TROPICAL ATMOSPHERE-OCEAN (TAO) PROGRAM

FINAL CRUISE REPORT

RB-14-05

Area: Equatorial Pacific: 8°N 170°W to 8°S 170°W and 8°S 165°E to 8°N 165°E

Itinerary:

RB-14-05 DEP *October 6, 2014, Honolulu, HI*

ARR *November 1, 2014, Kwajalein Atoll, RMI*

## 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.

The NOAA Ship *Ronald H. Brown* experienced an A-Frame hydraulic failure while recovering 5S 170W. Because the A-frame could not be moved, 8S 170W was not recovered, but we were able to deploy a new buoy there. The ship then departed 8S 170W and went to an American Samoan shipyard for repairs, losing 2 days of project time.

The Marine Scientific Research (MSR) permit from the Solomon Islands was not granted in time for this cruise. Therefore the 8S 165E buoy could not be recovered or deployed.

## NDBC Points of Contact


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TAO Cruise Objective and Plan:

The objective of this cruise was the maintenance of the TAO Array along the 170°W, and 165°E meridians.

The scientific complement for the cruise embarked at Honolulu, HI on October 5, 2014. The ship departed on October 6, 2014 and conducted operations as listed in Section 2.1. The ship arrived at Kwajalein Atoll, RMI on November 1, 2014.

## 1.0 **PERSONNEL**

### 1.1 *CRUISE LEAD AND PARTICIPATING SCIENTISTS*:

Cruise Lead: Brian Lake.

Participating Scientists:

| Name | Gender | Nationality | Affiliation |
|---|---|---|---|
| Brian Lake | M | US | NOAA/NDBC |
| James Rauch | M | US | NOAA/NDBC |
| James Coleman | 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:** 8N 170W REFRESH | |
| **Mooring Operation:** Recovery | **Mooring ID#:** DM038 |
| **Deployed Location:** 08-00.26N 170-02.72W | **Deployed Date:** 5/13/12 |
| **Recovered Location:** 08-00.26N 170-02.72W | **Recovered Date:** 10/10/14 |
| **Sensors/Equipment Lost at Sea:** Anemometer, ATRH, payload | |
| **Sensors Damaged/Fouled:** SSC, 25m T sensors fouled | |
| **Fishing/Vandalism:** Missing tower, longline gear at 300m TP | |

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|---|---|---|---|
| **Sensors/Tubes Downloaded:** No sensors were downloaded as per new procedures | | | |
| **General Comments:** Tower ripped from buoy | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| All (Tube) | 5/13/12 | No transmissions | Tower missing |

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|---|---|
| **Buoy Site:** 8N 170W REFRESH | **Mooring Depth:** 5525 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM095 |
| **Deployed Location:** 08-01.48N 170-03.16W | **Deployed Date:** 10/11/2014 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|---|---|
| **Buoy Site:** 5N 170W ATLAS | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** PM990 | |
| **Deployed Location:** 05-00.745N 170-00.97W | | **Deployed Date:** 10/22/11 | |
| **Recovered Location:** 05-00.745N 170-00.97W | | **Recovered Date:** 10/11/14 | |
| **Sensors/Equipment Lost at Sea:** T100, T125, T150, T200, TP500 lost at sea | | | |
| **Sensors Damaged/Fouled:** T25 fouled | | | |
| **Fishing/Vandalism:** longline on Nilspin from 200 m to bottom of Nilspin. | | | |
| **Sensors/Tubes Downloaded:** Only T250 wsa downloaded successfully, the others were either lost or had no communications. | | | |
| **General Comments:** | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| All (Tube) | 12/21/13 | No transmissions | No comms |
| SSC | 1/3/13 | Data too low | No comms |
| SST | 1/11/13 | Data missing | No comms |
| T25 | 7/21/13 | Data missing | No comms |
| T50 | 11/18/13 | Data missing | No comms |
| T75 | 12/18/13 | Data missing | No comms |
| T100 | 12/18/13 | Data missing | Lost at sea |
| T125 | 12/18/13 | Data missing | Lost at sea |
| T150 | 8/9/13 | Data missing | Lost at sea |
| T200 | 4/30/12 | Data missing | Lost at sea, fishing line |
| T250 | 12/18/13 | Data missing | Fishing line |
| TP300 | 12/18/13 | Data missing | No comms, fishing line |
| TP500 | 4/10/13 | Data missing | Lost at sea, fishing line |

