

TROPICAL ATMOSPHERE-OCEAN (TAO) PROGRAM
FINAL CRUISE REPORT
DA-13-05-BLFN

Area: Equatorial Pacific between 8°N and 8°S latitude along 165°E Longitude.

Itinerary:

DA-13-05-BLFN DEP *July 29, 2013, Agana, Guam*

ARR *August 26, 2013, Pago Pago, American Samoa*

CRUISE DESCRIPTION

The Tropical Atmosphere Ocean (TAO) array consists of 70 buoys utilizing a taut line mooring configuration used to mount data collection sensors for climate research purposes. Fifteen buoys are serviced by JAMSTEC and the remaining 55 buoys from 95°W longitude to 165°E longitude are serviced by National Data Buoy Center (NDBC). Repair and maintenance of the buoys is performed by NDBC contracted personnel on an annual basis utilizing the NOAA Ships and other contract vessels. The buoys' deployment lifecycles are up to 18 months to ensure at least one year of data collection can be completed.

NDBC Points of Contact:

NDBC Program Manager

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TAO Cruise Objective and Plan:

The objective of this cruise was the maintenance of the TAO Array along the 155°W meridian.

The scientific complement for the cruise embarked at Agana, Guam on July 28, 2013. The ship departed on July 29, 2013 and conducted operations as listed in Section 2.1. The ship arrived in Pago Pago, American Samoa on August 26, 2013.

1.0 PERSONNEL

1.1 CRUISE LEAD AND PARTICIPATING SCIENTISTS:

Cruise Lead: William Thompson.

Participating Scientists:

Name	Gender	Nationality	Affiliation
William Thompson	M	US	NOAA/NDBC
James Rauch	M	US	NOAA/NDBC
Mike Brewer	M	US	NOAA/NDBC
Lee Tretbar	M	US	NOAA/NDBC
Brian Guchereau	M	US	NOAA/NDBC

2.0 OPERATIONS

2.1 TAO Data Recovery Summary

Mooring Operations conducted are shown in the tables below. The following provides details on the data recovery efforts for the buoys serviced. All noted times in this summary report are Coordinated Universal Time (UTC):

Cruise Summary

Buoy Site: 0 165E ADCP	
Mooring Operation: Recovery	Mooring ID#: WA012
Deployed Location: 00 00.969N 165 13.044E	Deployed Date: 11/13/2011
Recovered Location: 00 44.103S 147 43.897E	Recovered Date: 8/3/2013
Previous Repair Date: None	
Sensors/Equipment Lost at Sea: Both acoustic releases: CD0001694582, CD0001694573	
Sensors Damaged/Fouled: None	
Fishing/Vandalism: None	
Sensors/Tubes Downloaded: Sent to lab for download.	

General Comments: Float was adrift off station. The failure point was found in the upper Nylon below the float. It appears to have had abrasion over a period of time.

Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
ADCP	5/11/13	ADCP adrift	ADCP adrift

Buoy Site: 8N 165E ATLAS

Mooring Operation: Recovery		Mooring ID#: PM991A	
Deployed Location: 08 03.013N 165 09.014E		Deployed Date: 11/9/2011	
Recovered Location: NA		Recovered Date: NA	
Sensors/Equipment Lost at Sea: ALL			
Sensors Damaged/Fouled: ADRIFT			
Fishing/Vandalism: ADRIFT			
Sensors/Tubes Downloaded: ADRIFT			
General Comments: ADRIFT, not recovered			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
Buoy	6/1/12	Buoy adrift	Buoy adrift, not recovered

Buoy Site: 8N 165E REFRESH		Mooring Depth: 5213M	
Mooring Operation: Deployment		Mooring ID#: DM052A	
Deployed Location: 08 03.23N 165 08.61E		Deployed Date: 8/11/2013	
Pre-Deployment On Deck Instrument Failures: Original tube failed. Entire system replaced.			
Sensors/Equipment Lost at Sea: None			
Sensors Damaged During Deployment: None			
General Comments: The original system planned for this site had a premature failure on deck.			

Buoy Site: 5N 165E REFRESH			
Mooring Operation: Recovery		Mooring ID#: DM027A	
Deployed Location: 05 02.38N 165 00.75E		Deployed Date: 11/10/2011	
Recovered Location: 05 02.63N 165 00.73E		Recovered Date: 8/12/2013	
Sensors/Equipment Lost at Sea: WIND			
Sensors Damaged/Fouled: SSC, T25, T50, T75 fouled			
Fishing/Vandalism: None			
Sensors/Tubes Downloaded: Sent to lab for download.			
General Comments: Upper stanchion missing appears to have worked its way off and broke off the alignment pin. Topsection severed at boss clamp, about 2.5' of the hydraulic hose was			

missing most of the outer layer of rubber and the woven steel braid was corroded away.

Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
Wind	12/11/11	Data erratic	Upper stanchion missing
SSC – TP500	7/3/13	Data sporadic or missing	Top section heavily corroded, first 4 depths fouled
ATMP	7/2/13	Data erratic	None
RH	5/26/12	Data drifted too high	None

Buoy Site: 5N 165E REFRESH	Mooring Depth: 4792M
Mooring Operation: Deployment	Mooring ID#: DM053A
Deployed Location: 05 06.075N 164 54.110E	Deployed Date: 8/13/2013
Pre-Deployment On Deck Instrument Failures: None	
Sensors/Equipment Lost at Sea: None	
Sensors Damaged During Deployment: None	
General Comments: None	

Buoy Site: 2N 165E ATLAS			
Mooring Operation: Recovery	Mooring ID#: PM992A		
Deployed Location: 02 00.59N 164 59.914E	Deployed Date: 11/12/2011		
Recovered Location: 02 01.6N 165 00.3E	Recovered Date: 8/13/2013		
Previous Repair Date: None			
Sensors/Equipment Lost at Sea: None			
Sensors Damaged/Fouled: T25 & TP300 broken mount, T100-TP500 inverted, SSC – T50 fouled			
Fishing/Vandalism: None			
Sensors/Tubes Downloaded: All but SSC, T25, T50, T100, TP300 – dead batteries			
General Comments: Pickle fork used on deployment.			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
SST	2/28/13	Data stuck	Fouled, Dead battery
SSC	1/7/13	Drifted too low	Fouled, Dead battery
T25	8/9/13	Data missing	Fouled, Dead battery
T50	7/8/13	Data missing	Fouled, Dead battery
T100	6/7/13	Data missing	Dead battery
TP300	6/10/12	Data missing	Dead battery

Buoy Site: 2N 165E REFRESH	Mooring Depth: 4172M
Mooring Operation: Deployment	Mooring ID#: DM054A
Deployed Location: 02 00.14N 165 08.6E	Deployed Date: 8/14/2013
Pre-Deployment On Deck Instrument Failures: None	
Sensors/Equipment Lost at Sea: None	
Sensors Damaged During Deployment: None	
General Comments: None	

Buoy Site: 0 165E ADCP	Mooring Depth: 4385M
Mooring Operation: Deployment	Mooring ID#: WA013
Deployed Location: 00 00.969N 165 13.603E	Deployed Date: 8/15/2013
Pre-Deployment On Deck Instrument Failures: None	
Sensors/Equipment Lost at Sea: None	
Sensors Damaged During Deployment: None	
General Comments: None	

Buoy Site: 0 165E ATLAS FLUX			
Mooring Operation: Recovery		Mooring ID#: PM958B	
Deployed Location: 00 00.12N 164 59.92E		Deployed Date: 3/1/2011	
Recovered Location: 00 00.2N 164 58.4E		Recovered Date: 8/15/2013	
Previous Repair Date: 11/12/2011			
Sensors/Equipment Lost at Sea: TC50, TP300			
Sensors Damaged/Fouled: SSC – T30 fouled			
Fishing/Vandalism: None			
Sensors/Tubes Downloaded: TP500, T400, T250, T225, T200, and T175			
General Comments: A supposed 10m dive op repair replaced the 5m sensor by mistake. Both the 5m and 10m sensor have the same address. --Repair operation took place on 11/12/11. Equilibrator bent and not moving.			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
Buoy (Tube)	1/12/13	Xmits ceased	No comms
SSC	11/24/11	Data erratic	Fouled, Dead battery
SST	11/25/11	Data missing	Fouled, Dead battery
C5	3/1/11	Data missing	Fouled, Dead battery
T5	9/30/11	Data missing	Fouled, Dead battery
C10	3/1/11	Data missing	Fouled, Dead battery
T10	11/10/11	Data missing	Fouled, Dead battery
V10	3/1/11	Data missing	Fouled, No comms cable
T13	3/1/11	Data missing	Fouled, Dead battery
TC25	11/12/11	Data missing	Fouled, Dead battery
T30	3/1/11	Data missing	Fouled, Dead battery
TC50	12/18/11	Data missing	Lost at sea

T53	11/12/11	Data missing	None
TC75	7/2/12	Data missing	None
V100	11/10/12	Data missing	No comms cable
TC100	11/18/12	Data missing	None
T103	3/1/11	Data missing	None
TC125	11/2/12	Data missing	None
T150	12/12/12	Data missing	None
T175	3/1/11	Data missing	None
T200	12/12/12	Data missing	None
V200	11/26/12	Data missing	No comms cable
T203	3/1/11	Data missing	Dead battery
T225	3/1/11	Data missing	None
T250	12/12/12	Data missing	None
TP300	11/12/11	Data missing	Lost at sea
T400	3/1/11	Data missing	None
TP500	12/12/12	Data missing	None

Buoy Site: 0 165E ATLAS FLUX		Mooring Depth: 4406M	
Mooring Operation: Deployment		Mooring ID#: QM019A	
Deployed Location: 00 00.164S 164 59.785E		Deployed Date: 8/15/2013	
Pre-Deployment On Deck Instrument Failures: None			
Sensors/Equipment Lost at Sea: None			
Sensors Damaged During Deployment: None			
General Comments: No poison pucks available. Top section recovered from PM992A on 8/13/13 was used for this deployment.			

