TROPICAL ATMOSPHERE-OCEAN (TAO) PROGRAM
FINAL CRUISE REPORT
KA-10-03

Area: Equatorial Pacific between 9°N and 5°S latitude along 140°W Longitude and 8°S to 8°N Latitude along 125°W Longitude.

Itinerary:
KA-10-02 DEP March 30, 2010, Honolulu, HI
ARR May 1, 2010, San Diego, CA

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 Ship Ka‘imimoana and other ships. The buoys’ deployment lifecycle are up to 18 months to ensure at least one year of data collection can be completed.

TAO Project Points of Contact:

TAO Program Manager
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TAO Operations Manager
Lex LeBlanc
National Data Buoy Center
Building 3203
Stennis Space Center, MS 39529
228-688-7465
Email: lex.leblanc@noaa.gov
TAO Cruise Objective and Plan:
The objective of this cruise was the maintenance of the TAO Array along the 125°W and 140°W meridians.
The scientific complement for the cruise embarked at Honolulu, HI on March 29, 2010. The ship departed on March 30, 2010 and conducted operations as listed in Section 2.1. The ship arrived in San Diego, CA on May 1, 2010.

1.0 PERSONNEL

1.1 CRUISE LEAD AND PARTICIPATING SCIENTISTS:

Cruise Lead: Lex LeBlanc

Participating Scientists:

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Nationality</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lex LeBlanc</td>
<td>M</td>
<td>US</td>
<td>NOAA/NDBC</td>
</tr>
<tr>
<td>William Thompson</td>
<td>M</td>
<td>US</td>
<td>NOAA/NDBC</td>
</tr>
<tr>
<td>Casey Burge</td>
<td>M</td>
<td>US</td>
<td>NOAA/NDBC</td>
</tr>
</tbody>
</table>

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 time in the summary reports is Coordinated Universal Time (UTC):

Cruise Summary

<table>
<thead>
<tr>
<th>Buoy Site: 9N 140W ATLAS</th>
<th>Mooring Depth: 4822m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Repair</td>
<td>Mooring ID#: PM838B</td>
</tr>
<tr>
<td>Deployed Location: 08 59.4N, 140 15.4W</td>
<td>Deployed Date: 8/30/2009</td>
</tr>
<tr>
<td>Visit Location: 09 00.12N, 140 15.66W</td>
<td>Visit Date: 4/5/2010</td>
</tr>
<tr>
<td>Previous Repair Date: None</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: None</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged/Fouled: None</td>
<td></td>
</tr>
<tr>
<td>Fishing/Vandalism: None</td>
<td></td>
</tr>
</tbody>
</table>
**General Comments:** Replaced the rain gauge, the buoy was riding well in the water.

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain Gauge</td>
<td>11/27/09</td>
<td>Erratic data.</td>
<td></td>
</tr>
</tbody>
</table>

**Buoy Site:** 5N 140W, Refresh  
**Mooring Depth:** 4485 m  
**Mooring Operation:** Refresh Deployment  
**Deployed Location:** 05 01.8N, 139 57.0W  
**Deployed Date:** 4/7/2010  
**Pre-Deployment On Deck Instrument Failures:** None  
**Sensors/Equipment Lost at Sea:** None  
**Sensors Damaged During Deployment:** None  
**General Comments:** Routine deployment.