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|---|---|
| **Buoy Site:** 5N 170W REFRESH | **Mooring Depth:** 5762 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM096 |
| **Deployed Location:** 05-00.963N 169-59.506W | **Deployed Date:** 10/12/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment | |

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|---|---|---|---|
| **Buoy Site:** 2N 170W REFRESH | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** DM026 | |
| **Deployed Location:** 01-58.09N 170-01.89W | | **Deployed Date:** 10/20/11 | |
| **Recovered Location:** NA | | **Recovered Date:** NA | |
| **Previous Repair Date:** 5/15/12 | | | |
| **Sensors/Equipment Lost at Sea:** All equipment lost at sea | | | |
| **Sensors Damaged/Fouled:** NA | | | |
| **Fishing/Vandalism:** Buoy went adrift and went aground on an island, lost at sea | | | |
| **Sensors/Tubes Downloaded:** NA | | | |
| **General Comments:** All equipment lost at sea | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| All (Tube) | 10/5/13 | Adrift outside data grid | Lost at sea |
| Wind | 5/25/12 | WDIR erratic | Lost at sea |
| SST, SSC | 8/5/13 | Data missing | Lost at sea |
| T25 – T100 | 9/30/13 | Data missing | Lost at sea |
| T125 | 4/17/13 | Data missing | Lost at sea |
| T150 – TP500 | 9/30/13 | Data missing | Lost at sea |

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|---|---|
| **Buoy Site:** 2N 170W REFRESH | **Mooring Depth:** 5392 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM097 |
| **Deployed Location:** 02-02.08N 169-59.04W | **Deployed Date:** 10/13/14 |
| **Pre-Deployment On Deck Instrument Failures:** Spare tube used as primary tube failed on deck. | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Fishing vessel *Jeannine* was in the area during deployment. | |

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|---|---|---|---|
| **Buoy Site:** 0 170W ATLAS/Flux/CO2 | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** QM012 | |
| **Deployed Location:** 00-01.376S 170-01.936W | | **Deployed Date:** 5/16/12 | |
| **Recovered Location:** 00-01.376S 170-01.936W | | **Recovered Date:** 10/15/14 | |
| **Previous Repair Date:** None | | | |
| **Sensors/Equipment Lost at Sea:** Payload, ATRH, Wind, Rain gauge, SWR, LWR, barometer, 12m Sontek, TC75 and TP500 lost at sea. | | | |
| **Sensors Damaged/Fouled:** SSC, TC5, TC10 fouled | | | |
| **Fishing/Vandalism:** Tower missing | | | |
| **Sensors/Tubes Downloaded:** TC125, T150, TV153, T200 and T250 were downloaded. The other were either lost at sea or had no communications. | | | |
| **General Comments:** Tower missing | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| All (Tube) | 5/20/12 | No transmissions | Tower missing |
| 12m Sontek | 5/20/12 | Data missing | Lost at sea |
| TC75 | 5/20/12 | Data missing | Lost at sea |
| TP500 | 5/20/12 | Data missing | Lost at sea |

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|---|---|---|---|
| **Buoy Site:** 0 170W REFRESH/Flux | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** DM039 | |
| **Deployed Location:** 00-03.34S 170-04.11W | | **Deployed Date:** 5/15/12 | |
| **Recovered Location:** 00-03.34S 170-04.11W | | **Recovered Date:** 10/14/14 | |
| **Previous Repair Date:** None | | | |
| **Sensors/Equipment Lost at Sea:** Rain guage | | | |
| **Sensors Damaged/Fouled:** All subsurface sensors were fouled down to 103 m. SWR and LWR damaged | | | |
| **Fishing/Vandalism:** Radiation sensors damaged. Rain gauge gone. | | | |
| **Sensors/Tubes Downloaded:** None. | | | |
| **General Comments:** Topsection broken at base. | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| Wind | 7/19/14 | WDIR/Compass missing | None |
| Rain | 11/8/13 | Data missing | Lost at sea |
| RH | 12/31/12 | Data too high | None |
| ATMP | 9/20/13 | Data erratic | None |
| SSC, SST | 7/19/14 | Data missing | No comms, fouled |
| C5 | 9/2/12 | Data too low | Fouled, slid to 10m, No comms |
| T5 | 5/2/14 | Excessive spiking | Fouled, slid to 10m, No comms |
| T10 | 5/2/14 | Excessive spiking | No comms |

