Second Year of the Atlantic Data Buoys Comparison Study (ADB 2006)

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Second Year Atlantic Data Buoys Study

• The Global Drifter Program continued the 2005 comparison study of SVP drifters built with the mini drogue. This study is called Atlantic Data Buoys (ADB).

• The SVP drifters with mini drogue were deployed as clusters in open ocean regions of the Atlantic Ocean.

• As done last year, each cluster consisted of four drifters, one from each manufacturer: Clearwater, Metocean, Pacific Gyre, Technocean.

• Drifters were activated before deployment, deployed in close proximity and within minutes of each other.

• Eight clusters of ADB drifters were deployed in the Atlantic Ocean in 2006.
Cluster 1
Dep: Mar 16, 2006

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre
Cluster 2
Dep: Jun 13, 2006

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre
Cluster 3
Dep: Jun 23, 2006

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre

Drogue

SST
Cluster 4
Dep: June 28, 2006

Twin tracks
Picked Up
(P.U)

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre

SST bad at time they were picked up
Deployment of Cluster 5 by AOML drifter group

Miss Britt

Drifters handled with care

Magnets removed

Listening for signal

Drifter in water
Cluster 5
Dep: Jun 29, 2006

Crossed edge of Gulfstream and entered the cold Labrador/Shelf waters

Died

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre

Drogue

SST
Cluster 7
Dep: July 25, 2006

Dead
10 day gap

-- Clearwater
-- Technocean
-- Metocean
-- Pacific Gyre

Drogue

SST
We concluded that Metocean & PacGyre drifters were picked up, then redeployed. Metocean drifter may have been damaged, because no more positions were obtained, even after placing the buoy in ALP.
### Number of Transmissions Per Day Location Classes

- Argos locations are calculated from all messages received during a satellite pass over a transmitter.
- Standard locations are calculated on reception of four or more messages.
- Auxiliary Location Processing (ALP) also receive locations calculated from two (A) or three messages (B).
- Each location is assigned to a location class. The classes vary according to the estimated accuracy of the location, for standard locations.

(from the Argos User’s manual)
• Pacific Gyre has the most class 3 locations in several clusters (# 2, 4, 7, 8)

• Technocean has the least # of class 0’s in all clusters, with more class 2-3 (most class 3’s in clusters 1, 3, 5).

• Clearwater has slightly higher class 0 LC in all clusters except cluster 2.

<table>
<thead>
<tr>
<th>Class</th>
<th>Estimated Accuracy in latitude and longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>&lt; 150 m</td>
</tr>
<tr>
<td>2</td>
<td>150 m &lt;= accuracy &lt; 350 m</td>
</tr>
<tr>
<td>1</td>
<td>350 m &lt;= accuracy &lt;1000 m</td>
</tr>
</tbody>
</table>
Transmitter and drogue life times
ADB2006

Cluster number

2006

Mar Apr May Jun Jul Aug Sep Oct

Pacific Gyre
Metocean
Technocean
Clearwater

P.U
Quit
# Summary Table of Transmitter’s Life Times

<table>
<thead>
<tr>
<th>Manufacturers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearwater</td>
<td>*</td>
<td>72 (Quit)</td>
<td>*</td>
<td>73 (P.U)</td>
<td>75 (Quit)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Technocean</td>
<td>*</td>
<td>51 (P.U)</td>
<td>*</td>
<td>73 (P.U)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Metocean</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>31 (Quit)</td>
<td>10 (P.U)</td>
</tr>
<tr>
<td>Pacific Gyre</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>70 (Quit)</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

| Max # Days | 189 | 99 | 90 | 85 | 83 | 65 | 57 | 45 |

* OK until last update, September 21, 2006
# Summary Table of Drogue’s Life Times

<table>
<thead>
<tr>
<th>Manufacturers</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearwater</td>
<td>88</td>
<td>64</td>
<td>*</td>
<td>73* (P.U)</td>
<td>75* (Quit)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Technocean</td>
<td>133</td>
<td>51* (P.U)</td>
<td>*</td>
<td>73* (P.U)</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Metocean</td>
<td>142</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>31* (Quit)</td>
<td>10* (P.U)</td>
<td>*</td>
</tr>
<tr>
<td>Pacific Gyre</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>70* (Quit)</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Max # Days</td>
<td>189</td>
<td>99</td>
<td>90</td>
<td>85</td>
<td>83</td>
<td>65</td>
<td>57</td>
<td>45</td>
</tr>
</tbody>
</table>

* OK until it died or last update, September 21, 2006
Improvements in the 2006 Study
Improvements in packaging, handling and deployment of drifters

• All manufacturers used similar packaging.
• Technocean reverted to wired rope radial design, to extend drogue life.
• Metocean attached deployment instructions directly to surface float.
• Pacific Gyre installed carrying handles.
Improvements in all other areas

• All deployments were successful, *no* drifters failed on deployment.

• Only 4 drifters have quit transmitting as of September 21, 2006.

• Only 4 drifters have lost their drogues before transmitter quit.

• All SSTs from neighboring drifters seem to be consistent with each other.

• Transmission problems have been resolved: only 1 10-day gap found in one drifter, which is not a concern.
Conclusions

This study shows how important communication has been between manufacturers and buoy operators.

Manufacturers responded quickly and diligently to problems found in last year’s study, and fixed them.

We plan to maintain active communication with manufacturers to address any problems that may arise.

No ADB study is planned at this time for 2007.
Thank You
2005 ADB Packaging

Before

Clearwater  Technocean  Pacific Gyre  Metocean

2006 ADB standardized packaging

After

Clearwater  Pacific Gyre  Metocean  Technocean
Deployment of Cluster 5 by AOML drifter group

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Drifters in water