Buoy Site: 2S 165E REFRESH			
Mooring Operation: Recovery		Mooring ID#: DM028A	
Deployed Location: 01 59.989S 164 59.967E		Deployed Date: 11/14/2011	
Recovered Location: NA		Recovered Date: NA	
Sensors/Equipment Lost at Sea: ALL			
Sensors Damaged/Fouled: ADRIFT			
Fishing/Vandalism: BUOY ADRIFT			
Sensors/Tubes Downloaded: None			
General Comments: ADRIFT and not recovered			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
Buoy	2/18/12	Buoy adrift	Buoy adrift, not recovered

Buoy Site: 2S 165E REFRESH	Mooring Depth: 4465M
Mooring Operation: Deployment	Mooring ID#: DM055A
Deployed Location: 01 59.949S 165 00.198E	Deployed Date: 8/16/2013
Pre-Deployment On Deck Instrument Failures: None	
Sensors/Equipment Lost at Sea: None	
Sensors Damaged During Deployment: None	
General Comments: None	

Buoy Site: 5S 165E ATLAS			
Mooring Operation: Recovery		Mooring ID#: PM959A	
Deployed Location: 05 00.028S 165 10.070E		Deployed Date: 3/3/2011	
Recovered Location: 04 59.9S 165 10.4E		Recovered Date: 8/17/2013	
Sensors/Equipment Lost at Sea: Rain gauge, T50, T150, T200.			
Sensors Damaged/Fouled: T125 broken mount, SSC & T25 fouled			
Fishing/Vandalism: Long line spiraled around mooring and cuts in the Nilspin.			
Sensors/Tubes Downloaded: All recovered sensors but SSC, T25, T75, T125 due to dead batteries.			
General Comments: None			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
Buoy (Tube)	8/8/12	Xmits ceased	No comms
Rain	1/3/12	Data missing	Lost at sea
SSC	1/28/12	Data erratic	Fouled, Dead battery
SST	8/3/12	Data missing	Fouled, Dead battery
T25	8/8/12	Data missing	Fouled, Dead battery
T50	6/30/12	Data missing	Lost at sea
T75	8/8/12	Data missing	Dead battery
T125	8/8/12	Data missing	Damaged, Dead battery
T150	8/8/12	Data missing	Lost at sea
T200	10/2/11	Data missing	Lost at sea

Buoy Site: 5S 165E ATLAS	Mooring Depth: 2497M
Mooring Operation: Deployment	Mooring ID#: QM020A
Deployed Location: 05 00.025S 165 10.023E	Deployed Date: 8/17/2013
Pre-Deployment On Deck Instrument Failures: None.	
Sensors/Equipment Lost at Sea: None	
Sensors Damaged During Deployment: None	
General Comments: Tube time off by -12 hours	

Buoy Site: 8S 165E REFRESH			
Mooring Operation: Recovery		Mooring ID#: DM029A	
Deployed Location: 08 01.53S 164 46.80E		Deployed Date: 11/16/2011	
Recovered Location: 08 01.49S 65 46.07E		Recovered Date: 8/19/2013	
Sensors/Equipment Lost at Sea: Acoustic Release			
Sensors Damaged/Fouled: SSC – T75, T150 fouled; SSC broken cable, connector damaged			
Fishing/Vandalism: Long line found on the mooring, mainlines were wrapped around Nilspin. Trailing line was too heavy to pull in so it was cut free.			
Sensors/Tubes Downloaded: Sent to lab for download.			
General Comments: None			
Site Sensor Failures	Date Data Flagged	Why Data Flagged	Field Service Observations
RH	5/23/12	Drifted too high	None
SSC	8/9/12	Data missing	Fouled, broken cable

Buoy Site: 8S 165E ATLAS		Mooring Depth: 3893M	
Mooring Operation: Deployment		Mooring ID#: DM021A	
Deployed Location: 08 01.30S 164 49.70E		Deployed Date: 8/19/2013	
Pre-Deployment On Deck Instrument Failures: None			
Sensors/Equipment Lost at Sea: None			
Sensors Damaged During Deployment: P500 Not reporting after deployment			
General Comments: CO2 buoy deployed with heavy anchor. No poison pucks on hand.			

2.2 CTD Casts Completed

No CTD casts were taken on this cruise.

2.3 Ancillary Science Projects Completed on the Cruise

The following outlines the ancillary science work performed in conjunction with the TAO operations on the cruise:

Pacific Marine Environmental Laboratory (PMEL) Argo Profiling CTD Floats

Three (3) Argo floats were scheduled for deployment on this cruise. The chief scientist verified and briefed the Operations Officer on the deployment positions prior to the start of the cruise. All Argo Float deployments were completed as scheduled.

Questions concerning ARGO Floats should be directed to:

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or

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The following outlines the Argo floats deployed during the cruise:

ARGO Floats				
Coordinates		Date	SN#	Comments
02 00.67N	165 06.79E	8/14/2013	F0220	
00 00.529S	165 00.296E	8/15/2013	F0221	
02 00.430S	165 01. 2E	8/16/2013	F0225	