



Argo-Poland National Report 2025

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1. Your country: Poland
2. Overall implementation status OneArgo array

Argo-Poland is implemented by the Institute of Oceanology of the Polish Academy of Sciences (IOPAN) and constitutes Poland's contribution to the global OneArgo array. Since 2009, the Institute has deployed a total of 50 Argo profiling floats, 28 of which were launched in the Nordic Seas from the research vessel *r/v Oceania* and three in the same region from *r/v Horizont II*. Since November 2016, IOPAN has also deployed 19 floats in the Baltic Sea, all from *r/v Oceania*.

- a. Number of floats deployed in each mission in 2025 (can be accessed via [OceanOPS](#))

In 2025, Poland deployed five Argo floats from the research vessel *r/v Oceania* within the OneArgo framework: two floats in the Polar Mission (Nordic Seas) and three floats in the Marginal Seas Mission (Baltic Sea).

Two Argo floats (WMO 5907173 and 3902664) were deployed in the Nordic Seas in early July 2025 at 75.02°N, 15.45°E and 75.05°N, 8.45°E, respectively (Figure 1). Both instruments are ARVOR floats manufactured by NKE, equipped with Iridium telemetry and ice-avoidance algorithms. The parking depth was set to 1000 dbars and the profiling depth to 2000 dbars, with a nominal cycle length of 10 days. In addition to standard CTD measurements, both floats also measured dissolved oxygen. The float deployed in the eastern branch of the West Spitsbergen Current (WMO 5907173) followed the expected northward pathway towards Fram Strait. As it approached the sea-ice edge, its cycle interval was shortened to 5 days to maximise data return before a likely submergence beneath the ice. This float stopped transmitting on 13 December 2025, most likely after drifting under sea ice; by that time it had completed 21 cycles. The second float (WMO 3902664) remained in regular operation throughout 2025, delivering 18 complete CTD and dissolved oxygen profiles by year-end, and it continues to be active at the time of writing.

