

# Canadian National Report on Argo-2006

## **1. Status of implementation** (Major achievements and problems encountered in 2006)

### 1.1 Floats deployed and their performance

During 2006, Canada deployed 38 floats: all were APEX floats. Of these APEX floats 11 carried Aanderaa Optode sensors. As of writing in February 2007 one float only has failed, all of the rest are supplying good data. We are grateful to Dick Feeley (University of Washington) for allowing us to deploy 8 floats from the Thomas Thompson, and we are grateful to the Canadian navy for deployment of 5 floats. Deployment plans for 2007 have remained uncertain as our inventory of floats declined almost to zero. By the end of March 2007 we will have 24 floats in inventory and are now developing a deployment plan. We welcome deployment opportunities of Canadian floats from other nations.

Although reliability issues with the PROVOR floats have led us to focus on the use of APEX floats for the time being, it is important for that there be multiple sources of floats to allow a necessary healthy competition for this market. We are pleased about a recent offer from Martec/Metocean to replace two aged PROVOR floats in our inventory with 2 of the PNG (PROVOR New Generation) floats. We are anxious to test these in the field.

### 1.2 Status of contributions to Argo data management

MEDS continues to acquire data from 96 active Argo floats and issues data to the GTS and GDACs every 6 hours. On average 80% the data were distributed to the GTS within 24 hours. Our website is updated daily automatically. The website displays float tracks, temperature, salinity and oxygen contour plots and technical information for each float. The website is located at [www.meds-sdmm.dfo-mpo.gc.ca](http://www.meds-sdmm.dfo-mpo.gc.ca). We also monitor the timeliness of Argo data from different data centers on the GTS. We are working with Service Argos to solve the duplications of the Argo messages on the GTS.

We implemented additional quality control tests and changes to the NetCDF file format at GDACs resulting from the 5<sup>th</sup> Argo Data Management Meeting. As a result of the last DMQC workshop, we reprocessed and sent all of the delayed mode data from Canada to the GDACs. We also adjusted the salinity in real-time based on delayed mode QC feedback.

For the upcoming year, we will modify our software to adapt to the file format change at GDACs. We are working with Denis Gilbert on quality control tests for oxygen data. We have completed software to both encode and decode Argo data into and from BUFR. We have carried out testing with Japan to verify the encoding works.

Ron Perkin, our delayed mode data quality specialist has retired. We will be moving this operation to be carried out by Mathieu Ouellet, a physical oceanographer at MEDS, in the near future. Ron has been working with Mathieu to ensure as smooth a transition as possible.

## **2. Present level of, and future prospects for, national funding for Argo including a summary of the level of human resources devoted to Argo.**

During 2006 Canada experienced some difficulties in the continuation of funding, though not as severe as they were in 2005. It is always our hope that funding may eventually be moved to a more routine or operational basis but at the moment we cannot see a route to that objective. The funding in 2006 was adequate to our needs.

Capital funding did become available late in the fiscal year that is allowing us to purchase floats for future launch and an order for 21 units is in place at the time of writing. The financial resources arrived too late in the fiscal year to allow us to order floats with sensors for dissolved oxygen.

## **3. Summary of deployment plans (levels of commitment, areas of float deployment) and other commitments to Argo (data management) for the coming year (and beyond where possible).**

Following the delivery of floats from the current order Canada will have 24 floats available for launch during 2007 and early 2008. This includes one APEX-Optode and 2 PROVOR floats left in the inventory from previous years plus the 21 new APEX floats currently on order. Of these 24 floats, 12 will be available for Atlantic launches and 11 for Pacific launches.

Deployment plans are in the early stages of preparation as we did not know until a couple of weeks ago whether or not instruments would be available for deployment. Nevertheless, it does appear that launches in 2007 will be less than the number of Canadian launches in 2006.

## **4. Summary of national research and operational uses of Argo data.**

### **a) Pacific Ocean**

We have developed systems to enable us to monitor the changing conditions in the N.E. Pacific Ocean. The information gathered is now an essential component of formal annual reporting on the state of the ocean. The information used in this formal report is subsequently used for fisheries management etc. Information is also used extensively by the Canadian military. Research is being conducted to develop Ocean data Assimilation modelling capabilities in the Pacific. This research is being funded by the CFCAS (Canadian Foundation for Climate and Atmospheric Science). Many scientists at the Institute of Ocean Sciences and nearby Universities are learning about Argo and developing research activities.