<table>
<thead>
<tr>
<th>Buoy Site: 5N 140W, ATLAS</th>
<th>Mooring Depth: 4483 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Recovery</td>
<td>Mooring ID#: PM783B</td>
</tr>
<tr>
<td>Deployed Location: 04 58.5N, 139 57.5W</td>
<td>Deployed Date: 10/23/2008</td>
</tr>
<tr>
<td>Recovered Location: 04 59.13N, 139 57.18W</td>
<td>Recovered Date: 4/7/2010</td>
</tr>
<tr>
<td>Previous Repair Date: 9/1/2009</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: Sea Surface Conductivity/Temperature sensor, 2 spools nylon and acoustic release</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged/Fouled: None</td>
<td></td>
</tr>
<tr>
<td>Fishing/Vandalism: None</td>
<td></td>
</tr>
<tr>
<td>Sensors/Tubes Downloaded: All sensors successfully downloaded.</td>
<td></td>
</tr>
<tr>
<td>General Comments: Line cutter was used to recover mooring. The buoy was deployed over 520 days and was not transmitting via service Argos when recovered.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buoy</td>
<td>12/22/09</td>
<td>Transmission failure.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 5N 140W, ATLAS</th>
<th>Mooring Depth: 4479 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Deployment</td>
<td>Mooring ID#: PM891A</td>
</tr>
<tr>
<td>Deployed Location: 04 57.8N, 139 57.2W</td>
<td>Deployed Date: 04/08/2010</td>
</tr>
<tr>
<td>Pre-Deployment On Deck Instrument Failures: None.</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: None.</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged During Deployment: None.</td>
<td></td>
</tr>
<tr>
<td>General Comments: Routine deployment.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 2N 140W, ATLAS</th>
<th>Mooring Depth: 4370 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Recovery</td>
<td>Mooring ID#: PM785B</td>
</tr>
<tr>
<td>Deployed Location: 01 58.5N, 140 00.3W</td>
<td>Deployed Date: 10/25/2008</td>
</tr>
<tr>
<td>Recovered Location: 01 58.69N, 140 01.165</td>
<td>Recovered Date: 4/8/2010</td>
</tr>
</tbody>
</table>
**Site Sensor Failures** | **Date Sensors Failed** | **Why Sensors Failed** | **Field Service Observations**
---|---|---|---
Salinity | 12/28/09 | Data drifted too high. | 

| Buoy Site: 2N 140W, ATLAS | Mooring Depth: 4373 m |
| Mooring Operation: Deployment | Mooring ID#: PM892A |
| Deployed Location: 01 58.2N, 140 00.1W | Deployed Date: 04/09/2010 |
| Pre-Deployment On Deck Instrument Failures: None. |
| Sensors/Equipment Lost at Sea: None. |
| Sensors Damaged During Deployment: None. |
| General Comments: Routine deployment. |

| Buoy Site: 0 140W, ATLAS | Mooring Depth: 4352m |
| Mooring Operation: Repair | Mooring ID#: PM843B |
| Deployed Location: 00 00.2S, 139 51.3W | Deployed Date: 9/04/2009 |
| Visit Location: 0 10.43N, 140 8.774W | Visit Date: 4/10/2010 |
| Previous Repair Date: None |
| Sensors/Equipment Lost at Sea: None |
| Sensors Damaged During Deployment: Rain Gauge. |
| Fishing/Vandalism: There were paint scrapes on the buoy’s hull. |
| General Comments: Replaced the rain gauge, replaced the TC5 & TC10 on dive operation. |

| Buoy Site: 0 140W, Refresh | Mooring Depth: 4352 m |
| Mooring Operation: Refresh Deployment | Mooring ID#: DM011A |
| Deployed Location: 00 00.7S, 139 52.9°W | Deployed Date: 4/11/2010 |
| Pre-Deployment On Deck Instrument Failures: None |
| Sensors/Equipment Lost at Sea: None |
| Sensors Damaged During Deployment: None |
| General Comments: Deployed first Refresh Flux site buoy compared well with ships data and 0-140W Legacy buoy. Used Iridium transmits to verify buoy operations and not the RF transmitter. |
**Buoy Site:** 2S 140W, ATLAS  
**Mooring Depth:** 4333 m  
**Mooring Operation:** Recovery  
**Mooring ID#:** PM786a  
**Deployed Location:** 02 02.15S, 140 00.3W  
**Deployed Date:** 10/28/2008  
**Recovered Location:** 02 01.9S, 140 01.0W  
**Recovered Date:** 4/11/2010  
**Previous Repair Date:** None  
**Sensors/Equipment Lost at Sea:** Rain gauge, T120, T140, T180, TP300, and TP500  
**Sensors Damaged/Fouled:** AT/RH damaged on recovery  
**Fishing/Vandalism:** Long line gear was recovered on the buoy, cuts were in the Nilspin  
**Sensors/Tubes Downloaded:** All sensors were downloaded successfully with the exception of T20 – no communications.  
**General Comments:** The release didn’t communicate with the deck set. A line cutter was used, however, after one hour it failed to release. The Nilspin was then cut, losing the bottom two TP sensors and 6 spools of nylon.  