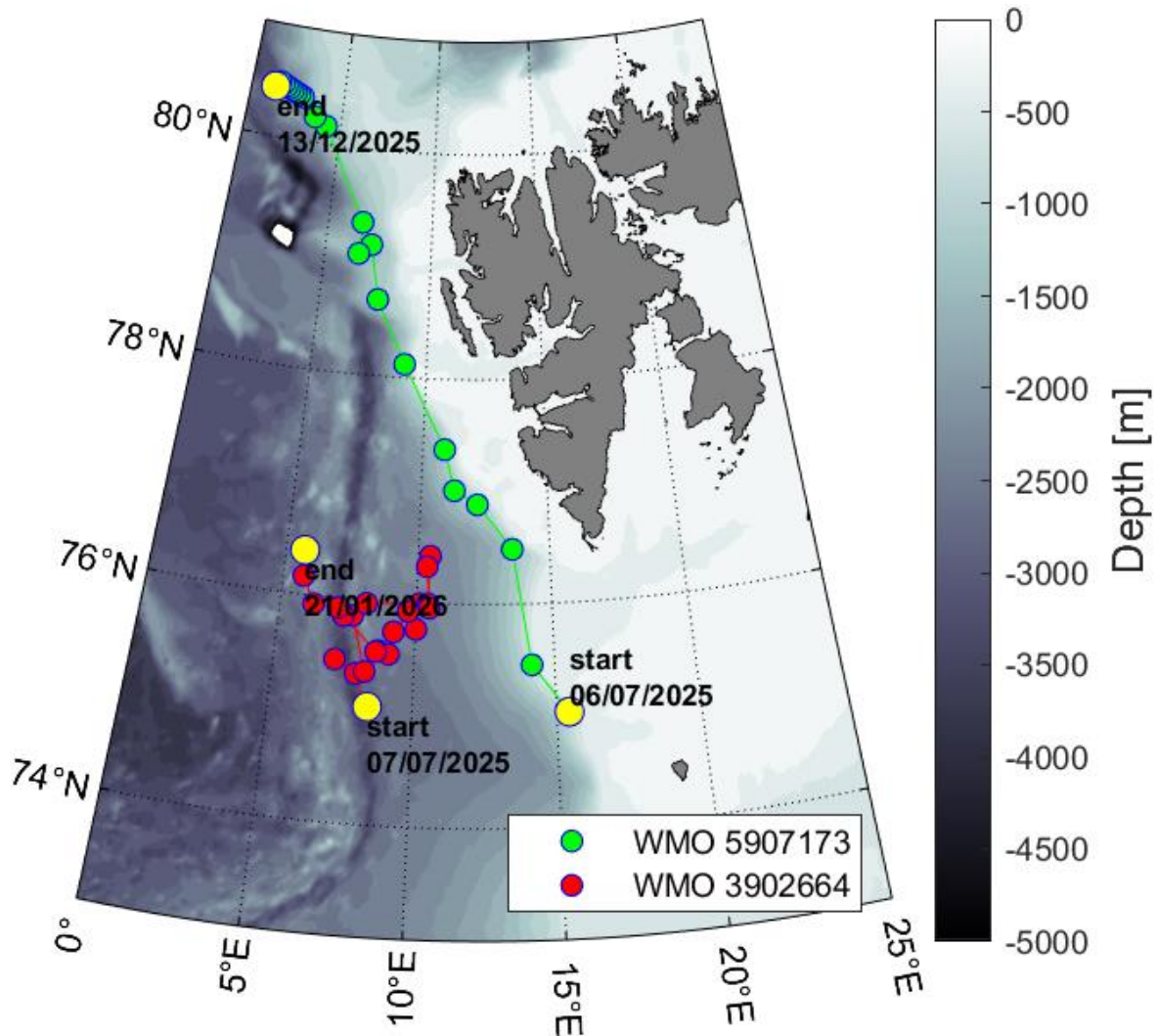


Figure 1. Positions of deployment and trajectories of two Argo floats deployed in the Nordic Seas by Argo-Poland program in July 2025.

In the Baltic Sea, three Argo floats were deployed from *r/v Oceania* during hydrodynamic cruises in 2025 (Figure 2). All three are ARVOR-type floats equipped with Iridium data transmission and sensors for temperature, salinity, pressure and dissolved oxygen. They operate with cycle intervals of 1–2 days. Float WMO 6990707 was deployed in June 2025 in the Bornholm Basin (55.22°N, 16.16°E). It was configured to park on the seabed, effectively acting as a virtual mooring, and completed 93 cycles by the end of 2025. Float WMO 2904032 was launched in October 2025 in the Gdańsk Deep (54.85°N, 19.23°E), also with bottom parking; it performed 41 cycles by year-end. The third float, WMO 6990708, was deployed in December 2025 in the Bornholm Basin (55.23°N, 16.10°E). This float was programmed to park in mid-water to facilitate its advection into the Słupsk Furrow, where a subsequent adjustment of the parking depth to the seabed is planned. By the end of 2025, it had completed 23 cycles. All three Baltic floats remained active at the close of the reporting period.

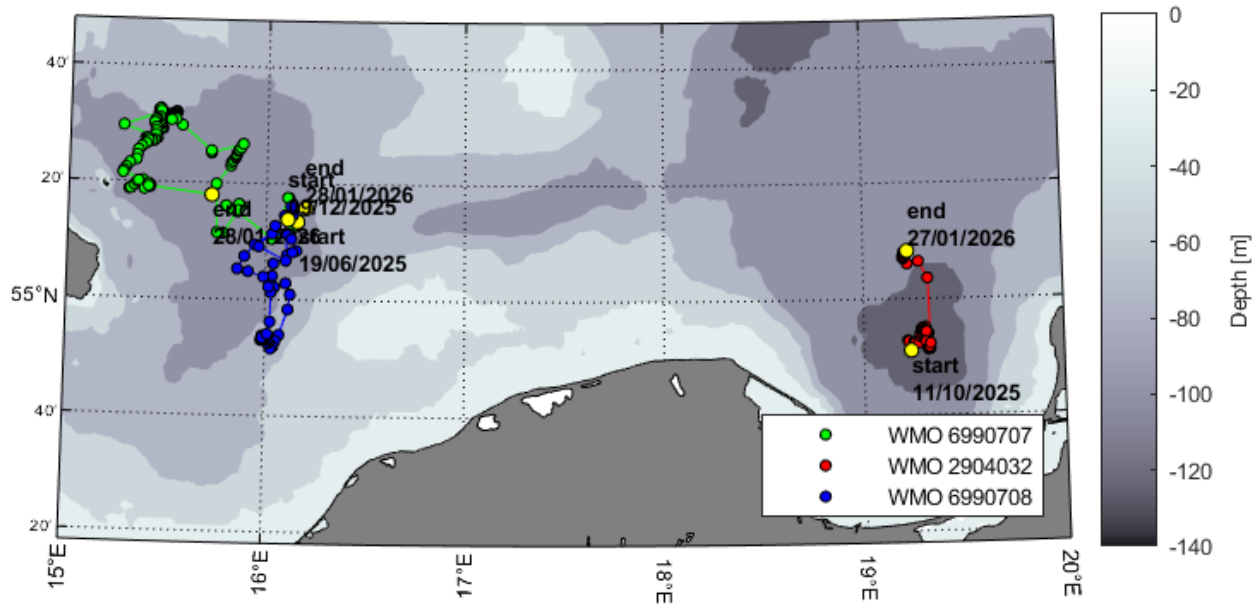


Figure 2. Positions of deployment and trajectories of three Argo floats deployed in the Baltic Sea by Argo-Poland program in 2025.