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|---|---|---|---|
| C10 | 4/9/14 | Data erratic | No comms |
| V10 | 6/7/12 | Data missing | Cable cut |
| T25 | 3/15/14 | Excessive spiking | No comms, fouled |
| T50 | 12/27/13 | Data missing | No comms, fouled |
| C50 | 12/30/12 | Data too low | No comms, fouled |
| V50 | 5/15/12 | Data missing | Bad cables |
| T75 | 12/16/13 | Data missing | No comms, fouled |
| C75 | 12/16/13 | Data missing | No comms, fouled |
| T100 | 4/10/13 | Data missing | No comms, fouled |
| C100 | 4/10/13 | Data missing | No comms, fouled |
| V100 | 5/15/12 | Data missing | Bad cables |
| V150 | 7/20/12 | Data missing | Cable cut |
| T125 | 5/2/14 | Excessive spiking | No comms, slid 10m |
| C125 | 3/19/14 | Data missing | No comms, slid 10m |
| T150 | 5/2/14 | Excessive spiking | None |
| T200 | 5/2/14 | Excessive spiking | None |
| T250 | 5/2/14 | Excessive spiking | None |
| TP300 | 5/2/14 | Excessive spiking | None |
| TP500 | 5/2/14 | Excessive spiking | No comms |

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| **Buoy Site:** 0 170W REFRESH/CO2/Flux | **Mooring Depth:** 5600 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM098 |
| **Deployed Location:** 00-01.358S 170-01.436W | **Deployed Date:** 10/15/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment | |

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|---|---|
| **Buoy Site:** 0 170W ADCP | |
| **Mooring Operation:** Recovery | **Mooring ID#:** KA017 |
| **Deployed Location:** 00.00.36S 169-44.195W | **Deployed Date:** 5/16/12 |
| **Recovered Location**00.00.36S 169-44.195W | **Recovered Date:** 10/13/14 |
| **Previous Repair Date:** NA | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged/Fouled:** None | |
| **Fishing/Vandalism:** None | |
| **Sensors/Tubes Downloaded:** None. | |
| **General Comments:** None | |

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| **Buoy Site:** 0 170W ADCP | **Mooring Depth:** 5438 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** KA018 |
| **Deployed Location:** 00-00.1928N 169-43.844W | **Deployed Date:** 10/14/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment | |

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|---|---|---|---|
| **Buoy Site:** 2S 170W REFRESH | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** DM040 | |
| **Deployed Location:** 02-09.3S 170-00.96W | | **Deployed Date:** 5/18/12 | |
| **Recovered Location:** 02-09.3S 170-00.96W | | **Recovered Date:** 10/15/14 | |
| **Previous Repair Date:** None | | | |
| **Sensors/Equipment Lost at Sea:** None | | | |
| **Sensors Damaged/Fouled:** tube enclosure was damaged, SSC, T25, T50 fouled, T200, T250, TP300 and TP500 fouled with fishing line. | | | |
| **Fishing/Vandalism:** longline on Nilspin and 3 spools of nylon | | | |
| **Sensors/Tubes Downloaded:** None. | | | |
| **General Comments:** None | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| All (Tube) | 6/4/14 | No transmissions | None |
| ATMP | 3/14/14 | Data erratic | None |
| RH | 5/25/12 | Data too high | None |
| SST, SSC | 2/3/14 | Data missing | Fouled, No comms |
| T25 | 6/24/13 | Excessive spiking | Slid to 50m, fouled |
| T50 | 6/24/13 | Excessive spiking | Fouled |
| T75 | 6/24/13 | Excessive spiking | None |
| T100 | 6/24/13 | Excessive spiking | None |
| T125 | 6/24/13 | Excessive spiking | No comms |
| T150 | 6/24/13 | Excessive spiking | None |
| T200 | 6/24/13 | Excessive spiking | Fishing gear |
| T250 | 6/24/13 | Excessive spiking | Fishing gear |
| TP300 | 6/24/13 | Excessive spiking | Fishing gear |
| TP500 | 6/24/13 | Excessive spiking | Fishing gear |