### **b) Atlantic Ocean**

Lack of resources remains an obstacle for the systematic exploitation of Argo temperature and salinity data from the northwest Atlantic but we hope to improve on this. Denis Gilbert (IML) continues to explore the use of the Aanderaa Optode oxygen sensor.

c) Global

Personnel at ISDM (formerly MEDS in Ottawa) have implemented an objective analysis module to generate near real-time 3D fields of temperature and salinity. The fields consist mostly of Argo temperature and salinity data and will be provided to the Canadian Ice Service to assist in the operation of a coupled ocean-ice model. The fields will also be used by COMDA (DFO's virtual Centre for Ocean Model Development and Application).

**5. Issues that your country wishes to be considered and resolved by AST regarding the international operation of Argo.** Examples include tasks performed by the AIC, the means of co-ordination of activities at an international level and the performance of the Argo data system. If you have specific comments relating to the agenda items please include them in your national report.

We are concerned about the lag in most countries in the delivery of Argo data that has passed through the delayed-mode quality control process. We believe that this should be done more promptly than currently appears to be happening.

We are very keen to see a permanent Argo program office established and wish to encourage the Argo Executive and IAST to make this happen. We believe that a single program office should be established that will co-locate the ATC and AD positions. This would best be done at a location with other international program offices.

A significant part of the present North Atlantic float coverage came about from time-limited research programs that have now ended. We are concerned about the long-term sustained coverage of the North Atlantic. There needs to be a discussion about mechanisms for ensuring the re-seeding that will be required to sustain the North Atlantic float array.

**Appendix – summary of Canadian float launches during calendar 2006.**

	Launch Date	WMO-ID	Oxygen sensors?	Ocean Basin	Launching Vessel	Still Operating?
1	16-Feb	4900739		p	CCGS Tully	Yes
2	17-Feb	4900740		p	CCGS Tully	Yes
3	17-Mar	4900733		p	Thompson	Yes
4	18-Mar	4900734		p	Thompson	Yes
5	19-Mar	4900741		p	Thompson	Yes
6	21-Mar	4900742		p	Thompson	Yes
7	23-Mar	4900737		p	Thompson	Yes
8	24-Mar	4900738		p	Thompson	Yes
9	26-Mar	4900736		p	Thompson	Yes
10	28-Mar	4900735		p	Thompson	Yes
11	19-May	4900635		a	Hudson	Yes
12	21-May	4900677		a	Hudson	Yes
13	21-May	4900678		a	Hudson	Yes
14	21-May	4900679		a	Hudson	Yes
15	27-May	4900682		a	Hudson	Yes
16	29-May	4900876		a	Hudson	Yes
17	30-May	4900880	Yes	a	Hudson	Yes
18	31-May	4900879	Yes	a	Hudson	Yes
19	29-May	4900876		a	Hudson	Yes
20	01-Jun	4900683		a	Hudson	Yes
21	05-Jul	4900869	Yes	p	Hudson	Yes
22	07-Jul	4900522		p	Laurier	Yes
23	18-Jul	4900871	Yes	p	Tully	Yes
24	19-Jul	4900872	Yes	p	Tully	Yes
25	28-Jul	4900877		a	Templeman	Yes
26	29-Jul	4900628		a	Templeman	Yes
27	03-Aug	4900496		p	HMCS Vancouver	Yes
28	03-Aug	4900503		a	Templeman	Yes
29	04-Aug	4900873	Yes	p	HMCS Vancouver	Yes
30	04-Aug	4900865		p	HMCS Vancouver	No
31	04-Aug	4900866		p	HMCS Vancouver	Yes
32	05-Aug	4900874	Yes	p	HMCS Vancouver	Yes
33	03-Oct	4900868		p	Tully	Yes
34	04-Oct	4900870	Yes	p	Tully	Yes
35	08-Oct	4900878		a	Hudson	Yes
36	11-Oct	4900881	Yes	a	Hudson	Yes
37	14-Oct	4900882	Yes	a	Hudson	Yes
38	27-Nov	4900883	Yes	a	Hudson	Yes