b. Technical and operational problems encountered and solutions, if identified

The Arctic and Baltic floats were successfully deployed by the Institute of Oceanology of the Polish Academy of Sciences (IO PAN) from the *r/v Oceania*. All instruments operated as expected both during deployment operations and throughout the entire reporting period

In 2025, a major operational challenge was the recovery of a biogeochemical Argo (BGC) float operating for two years in the Gdańsk Deep. Its recovery was complicated by progressively depleting batteries, adverse weather conditions and the fact that the float had drifted a considerable distance from its deployment site. The operation required careful timing and coordination. Favourable circulation patterns, monitored by the modelling team, brought the float back into a suitable recovery area, and close collaboration between the scientific team and the navigation crew of *r/v Oceania* ultimately enabled its successful retrieval on 7 October 2025. The experience gained from this operation will support the design and implementation of a long-term Argo-based monitoring system for the southern Baltic Sea.

c. Achievements

In 2025, Poland strengthened its contribution to the Polar and Marginal Seas Missions by increasing the number of active floats in both the Nordic Seas and the Baltic Sea, providing high-frequency profiles (1–2-day cycles) in key basins such as the Bornholm Basin and the Gdańsk Deep. These observations significantly improved the temporal and spatial coverage of hydrographic and oxygen measurements in marginal seas and high-latitude regions.

- d. Summary of Argo Data Management achievements and challenges for each mission.
 - i. Please include the status of your real time and delayed mode data stream for each Mission. If possible, please provide the percentage of mission data processed in real time and in delayed mode according to agreed upon ADMT procedures.

For both the Polar Mission (Arctic/Nordic Seas) and the Marginal Seas Mission (Baltic Sea), data from Polish Argo floats are routinely transmitted in real time via Iridium and submitted to the Ifremer Argo Centre, where they are processed and made available online through the global Argo data system.

IOPAN has been performing delayed-mode quality control (DMQC) on data from Arctic floats deployed since 2018 within the Polar Mission. Since 2025, this activity has been extended to include delayed-mode quality control of dissolved oxygen measurements from Arctic floats. For core Arctic floats deployed prior to 2018, DMQC continues to be carried out by BSH (Federal Maritime and Hydrographic Agency) in Hamburg, Germany. In the Baltic Sea, Argo-Poland actively contributes to the development and refinement of DMQC procedures tailored to the specific conditions of the Marginal Seas Mission.

- ii. Please describe challenges your nation faces in data management.

A key ongoing challenge for Poland's Argo data management is the development, testing and implementation of robust DMQC procedures for floats operating in the Baltic Sea, where shallow depths, strong stratification and highly variable hydrographic conditions differ significantly from open-ocean environments and require mission-specific approaches. In the Polar Mission, the extension of DMQC to include dissolved oxygen data from Arctic floats further increases the methodological and workload demands on the national data management team.

3. Float deployments for 2026

This year, we are asking for a [separate spreadsheet](#) to be filled out with your nation's deployment plans for 2026 (not including already deployed floats). This spreadsheet is very similar to the one OceanOPS requests for deployment notification and will be used to enter deployment plans into OceanOPS. All plans are then accessible from OceanOPS and can be downloaded in csv format. We are hoping that changing to this format will reduce the times you are asked to provide this information and will allow plans to be aggregated and uploaded into OceanOPS for a more complete picture of deployments in the coming year.

The link to the spreadsheet is [here](#).

Please note that the first sheet, named reference list, explains how to fill in the second sheet, named Argo Planning. If you do not know the latitude and longitude for deployment,

please enter a code for the ocean basin. Ship name and WMO are desired, but not required. The final column is mandatory and asks for a simple indicator if an experimental sensor or parameter is on the float.

Argo-Poland plans to deploy at least three floats annually, with two in the European Arctic and at least one in the Baltic Sea. In 2026, three floats are planned for deployment: two in the Nordic Seas and one in the Baltic Sea.

4. Float commitments for 2027+

Please fill in the table below with your best estimates of float commitments in the years 2027 and beyond. This is to help us model progress towards OneArgo implementation, but it is understood that predictions in the future are uncertain.

For the columns from 'core' to 'deep + oxygen', please include floats that are planned for the Polar regions. The 'Total' column should be the total number of floats. The 'Polar' column is where you can indicate the number of floats in the columns to the left that will be deployed in the Polar regions.

The final column is to help the AST monitor the usage of experimental sensors and parameters planned for the coming years. Please list sensor maker and parameter.

year	Core	Core + O	Core + 2-3 BGC	Core + 4-6 BGC	Deep	Deep + O	Total	Polar	Exp Sensor or parameter (please state sensor maker & parameter)
2027		3					3	2	
2028		3					3	2	
2029		3					3	2	
2030		3					3	2	

5. Funding level

- a. Present level of funding and prospects for future funding for OneArgo in your country. If possible, please break it down by Mission: core, BGC, Deep, Polar. In addition, please describe the number of persons who make up the Argo team in your nation.

