



## **Argo-Poland National Report 2014**

Waldemar Walczowski, Ilona Goszczko  
IO PAN, Sopot, Poland  
April 2015

### **1. The status of implementation**

Institute of Oceanology Polish Academy of Sciences (IOPAN) remains the main Polish representative in the Euro-Argo as well as in the global Argo Programme.

Nevertheless, since 12<sup>th</sup> May, 2014 Poland has had an observer status in the Euro-Argo European Research Infrastructure Consortium (E-A ERIC). Thus, some duties arising from the Polish participation in E-A ERIC will be transferred to the Polish Ministry of Science and Higher Education (MSHE). Poland is obligated to launch at least 2 Argo floats per year and participate in the E-A ERIC Council and Management Board.

The Euro-Argo is on the Polish Roadmap for Research Infrastructures developed by the MSHE. A couple of days of ship-time in the Nordic Sea is devoted to the Argo project. Unfortunately, no resources is designed to personnel beyond the EU Euro-Argo Improvements for the GMES Marine Service (E-AIMS) Project time frame.

In 2014 two Argo floats were purchased, developed and launched in frame of the E-AIMS. In the beginning of 2014 offers from various floats manufacturers were analysed and floats specifications were developed. Due to the financial limitations it was decided to develop and order two different floats: one 'standard' Arctic float and one item with the Inertial Measurements Unit (IMU). Due to the lack of RAFOS sources in the Fram Strait region, the installation of RAFOS receivers was skipped to cut down the costs.

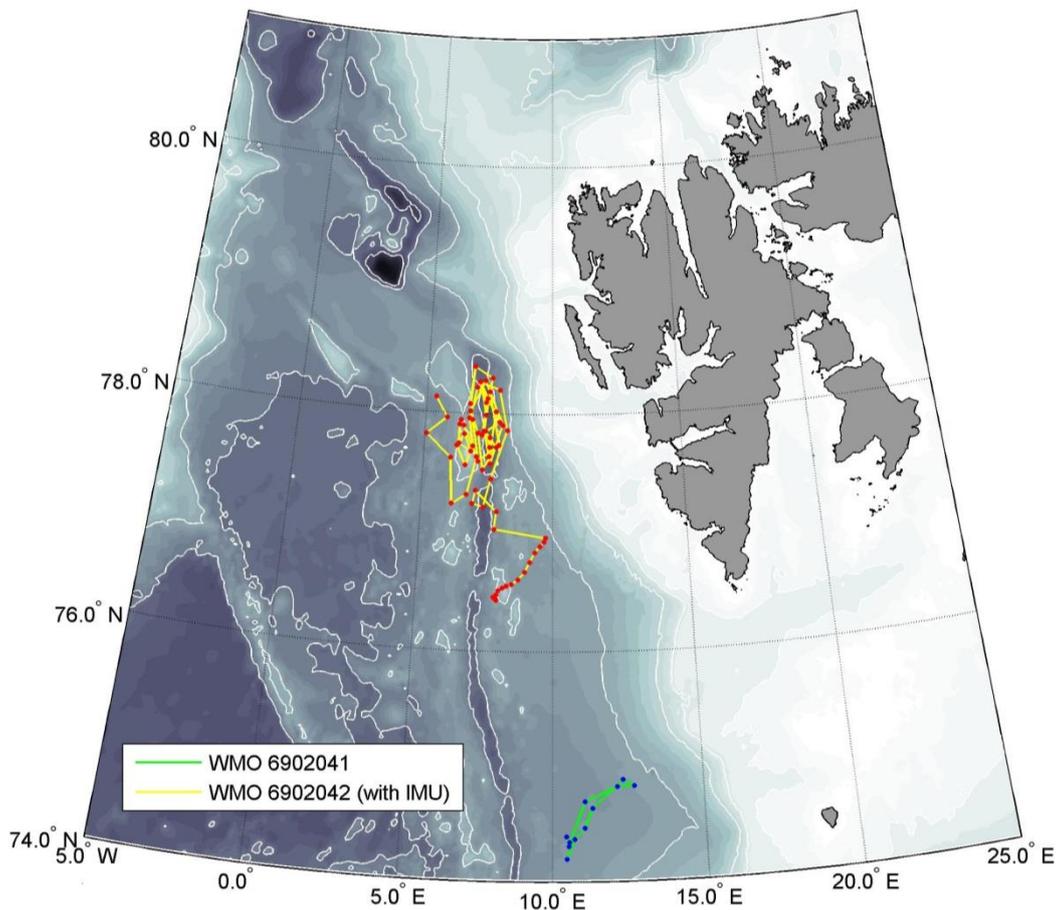
The first IRIDIUM float with Ice Detection Algorithm was delivered by OPTIMARE to IOPAN in May 2014.