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|---|---|
| **Buoy Site:** 2S 170W REFRESH | **Mooring Depth:** 4955 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM099 |
| **Deployed Location:** 02-10.035S 170-00.80W | **Deployed Date:** 10/16/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |

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| **Sensors/Equipment Lost at Sea:** None |
| **Sensors Damaged During Deployment:** None |
| **General Comments:** Routine deployment. |

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| **Buoy Site:** 5S 170W ATLAS | |
| **Mooring Operation:** Recovery | **Mooring ID#:** PM989 |
| **Deployed Location:** 04-59.51S 170-0.45W | **Deployed Date:** 10/17/11 |
| **Recovered Location:** 04-59.51S 170-0.45W | **Recovered Date:** 10/16/14 |
| **Previous Repair Date:** None | |
| **Sensors/Equipment Lost at Sea:** Wind, T25, T100, T125, T150, TP300 and TP500 lost at sea. | |
| **Sensors Damaged/Fouled:** T50 fouled | |
| **Fishing/Vandalism:** None | |
| **Sensors/Tubes Downloaded:** T200 and T250 were downloaded. All other sensors were either lost at sea or had no communications. | |
| **General Comments:** Release would not communicate. After reaching the 500 m sensor, the mooring line was cut. | |

| Site Sensor Failures | Date Data Flagged | Why Data Flagged | Field Service Observations |
|---|---|---|---|
| All (Tube) | 4/14/13 | No transmissions | None |
| SST | 10/22/12 | Data missing | No comms |
| SSC | 10/20/12 | Data missing | No comms |
| T25 | 4/13/13 | Data missing | Lost at sea |
| T50 | 4/13/13 | Data missing | No comms |
| T75 | 4/13/13 | Data missing | No comms |
| T100 | 4/13/13 | Data missing | Lost at sea |
| T125 | 6/14/12 | Data missing | Lost at sea |
| T150 | 6/14/12 | Data missing | Lost at sea |
| T200 | 4/13/13 | Data missing | None |
| T250 | 4/13/13 | Data missing | None |
| TP300 | 4/13/13 | Data missing | Lost at sea, fishing line |
| TP500 | 10/20/12 | Data missing | Lost at sea |

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|---|---|
| **Buoy Site:** 5S 170W REFRESH | **Mooring Depth:** 5421 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM100 |
| **Deployed Location:** 04-59.95S 170-00.814W | **Deployed Date:** 10/17/14 |
| **Pre-Deployment On Deck Instrument Failures:** Payload failed on deck, swapped in spare | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|
| **Buoy Site:** 8S 170W REFRESH | **Mooring Depth:** 5362 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM101 |
| **Deployed Location:** 07-59.42S 170-01.3W | **Deployed Date:** 10/17/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|---|---|
| **Buoy Site:** 5S 165E ATLAS | | | |
| **Mooring Operation:** Recovery | | **Mooring ID#:** QM020 | |
| **Deployed Location:** 05-00.025S 165-10.023E | | **Deployed Date:** 8/17/13 | |
| **Recovered Location:** 05-00.3S 165-10.12E | | **Recovered Date:** 10/26/14 | |
| **Previous Repair Date:** None | | | |
| **Sensors/Equipment Lost at Sea:** T75 and T200 lost | | | |
| **Sensors Damaged/Fouled:** SSC, T25 and T50 fouled. | | | |
| **Fishing/Vandalism:** Longline gear on Nilspin and first spool of nylon. | | | |
| **Sensors/Tubes Downloaded:** All recovered sensors were downloaded successfully, except T50 and T150. | | | |
| **General Comments:** | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| T50 | 8/7/13 | Data missing | No comms |
| T75 | 2/14/14 | Data missing | Lost at sea |
| T150 | 9/2/14 | Data missing | No comms |
| T200 | 6/4/14 | Data missing | Lost at sea |