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rain Gauge</td>
<td>10/25/09</td>
<td>Data stuck.</td>
<td></td>
</tr>
</tbody>
</table>

**Buoy Site:** 2S 140W, ATLAS  
**Mooring Depth:** 4331 m  
**Mooring Operation:** Deployment  
**Mooring ID#:** PM893A  
**Deployed Location:** 02 2.0S, 139 59.8W  
**Deployed Date:** 04/12/2010  
**Pre-Deployment On Deck Instrument Failures:** None.  
**Sensors/Equipment Lost at Sea:** None.  
**Sensors Damaged During Deployment:** None.  
**General Comments:** Routine deployment.  

**Buoy Site:** 5S 140W, ATLAS  
**Mooring Depth:** 4235m  
**Mooring Operation:** Visit  
**Mooring ID#:** PM845A  
**Deployed Location:** 05 00.1S, 139 54.1W  
**Deployed Date:** 9/6/2009  
**Visit Location:** 04 59.94S, 139 55.29W  
**Visit Date:** 4/12/2010  
**Previous Repair Date:** None  
**Sensors/Equipment Lost at Sea:** None  
**Sensors Damaged/Fouled:** None.  
**Fishing/Vandalism:** None  
**General Comments:** Visit only. Buoy riding well in the water.  

**Buoy Site:** 5S-140W REFRESH  
**Mooring Depth:** 4362m  
**Mooring Operation:** Repair  
**Mooring ID#:** DM005B  
**Deployed Location:** 04 57.8S, 139 54.2W  
**Deployed Date:** 9/05/2009  
**Visit Location:** 04 57.59S, 139 55.79W  
**Visit Date:** 4/12/2010
**Previous Repair Date:** None  
**Sensors/Equipment Lost at Sea:** None  
**Sensors Damaged/Fouled:** AT/RH Replaced to correct high RH reading.  
**Fishing/Vandalism:** None  
**General Comments:** Buoy was riding well in water, and compared with ship’s data and nearby Legacy buoy.