In the meantime the concept of a different, more sophisticated float was developed. The idea was to implement the IMU sensor and processor into a float. Three various IMU devices were tested by IOPAN. Various modes of the IMU work were analysed. The negotiations with floats manufacturers to implement the IMU sensor into a float were also conducted. Finally, the OPTIMARE GmbH as the float producer and the FORKOS Ltd. (SME) as the IMU module (IMU sensor, processor, software and data storage module) provider were selected. OPTIMARE agreed to apply necessary changes in their float and install the IMU sensor. The update of the float by installing the IMU sensor was longer and more expensive than planned, but finally operation was successful. The experiment with the IMU sensor was developed. Due to high power consumption (mostly by the data processor) it was decided to switch off the sensor two months after deployment to save batteries for standard float functions.

Both floats were deployed from the IOPAN research vessel ‘Oceania’. The first float was launched on the 1<sup>st</sup> July, 17:20 GMT at the position 75°0.025’N, 012°29.650’E, and got WMO# 6902041. The second float with IMU sensor was deployed at the position 76°29.864’N, 007°32.284’E on the 10<sup>th</sup> July, 20:00 GMT and got WMO# 6902042 (Fig. 1).

Some technical problems were encountered with the first float. The first data package was sent 59 days after deployment, however, the data were incomplete. Eventually, the float sent 10 incomplete sets of data and stopped to transmit on the 9<sup>th</sup> October. All in all, the float did 33 profiles (part of them was not sent).

Deployment of the second, IMU float was successful. By the 18<sup>th</sup> April 2015 the full set of hydrographic data has been transmitted. The IMU data were transmitted as planned for the first 17 days (16 profiles with IMU data were received). Two way communication via IRIDIUM was tested and changes in the float working mode were successful (IMU sensor was stopped). So far, the float has done 69 profiles and it is still working.



*Figure 1. Surfacing position of two Argo floats deployed south and west of Spitsbergen in July 2014. The first (green line) sent incomplete data from 10 profiles while the second (yellow line) has sent data from 69 profiles and 16 datasets from IMU and is still working.*

## **2. Present level of and future prospects for national funding for Argo**

In 2015 IOPAN received a subsidy from the MSHE devoted to the large research infrastructure, in a total amount of ca. €362K. Substantial part of it, ca €200K, is devoted to equipment for the rationalization of the Argo-Poland. The amount of €134K is guaranteed for the Argo floats purchase, while the remaining amount is allocated for other equipment, namely the Iridium Satellite Modem (L-Band transceiver), a computer with high computing power and the Network Attached Storage (NAS).

### 3. Summary of deployment plans

In 2015 IO PAN is going to deploy two floats in the Nordic Seas, this time closer to the south, upstream in the Norwegian Atlantic Current (Fig. 2). The main purpose remains the same, namely tracing the Atlantic water inflow into the subpolar North Atlantic and then to the Arctic Ocean. The floats will be launched during the IOPAN AREX'15 cruise. In addition to that, one float will be launched in the Baltic Sea. Plans of deployments of these floats will be soon added to the AIC coordination system.