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|---|---|
| **Buoy Site:** 5S 165E REFRESH | **Mooring Depth:** 2488 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM102 |
| **Deployed Location:** 05-00.759S 165-10.02E | **Deployed Date:** 10/26/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|
| **Buoy Site:** 2S 165E | **Mooring Depth:** 4465 m |
| **Mooring Operation:** Repair | **Mooring ID#:** DM055 |
| **Deployed Location:** 01-59.949S 165-00.198E | **Deployed Date:** 8/16/13 |
| **Repair Location:** 02-00.106S 165-00.463E | **Repaired Date:** 10/27/14 |
| **Sensors/Equipment Lost at Sea:** Anemometer, upper stanchion broken off at sheer point | |

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|---|---|---|---|
| **Sensors Damaged/Fouled:** Wind bird missing, replaced with new one | | | |
| **Fishing Vandalism:** Small hand line with weights hanging of top ring. | | | |
| **Sensors/Tubes Downloaded:** None | | | |
| **General Comments:** None | | | |
| **Site Sensor Failures** | **Date Data Flagged** | **Why Data Flagged** | **Field Service Observations** |
| Wind | 11/4/13 | WDIR erratic | Lost at sea |

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|---|---|
| **Buoy Site:** 0 165E REFRESH/CO2 | **Mooring Depth:** 4410 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM103 |
| **Deployed Location:** 00-01.388N 165-01.550E | **Deployed Date:** 10/27/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|
| **Buoy Site:** 0 165E ADCP | |
| **Mooring Operation:** Recovery | **Mooring ID#:** WA013 |
| **Deployed Location:** 00-00.96916 165-13.603E | **Deployed Date:** 8/15/13 |
| **Recovered Location:** 00-00.9N 165-13.6E | **Recovered Date:** 10/28/14 |
| **Previous Repair Date:** NA | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged/Fouled:** None | |
| **Fishing/Vandalism:** None | |
| **Sensors/Tubes Downloaded:** None. | |
| **General Comments:** None | |

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|---|---|
| **Buoy Site:** 0 165E ADCP | **Mooring Depth:** 4396 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** WA014 |
| **Deployed Location:** 00-00.95N 165-13.23E | **Deployed Date:** 10/28/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment | |

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|---|---|
| **Buoy Site:** 2N 165E REFRESH | |
| **Mooring Operation:** Recovery | **Mooring ID#:** DM054 |
| **Deployed Location:** 02-00.14N 165-08.6E | **Deployed Date:** 8/14/13 |

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|---|---|
| **Recovered Location:** 02-00.14N 165-08.6E | **Recovered Date:** 10/28/14 |
| **Previous Repair Date:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged/Fouled:** ATRH damaged, SSC and T25 fouled. | |
| **Fishing/Vandalism:** None | |
| **Sensors/Tubes Downloaded:** None. | |
| **General Comments:** None | |

| Site Sensor Failures | Date Data Flagged | Why Data Flagged | Field Service Observations |
|---|---|---|---|
| RH | 7/22/14 | Data too high | Damaged, Instrument base loose |
| SST, SSC | 8/19/13 | Data missing | Fouled |

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|---|---|
| **Buoy Site:** 2N 165E REFRESH | **Mooring Depth:** 4159 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM104 |
| **Deployed Location:** 02-00.75N 165-07.816E | **Deployed Date:** 10/29/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

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|---|---|
| **Buoy Site:** 5N 165E REFRESH | |
| **Mooring Operation:** Recovery | **Mooring ID#:** DM053 |
| **Deployed Location:** 05-06.075N 164-54.110 E | **Deployed Date:** 8/13/13 |
| **Recovered Location:** 05-06.075N 164-54.110 E | **Recovered Date:** 10/29/14 |
| **Previous Repair Date:** None | |
| **Sensors/Equipment Lost at Sea:** T125 lost at sea | |
| **Sensors Damaged/Fouled:** None | |
| **Fishing/Vandalism:** Small amount of leader line wrapped around bridle and SSC | |
| **Sensors/Tubes Downloaded:** None. | |
| **General Comments:** None | |

| Site Sensor Failures | Date Data Flagged | Why Data Flagged | Field Service Observations |
|---|---|---|---|
| RH | 1/24/14 | Data too high | None |
| T125 | 8/29/14 | Data missing | Lost at sea |

