANSMITTING
38818	SBE39+P	ADRIFT, NOT TRANSMITTING
CD0001694611	ACOUSTIC RELEASE	ADRIFT, NOT TRANSMITTING
29714	SBE39	EQUIPMENT FAILURE
31053	SBE39+P	EQUIPMENT FAILURE
29722	SBE39+P	EQUIPMENT FAILURE
32269	ACOUSTIC RELEASE	EQUIPMENT FAILURE
39684	TAO PAYLOAD	VANDALISM
36208	IRIDIUM MODEM	VANDALISM
36827	GPS/IRIDIUM ANTENNA	VANDALISM
39176	ANEMOMETER	VANDALISM
38756	AT/RH	VANDALISM

NDBC DART Equipment Lost at Sea		
Property #	Description	Reason for Lost at Sea
31687	BPR Enclosure	BPR Unrecoverable
32167	PAROS	BPR Unrecoverable
37079	Transducer	BPR Unrecoverable
37344	Strobe	BPR Unrecoverable
39143	CPU Battery Assembly	BPR Unrecoverable
33216	Acoustic Release	BPR Unrecoverable

Mission Objectives Summary

Buoy Operations			
Station	Operation	Completed	Not Completed
8N 170W Refresh	R/D	X	
5N 170W Refresh	R/D	X	
2N 170W Refresh	R/D	X	
0 170W ADCP	R/D	X	
0 170W Refresh FLUX	R/D	X	
2S 170W Refresh	R/D	X	
5S 170W Refresh	R/D	X	
8S 175W Refresh	R/D	X	

DART 21413	R/D		X
DART 51425	R/D	X	
DART 51426	R/D	X	
DART 54401	R/D	X	
Total Objectives		12	
Objectives Completed		11	
Objectives Not Completed		0	
Percent of Objectives Met		92%	