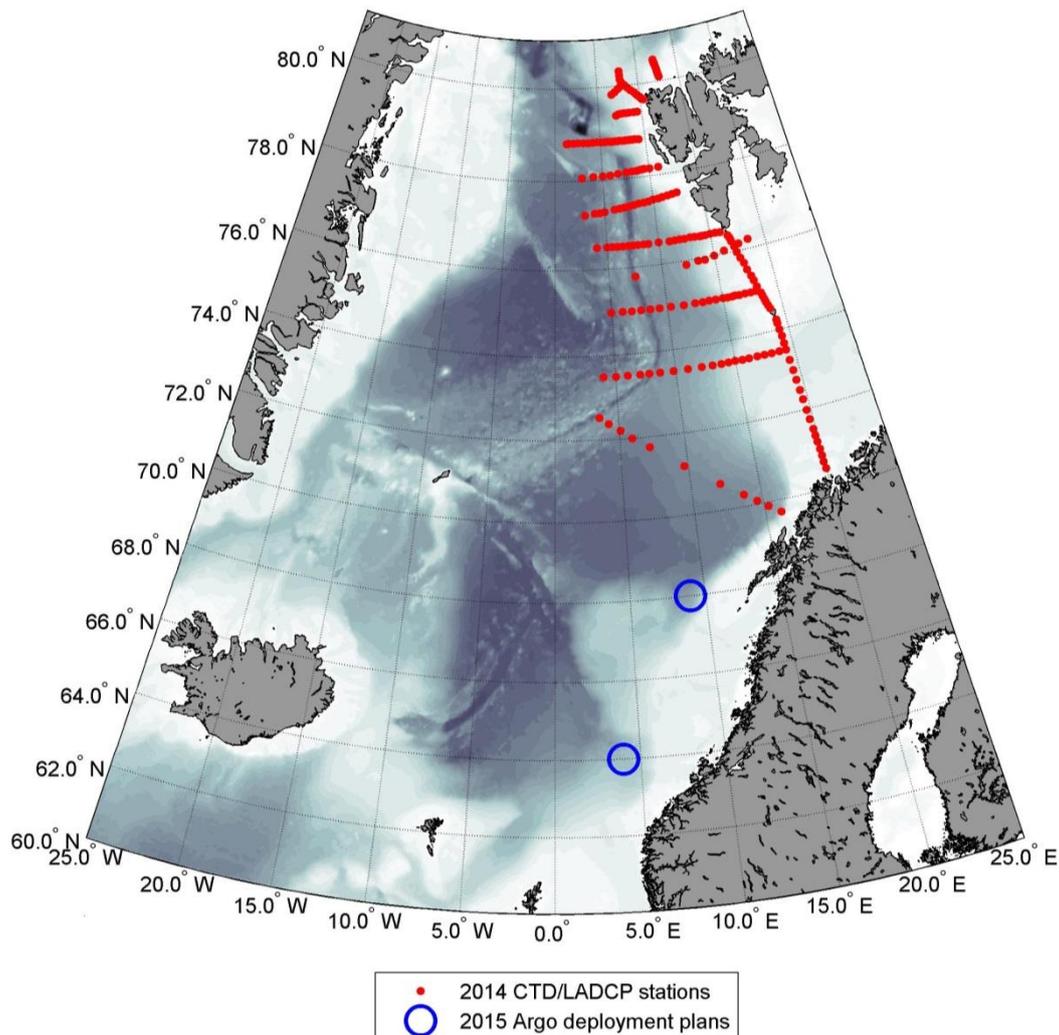


Figure 2. Planned locations of the Argo-Poland deployments in 2015 and CTD stations performed during AREX 2014 cruise of R/V Oceania.

#### **4. Commitments to Argo data management**

The profiles for Polish floats are processed by IOPAN and sent to the Coriolis Center, France. The real-time data processing is performed by the Coriolis Center, as well. Data processing follows the procedures set up by the Argo Data Management Team. In the future the delayed mode QC (DMQC) will be most likely secured by the Bundesamt für Seeschifffahrt und Hydrographie (BSH), Hamburg, Germany.

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

The unique Argo floats trajectories as well as profiles collected west of Svalbard during the late summer, autumn and early winter are being used in the analysis concerning the amount and properties of the Atlantic Water, as well as its transformation in the Greenland Sea. The obtained results will be also used in a nascent PhD thesis comparing data sets received from various sources.

The Argo-Poland website is constantly maintained by the IOPAN:

<http://www.iopan.gda.pl/hydrodynamics/po/Argo/argo.html>

#### **6. The number and location of CTD cruise data uploaded to the CCHDO website in the past year**

Until now all Argo-Poland deployments (in 2009, 2010, 2012 and 2014) have been a part of the IOPAN summer Arctic experiments – AREX during which ca. 200 CTD stations are done each year, including some casts performed just after float launching. However, the data have not been submitted to the CCHDO website yet. It may be done in the future.

#### **7. The Argo bibliography**

There are plans to write some scientific papers concerning the usage of Argo data. Yet, nothing was published last year except some workshop and conference materials. There were no PhD theses using the Argo data completed in the past year in Poland neither.