



Argo-Poland National Report 2022

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1. The status of implementation of the new global, full-depth, multidisciplinary Argo array

a. floats deployed and their performance

At the end of July 2022, during the AREX 2022 summer cruise, Poland launched one float from the board of the Institute of Oceanography Polish Academy of Sciences (IO PAN) vessel *r/v Oceania*. The float (WMO 3902116) was deployed in the Greenland Sea (76.51 °N, 00.92 °E) (Figure 1).

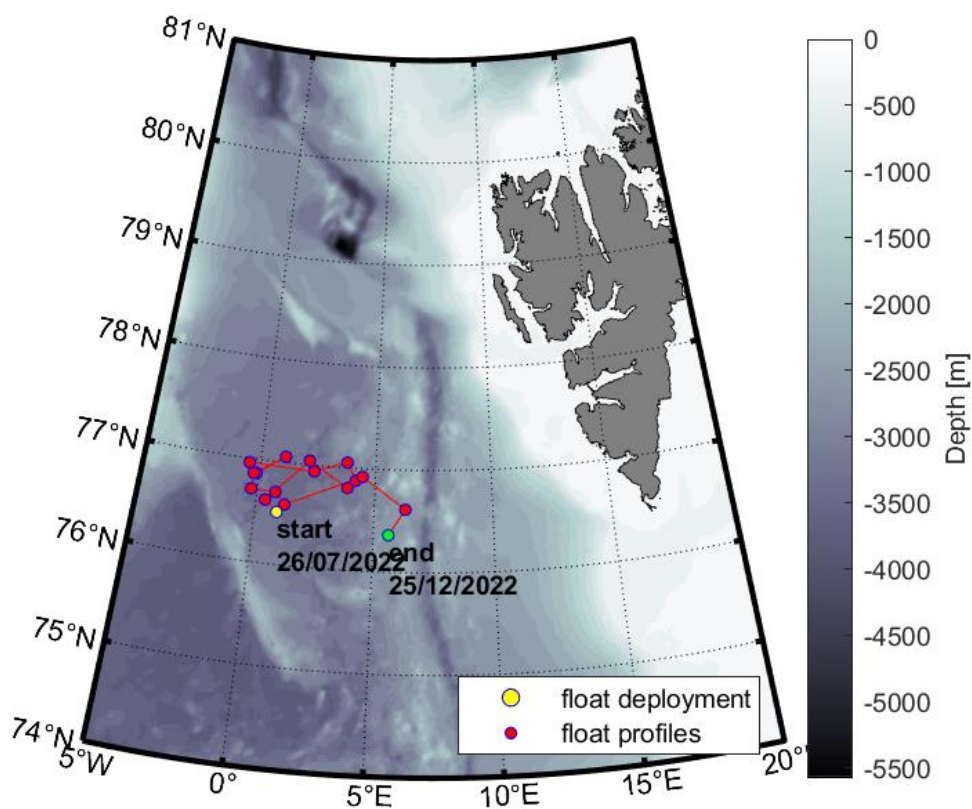


Figure 1. Position of deployment and trajectory of the Argo float (WMO 3902116) deployed in the Greenland Sea by the Argo Poland program in July 2022.

The parking depth was set at 1000 dbars and the profiling depth at 2000 dbars. The float has cycles of 10 days. The float was operated for the whole of 2022 and sent 16 complete sets of hydrographic data by the end of the year. The instrument is the ARVOR-I float with the Iridium transmission system. In addition to standard CTD measurements, the float also takes measurements of dissolved oxygen.

In 2022, IOPAN conducted two experiments using the Argo float in the very shallow water of the southern Baltic Sea. In both cases, we chose the Bay of Puck as the place to deploy the float (Figure 2). The first experiment consisted in anchoring the float at a depth of 15 m. An acoustic release, a buoyancy buoy and a 25 m long line were attached to the 25 kg ballast. The float was attached to the end of the line. The length of the line (about 1.7 times the depth of the water body) allows for free emergence, and the line (with a slightly positive buoyancy) does not reach the surface when the float stays at the bottom. The float was launched on May 26 at 1 p.m. in the sheltered waters of the Bay of Puck. The float was initially configured with a cycle time of 2 hours and a park pressure of 100 dbar. After 4 days the frequency of profiling was changed to 7 hours. The first test lasted until June 18, 2022. An acoustic release was used to disconnect the float from the dead anchor. The whole set - acoustic release, float and buoyancy buoy were recovered. The experiment was carried out with the wind up to 6 B, with a wave height of up to 1 m.