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Humidity</td>
<td>11/2/09</td>
<td>Data too high.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 8.5S 125W, Tsunami Buoy &amp; BPR</th>
<th>Mooring Depth: 4450 m</th>
<th>Mooring Operation: Recovery Buoy and BPR</th>
<th>Mooring ID#: 51406</th>
<th>Deployed Location Buoy 08° 29’ 04” S 125° 01’ 11” W BPR 08° 29’ 18” S 125° 01’ 08” W</th>
<th>Deployed Date: 18 May 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recovered Location: 08 29.07S, 125 01.183W</td>
<td>Recovered Date: 4/16/2010</td>
<td>Previous Repair Date: None</td>
<td>Sensors/Equipment Lost at Sea: None</td>
<td>Sensors Damaged/Fouled: None</td>
<td>Fishing/Vandalism: None</td>
</tr>
<tr>
<td>Sensors/Tubes Downloaded: Down loaded as per DART field service plan</td>
<td>General Comments: Upper shackle missing cotter pin, 2nd shackle corroded, water inside the buoy, one of the transducers plug was damaged. The buoy’s anodes were 100% consumed on recovery.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 8.5S 125W, Tsunami Buoy &amp; BPR</th>
<th>Mooring Depth: 4450 m</th>
<th>Mooring Operation: Deployment, Tsunami Buoy &amp; BPR</th>
<th>Mooring ID#: 51406</th>
<th>Deployed Location: Buoy 08 28.82S, 125 01.608W BPR 08 28.72S, 125 01.732W</th>
<th>Deployed Date: 04/17/2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buoy Site: 8S 125W ATLAS</td>
<td>Mooring Depth: 4498 m</td>
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<td></td>
</tr>
<tr>
<td>Mooring Operation: Recovery</td>
<td>Mooring ID#: PM789A</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deployed Location: 07 59.4S, 124 57.8W</td>
<td>Deployed Date: 11/8/2008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovered Location: 07 59.21S, 124 57.82W</td>
<td>Recovered Date: 4/18/2010</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous Repair Date: None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: T180</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sensors Damaged/Fouled: SSC, T20, T40, T60 fouled.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Fishing/Vandalism: None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensors/Tubes Not Downloaded: All sensors successfully downloaded with the exception of lost T180, sensor and TP300 – dead batteries.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Comments: Hybrid release failed lost 3 spools of nylon and the acoustic release.</td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 8S 125W, ATLAS</th>
<th>Mooring Depth: 4511 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Deployment</td>
<td>Mooring ID#: PM894A</td>
</tr>
<tr>
<td>Deployed Location: 07 59.8S, 124 58.8W</td>
<td>Deployed Date: 4/19/2010</td>
</tr>
<tr>
<td>Pre-Deployment On Deck Instrument Failures: None.</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: None.</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged During Deployment: None.</td>
<td></td>
</tr>
<tr>
<td>General Comments: None</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 5S 125W, ATLAS</th>
<th>Mooring Depth: 4543m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Visit</td>
<td>Mooring ID#: PM847A</td>
</tr>
<tr>
<td>Deployed Location: 04 59.7S, 124 55.5W</td>
<td>Deployed Date: 9/11/2009</td>
</tr>
<tr>
<td>Visit Location: 04 59.3S, 124 56.6W</td>
<td>Visit Date: 4/19/2010</td>
</tr>
<tr>
<td>Previous Repair Date: None</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: None</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged/Fouled: None.</td>
<td></td>
</tr>
<tr>
<td>Fishing/Vandalism: None</td>
<td></td>
</tr>
<tr>
<td>General Comments: Visit only. Buoy riding well in the water.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Buoy Site: 2S 125W, ATLAS</th>
<th>Mooring Depth: 4757m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mooring Operation: Repair</td>
<td>Mooring ID#: PM848B</td>
</tr>
<tr>
<td>Deployed Location: 02 02.3S, 124 53.5W</td>
<td>Deployed Date: 9/12/2009</td>
</tr>
<tr>
<td>Visit Location: 02 01.9S, 124 54.5W</td>
<td>Visit Date: 4/20/2010</td>
</tr>
<tr>
<td>Previous Repair Date: None</td>
<td></td>
</tr>
<tr>
<td>Sensors/Equipment Lost at Sea: None</td>
<td></td>
</tr>
<tr>
<td>Sensors Damaged/Fouled: None.</td>
<td></td>
</tr>
<tr>
<td>Fishing/Vandalism: None</td>
<td></td>
</tr>
</tbody>
</table>
**General Comments:** Dive op to replace SSC sensor.

<table>
<thead>
<tr>
<th>Site Sensor Failures</th>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SST</td>
<td>2/11/10</td>
<td>Erratic and missing data.</td>
<td></td>
</tr>
</tbody>
</table>

**Buoy Site:** 0 125W ATLAS
**Mooring Depth:** 4763 m
**Mooring Operation:** Recovery
**Mooring ID#:** PM790B
**Deployed Location:** 00 10.75S, 124 23.5W
**Deployed Date:** 11/12/2008
**Recovered Location:** None
**Recovered Date:** None
**Previous Repair Date:** 9/13/2009

**Sensors/Equipment Lost at Sea:** All equipment lost at sea, buoy not on station.
**Sensors Damaged/Fouled:** N/A
**Fishing/Vandalism:** None
**Sensors/Tubes Not Downloaded:** All equipment lost at sea.

**General Comments:** Acoustic release was horizontal, and 4 miles from deployment location.

<table>
<thead>
<tr>
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<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salinity</td>
<td>10/19/09</td>
<td>Data too low.</td>
<td></td>
</tr>
<tr>
<td>Buoy</td>
<td>10/22/09</td>
<td>Transmission failure.</td>
<td>Horizontal release</td>
</tr>
</tbody>
</table>

**Buoy Site:** 0 125W ATLAS
**Mooring Depth:** 4787 m
**Mooring Operation:** Deployment
**Mooring ID#:** PM895A
**Deployed Location:** 00 11.09S, 124 23.59W
**Deployed Date:** 4/21/2010
**Pre-Deployment On Deck Instrument Failures:** None.