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|---|---|
| **Buoy Site:** 5N 165E REFRESH | **Mooring Depth:** 4762 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM105 |
| **Deployed Location:** 05-03.265N 164-51.841E | **Deployed Date:** 10/30/14 |

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| **Pre-Deployment On Deck Instrument Failures:** None |
| **Sensors/Equipment Lost at Sea:** None |
| **Sensors Damaged During Deployment:** None |
| **General Comments:** Routine deployment. |

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|---|---|
| **Buoy Site:** 8N 165E REFRESH | |
| **Mooring Operation:** Recovery | **Mooring ID#:** DM052 |
| **Deployed Location:** 08-03.23N 165-08.6 E | **Deployed Date:** 8/11/13 |
| **Recovered Location:** 08-03.23N 165-08.6 E | **Recovered Date:** 10/30/14 |
| **Previous Repair Date:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged/Fouled:** SSC, T100 | |
| **Fishing/Vandalism:** Small amount of longline gear on mooring | |
| **Sensors/Tubes Downloaded:** None. | |
| **General Comments:** None | |

| Site Sensor Failures | Date Data Flagged | Why Data Flagged | Field Service Observations |
|---|---|---|---|
| RH | 1/17/14 | Data too high | None |

| | |
|---|---|
| **Buoy Site:** 8N 165E REFRESH | **Mooring Depth:** 5213 m |
| **Mooring Operation:** Deployment | **Mooring ID#:** DM106 |
| **Deployed Location:** 08-03.183N 165-08.536E | **Deployed Date:** 10/30/14 |
| **Pre-Deployment On Deck Instrument Failures:** None | |
| **Sensors/Equipment Lost at Sea:** None | |
| **Sensors Damaged During Deployment:** None | |
| **General Comments:** Routine deployment. | |

## 2.2 *CTD Casts Completed*

A Sea-Bird 911plus CTD with dual temperature and conductivity sensors was provided by the NMAO. Temperature and conductivity sensors are calibrated yearly at Sea-Bird and sent in for diagnostics as necessary.

The following outlines the CTD casts completed during the cruise:

| CTD Operations | | | |
|---|---|---|---|
| **Coordinates** | **Date** | **Cast #** | **Comments** |
| 08 00.24N 124 58.60W | 9/2/14 | RB14040011 | |
| 06 59.99N 124 58.53W | 9/3/14 | RB14040021 | |

| | | | |
|---|---|---|---|
| 06 00.05N 124 57.67W | 9/3/14 | RB14040031 | |
| 05 05.83N 124 57.92W | 9/4/14 | RB14040041 | |
| 03 59.97N 124 58.06W | 9/4/14 | RB14040051 | |
| 03 00.02N 124 59.06W | 9/4/14 | RB14040061 | |
| 01 58.86N 125 02.85W | 9/5/14 | RB14040071 | |
| 00 59.87N 124 41.52W | 9/5/14 | RB14040081 | |
| 00 07.90N 124 24.37W | 9/6/14 | RB14040091 | |
| 01 00.10S 124 35.50W | 9/7/14 | RB14040101 | |
| 01 57.70S 124 35.50W | 9/7/14 | RB14040111 | |
| 02 59.99S 124 54.34W | 9/8/14 | RB14040121 | |
| 04 00.12S 124 54.27W | 9/8/14 | RB14040131 | |
| 05 00.93S 124 53.32W | 9/8/14 | RB14040141 | |
| 05 59.89S 124 56.70W | 9/9/14 | RB14040151 | |
| 06 59.89S 124 58.25W | 9/9/14 | RB14040161 | |
| 07 59.81S 124 59.69W | 9/9/14 | RB14040171 | |
| 05 02.60S 139 54.23W | 9/13/14 | RB14040181 | |
| 04 00.02S 139 56.85W | 9/14/14 | RB14040191 | |
| 03 00.05S 139 58.77W | 9/14/14 | RB14040201 | |
| 02 03.32S 139 59.61W | 9/14/14 | RB14040211 | |
| 01 00.21S 140 13.33W | 9/15/14 | RB14040221 | |
| 00 00.42S 140 02.31W | 9/15/14 | RB14040231 | |
| 00 59.91N 140 00.41W | 9/16/14 | RB14040241 | |
| 01 59.00N 140 01.27W | 9/16/14 | RB14040251 | |
| 03 00.03N 139 59.85W | 9/16/14 | RB14040261 | |
| 04 00.04N 139 58.46W | 9/17/14 | RB14040271 | |
| 04 59.20N 139 58.24W | 9/17/14 | RB14040281 | |
| 8 59.00S 140 01.80W | 9/21/14 | RB14040291 | |