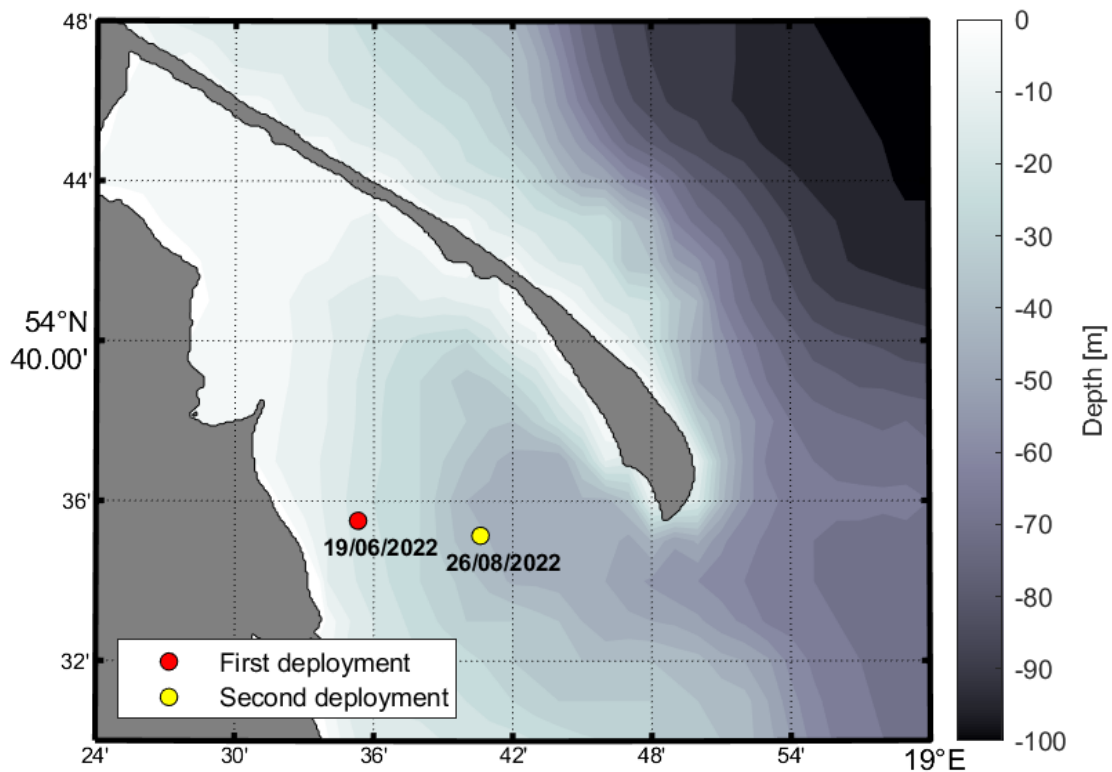


Figure 2. Deployment positions of the test Argo float launched in the southern Baltic Sea.

In August 2022 the experiment was repeated. The float was anchored at a depth of 40 m in a sheltered area of the Bay of Puck. A 60 m long line, an acoustic release and a dead anchor were used. The float was configured for sampling at a frequency of 7 hours. The second test lasted until December 5, 2022.

b. technical problems encountered and solved

The Arctic float was deployed by the Institute of Oceanology Polish Academy of Sciences (IO PAN) from the board of the Institute research vessel 'Oceania'. There were no technical problems with the float.

c. status of contributions to Argo data management.

Data from the Arctic float were provided to the Ifremer Argo Center and processed in the Center. All data are available online. IO PAN provided CTD data collected by *r/v Oceania* during AREX cruises in the Nordic Seas (2000-2018) and the Baltic Sea (2016-2021) to the Argo references database.

d. status of delayed mode quality control process

Standard DMQC procedures have been used by DMQC operator from IOPAN for the following Arctic floats:

3902102 – Salinity correction was needed.

3902103 – Salinity correction was needed.

3902105 - It is fine and needs no correction.

3902107 – It is fine and needs no correction.

3902108 – It is fine and needs no correction.

3902111 – It is fine and needs no correction.

3902112 – Salinity correction was needed.

D-files were submitted on GDAC.

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

In 2021, the Institute of Oceanology of the Polish Academy of Sciences applied to the Ministry of Science and Education for funding the Argo-Poland consortium. The members of the consortium are the Institute of Oceanology PAN, the Institute of Geophysics PAN and the Polish Naval Academy. In 2022, we received funding from the Polish Ministry for the next five years.

3. Summary of deployment plans.

Argo-Poland plans to launch one float a year in the Baltic Sea and at least two in the European Arctic.

4. Summary of national research and operational uses of Argo data as well as contributions to Argo Regional Centers.

IO PAN runs the long-term Nordic Seas observation program AREX. Argo floats are a valuable source of data complementing the measurement data obtained by *r/v Oceania*. This applies in particular to the variability of the seasonal properties of water masses (cruises are conducted only in summer) and sea currents pathways in the Svalbard region.

<https://old.iopan.pl/hydrodynamics/po/Argo/argo.html>

At the Baltic Sea Argo floats data are used to monitor the inflow of salty waters from the North Sea. Also, data on the oxygen content in the depths of the Baltic Sea and current pathways are especially valuable. Argo data are also used for the modelling in the SatBaltyk project.

<http://www.satbaltyk.pl/en/>

Also, project SufMix (Turbulent Mixing in the Slupsk Furrow) uses Argo data.

5. Issues that your country wishes to be considered and resolved by the Argo Steering Team regarding the international operation of Argo.

No issues.

6. CTD stations

In 2022 one Polish float was deployed during IOPAN Arctic cruise AREX, when 249 CTD profiles have been done. The CTD station was also performed just before the float deployment. IOPAN can provide the data from this station to compare it with the Argo float.

The rest of the data from the Nordic Seas are available via IOPAN database. Contact point: Waldemar Walczowski, walczows@iopan.pl.

7. Argo bibliography

There are two research articles using the Argo data in progress.

8. How has COVID-19 impacted your National Program's

No problems with floats deployment and recovery.