**Sensors/Equipment Lost at Sea:** None.
**Sensors Damaged During Deployment:** None.

**General Comments:** Refurbished DART release from BPR, ran out of fairings.

**Buoy Site:** 2N 125W, ATLAS
**Mooring Depth:** 4709 m
**Mooring Operation:** Visit
**Mooring ID#:** PM851A
**Deployed Location:** 01 57.8N, 125 02.9W
**Deployed Date:** 9/15/2009
**Visit Location:** 01 58.204N, 125 04.220W
**Visit Date:** 4/22/2010
**Previous Repair Date:** None

**Sensors/Equipment Lost at Sea:** None
**Sensors Damaged/Fouled:** None
**Fishing/Vandalism:** None

**General Comments:** Visit only. Buoy riding well in the water.

**Buoy Site:** 5N 125W ATLAS
**Mooring Depth:** 4373 m
**Mooring Operation:** Recovery
**Mooring ID#:** PM852A
### General Comments:

- **Deployed Location:** 05 04.9N 124 52.7W
- **Deployed Date:** 9/16/2009
- **Recovered Location:** 05 05.192N 124 52.402W
- **Recovered Date:** 4/23/2010
- **Previous Repair Date:** None
- **Sensors/Equipment Lost at Sea:** None
- **Sensors Damaged/Fouled:** N/A
- **Fishing/Vandalism:** None
- **Sensors/Tubes Not Downloaded:** All sensors downloaded successfully except T14773 – no communications.
- **General Comments:** One spool of nylon has a strand cut.

#### Site Sensor Failures

<table>
<thead>
<tr>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mooring Details

- **Buoy Site:** 5N 125W, ATLAS
- **Mooring Depth:** 4404 m
- **Mooring Operation:** Deployment
- **Mooring ID#:** PM896A
- **Deployed Location:** 05 04.450N, 124 56.651W
- **Deployed Date:** 4/23/2010
- **Pre-Deployment On Deck Instrument Failures:** None
- **Sensors/Equipment Lost at Sea:** None
- **Sensors Damaged During Deployment:** Wind sensor 70 degrees from ship observations
- **General Comments:** Replaced the wind sensor after deployment. Due to limits in available nylon we deployed with a butt splice in the #3 spool approximately 100m from the end of the spool.

### Additional Details

- **Mooring Operation:** Recovery DART (adrift)
- **Mooring ID#:** 43413
- **Deployed Location:** 10 50.4N, 100 5.1W
- **Deployed Date:** 10/20/2009
- **Recovered Location:** 07 11.68N, 122 28.92W
- **Recovered Date:** 04/24/2010
- **Previous Repair Date:** None
- **Sensors/Equipment Lost at Sea:** None
- **Sensors Damaged/Fouled:** N/A
- **Fishing/Vandalism:** None
- **Sensors/Tubes Not Downloaded:** N/A
- **General Comments:** Mooring failed in first shackle of lower Nilspin

#### Site Sensor Failures

<table>
<thead>
<tr>
<th>Date Sensors Failed</th>
<th>Why Sensors Failed</th>
<th>Field Service Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/12/2010</td>
<td>Buoy adrift</td>
<td></td>
</tr>
</tbody>
</table>
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. A Sea-Bird 12-position carousel and twelve 5-liter Niskin bottles were used to collect water samples for the analysis of salinity.

The following outlines the CTD casts completed during the cruise:

<table>
<thead>
<tr>
<th>Coordinates</th>
<th>Date</th>
<th>Cast #</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 58.997N 140 16.263W</td>
<td>4/3/10</td>
<td>None</td>
<td>Test cast, 1000 m</td>
</tr>
<tr>
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<td>4/5/10</td>
<td>KA30011</td>
<td>3000 m</td>
</tr>
<tr>
<td>08 01.355N 140 10.346W</td>
<td>4/6/10</td>
<td>KA30021</td>
<td>1000 m</td>
</tr>
<tr>
<td>07 00.531N 140 05.650W</td>
<td>4/6/10</td>
<td>KA30031</td>
<td>1000 m</td>
</tr>
<tr>
<td>06 00.062N 140 02.270W</td>
<td>4/6/10</td>
<td>KA30041</td>
<td>1000 m</td>
</tr>
<tr>
<td>04 58.086N 140 04.455W</td>
<td>4/7/10</td>
<td>KA30051</td>
<td>1000 m</td>
</tr>
<tr>
<td>04 00.028N 140 00.614W</td>
<td>4/8/10</td>
<td>KA30061</td>
<td>1000 m</td>
</tr>
<tr>
<td>03 00.603N 140 00.193W</td>
<td>4/8/10</td>
<td>KA30071</td>
<td>1000 m</td>
</tr>
<tr>
<td>01 59.020N 140 01.101W</td>
<td>4/9/10</td>
<td>KA30082</td>
<td>1000 m</td>
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<tr>
<td>01 00.911N 140 06.292W</td>
<td>4/10/10</td>
<td>KA30091</td>
<td>1000 m</td>
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<tr>
<td>00 12.968N 140 08.824W</td>
<td>4/10/10</td>
<td>KA30101</td>
<td>3000 m</td>
</tr>
<tr>
<td>00 13.614N 140 08.404W</td>
<td>4/10/10</td>
<td>KA30111</td>
<td>1000 m</td>
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<tr>
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<tr>
<td>02 03.445S 140 00.428W</td>
<td>4/12/10</td>
<td>KA30131</td>
<td>1000 m</td>
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<tr>
<td>02 59.644S 140 00.183W</td>
<td>4/12/10</td>
<td>KA30141</td>
<td>1000 m</td>
</tr>
<tr>
<td>03 59.341S 139 57.600W</td>
<td>4/12/10</td>
<td>KA30151</td>
<td>1000 m</td>
</tr>
<tr>
<td>04 59.517S 139 56.904W</td>
<td>4/13/10</td>
<td>KA30161</td>
<td>1000 m</td>
</tr>
<tr>
<td>07 58.801S 125 02.734W</td>
<td>4/18/10</td>
<td>KA30171</td>
<td>1000 m</td>
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<tr>
<td>06 59.735S 124 57.929W</td>
<td>4/19/10</td>
<td>KA30181</td>
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<tr>
<td>05 59.558S 124 57.659W</td>
<td>4/19/10</td>
<td>KA30191</td>
<td>1000 m</td>
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<tr>
<td>04 57.970S 124 57.093W</td>
<td>4/19/10</td>
<td>KA30201</td>
<td>1000 m</td>
</tr>
<tr>
<td>04 00.014S 124 56.541W</td>
<td>4/20/10</td>
<td>KA30212</td>
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<tr>
<td>03 00.308S 124 55.734W</td>
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<td>KA30221</td>
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<tr>
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<td>KA30241</td>
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<td>KA30261</td>
<td>1000 m</td>
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<tr>
<td>01 00.888N 124 47.843W</td>
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<td>KA30271</td>
<td>1000 m</td>
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<td>4/22/10</td>
<td>KA30281</td>
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<tr>
<td>02 57.532N 125 00.397W</td>
<td>4/22/10</td>
<td>KA30291</td>
<td>1000 m</td>
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<tr>
<td>04 00.569N 124 55.379W</td>
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<td>KA30301</td>
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<tr>
<td>05 04.494N 124 49.761W</td>
<td>4/23/10</td>
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</tr>
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<td>05 58.508N 123 53.179W</td>
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<td>KA30321</td>
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<tr>
<td>07 00.334N 122 40.548W</td>
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</tbody>
</table>
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

Six 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 or Elizabeth Steffen, NOAA/PMEL
Tel: (206) 526-6806 or Tel: (206) 526-6747
E-mail: pmel_floats@noaa.gov or E-mail: pmel_floats@noaa.gov

The following outlines the Argo floats deployed during the cruise:

<table>
<thead>
<tr>
<th>Coordinates</th>
<th>Date</th>
<th>SN#</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
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<td>124 57.462W</td>
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<tr>
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<td>124 55.001W</td>
<td>4/20/2010</td>
<td>90553</td>
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<tr>
<td>00 10.691S</td>
<td>124 23.553W</td>
<td>4/21/2010</td>
<td>90551</td>
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<td>01 58.204N</td>
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<tr>
<td>05 04.678N</td>
<td>124 56.296W</td>
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<td>90550</td>
</tr>
</tbody>
</table>

Atlantic Oceanographic and Meteorological Laboratory (AMOL) Surface Drifting Floats

Five 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

<table>
<thead>
<tr>
<th>Coordinates</th>
<th>Date</th>
<th>SN#</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 57.376N</td>
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<tr>
<td>01 42.419N</td>
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<tr>
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<td>90547</td>
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<tr>
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<tr>
<td>02 03.364S</td>
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