## 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

Ten (10) 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:


Gregory Johnson, NOAA/PMEL
Tel: (206) 526-6806
E-mail: pmel_floats@noaa.gov

or

Elizabeth Steffen, NOAA/PMEL
Tel: (206) 526-6747
E-mail: pmel_floats@noaa.gov

The following outlines the Argo floats deployed during the cruise:

| ARGO Floats | | | |
|---|---|---|---|
| **Coordinates** | **Date** | **SN#** | **Comments** |
| 06 21.10N 125 02.73W | 9/2/14 | F0213 | |
| 05 04.20N 124 54.90W | 9/3/14 | F0199 | |
| 00 10.66S 124 22.68W | 9/6/14 | F0238 | |
| 02 04.15S 124 54.78W | 9/7/14 | F0237 | |
| 05 02.17S 124 55.07W | 9/8/14 | F0239 | |
| 05 00.31S 139 55.02W | 9/13/14 | F0235 | |
| 02 03.69S 140 02.64W | 9/14/14 | F0254 | |
| 00 02.20N 139 59.48W | 9/16/14 | F0255 | |
| 01 59.38N 140 01.35W | 9/16/14 | F0258 | |
| 04 59.87N 139 57.81W | 9/17/14 | F0256 | |

Atlantic Oceanographic and Meteorological Laboratory (AMOL) Surface Drifting Floats

Twenty (20) AOML Surface Drifters 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 AOML Surface Drifter deployments were completed as scheduled.

Questions concerning AOML Surface Drifters should be directed to:

Shaun Dolk, NOAA/AOML
Global Drifter Center,
Tel: (305) 361‑4546
Fax: (305) 361‑4436
E-mail: shaun.dolk@noaa.gov

The following outlines the AOML Drifting floats deployed during this cruise:

| AOML Floats | | | |
|---|---|---|---|
| **Coordinates** | **Date** | **SN#** | **Comments** |
| 06 21.10N 125 02.73W | 9/2/14 | 127384 | |
| 06 21.10N 125 02.73W | 9/2/14 | 127385 | |
| 03 59.34N 124 58.197W | 9/4/14 | 127388 | |
| 00 10.66S 124 22.68W | 9/6/14 | 127383 | |
| 00 10.66S 124 22.68W | 9/6/14 | 127386 | |
| 02 03.79S 124 54.78W | 9/7/14 | 127332 | |
| 02 03.79S 124 54.78W | 9/7/14 | 127382 | |
| 04 00.99S 124 54.20W | 9/8/14 | 127328 | |
| 04 00.99S 124 54.20W | 9/8/14 | 127330 | |

| | | | |
|---|---|---|---|
| 03 59.50S 140 56.87W | 9/14/14 | 127329 | |
| 03 59.50S 140 56.87W | 9/14/14 | 116234 | |
| 02 03.69S 140 02.64W | 9/14/14 | 116235 | |
| 02 03.69S 140 02.64W | 9/14/14 | 116233 | |
| 00 02.20N 139 59.48W | 9/16/14 | 116232 | |
| 00 02.20N 139 59.48W | 9/16/14 | 116236 | |
| 01 59.38N 140 01.35W | 9/16/14 | 116231 | |
| 01 59.38N 140 01.35W | 9/16/14 | 127391 | |
| 04 01.29N 139 13.97W | 9/17/14 | 127389 | |
| 01 01.98S 140 26.88W | 9/17/14 | 116230 | |
| 01 01.93S 140 58.30W | 9/17/14 | 127390 | |