In 2021, the Institute of Oceanology of the Polish Academy of Sciences submitted an application to the Ministry of Science and Education for funding the Argo-Poland consortium. The consortium comprises the Institute of Oceanology PAN, the Institute of Geophysics PAN, and the Polish Naval Academy. In 2022, the Ministry approved funding for the consortium, securing financial support for a five-year period. The funding ensures deployment of two Polar (Arctic) and one Baltic core floats every year, and one Baltic BGC float every two years. The Polish Argo team consists of four part-time employees and associates.

The current funding is guaranteed until the end of 2026. A new funding application is planned to be submitted in 2027 to ensure continued support for Poland's contribution to the OneArgo programme.

6. Research and development efforts on floats or sensors

- a. Please describe any research and development efforts over the past year within your National Program to improve either float or sensor technology. This could include implementation of new sensors or improvements to existing sensors and floats.

In 2025, Argo-Poland conducted innovative operational experiments with an anchored Argo float in Hornsund Fjord (West Spitsbergen). The float was deployed, operated for approximately three months, and successfully recovered. This experiment aimed to assess the feasibility of using Argo technology in shallow, semi-enclosed Arctic environments and to evaluate its potential for high-resolution monitoring in fjord systems. The experience gained contributes to methodological development for extending Argo applications beyond open-ocean conditions.

7. Issues to be addressed at AST-27

- a. The AST meetings are a chance to come together as a community to discuss issues together. These issues could pertain to the various mission paths, float or sensor technology issues, funding issues, questions for manufacturers, the

implementation of Argo, the functions provided by OceanOPS or the Argo Program Office, etc. Please list issues you would like to hear feedback from the AST on and these will be incorporated into the Agenda if the report is submitted in a timely manner. If you prefer, you can reach out directly to argo@ucsd.edu with your issues.

Poland does not propose any specific issues for discussion at AST-27 at this time.

- b. Please send questions that you want manufacturers to address at AST-27. There will be float and sensor manufacturers there and we want to send them specific questions to be answered at the meeting. Please indicate which manufacturer(s) you would like your questions addressed to. If you prefer, you can reach out directly to argo@ucsd.edu with your questions.

No specific questions for manufacturers are proposed at this time.

8. National uses of Argo data, access tools + more

- a. Please describe any new products, new access tools or data manipulation tools, or uses of Argo data in your country that are not included on the following pages:
Deprecated product
 - i. <https://argo.ucsd.edu/data/argo-data-products/>
 - ii. <https://biogeochemical-argo.org/bgc-data-products.php>
 - iii. <https://argo.ucsd.edu/data/data-visualizations/>
 - iv. <https://argo.ucsd.edu/data/argo-software-tools/>

Please include links, if applicable, to products or services.

No new national products or access tools beyond those already described in previous reports are reported at this time. Argo data continue to be used in long-term Nordic Seas observations (AREX), Baltic Sea monitoring and modelling activities (e.g. SatBałtyk, 4DBALTDYN, EA One).

In addition, Argo data contributed to the national marine environmental monitoring report in cooperation with the Institute of Meteorology and Water Management (IMGW), based on continuous physicochemical measurements in Polish waters of the Baltic Sea. This is a document prepared at the request of the Polish Chief Inspectorate for Environmental Protection and is a contribution to the EU Marine Strategy Framework Directive (MSFD).

9. Outreach and Communications

- a. Visibility for Argo is important, so please let us know of any national efforts to raise Argo's visibility including:
 - i. Social media accounts

The Institute of Oceanology of the Polish Academy of Sciences maintains active social media accounts, including an official Facebook page, Instagram profile and LinkedIn presence, where key information and updates on Argo-Poland activities and related events are regularly shared.

- ii. Outreach efforts over the past year

- **Baltic Sea Science Congress 2025:** Promoted the Argo program through an information booth, scientific posters, and an oral presentation, highlighting Argo float technology and Poland's contribution to Baltic Sea and global ocean observing.
- **Sopot Science Picnic 2025:** Engaged the public with hands-on outreach at the "Argo – robots tracking the changing oceans" booth, featuring a real Argo float, interactive activities, and data visualizations from Polish Argo missions.
- **School visits / "Adopt a Float":** Delivered educational workshops and international "Adopt a Float" activities with partner schools in Poland and Finland, enabling students to sign, name, and track an Argo float mission while learning about Baltic Sea processes and ocean monitoring.

- iii. Articles or news items of note in the past year

Rak, D., Expert: Argo scientific profiling floats may be misidentified as torpedoes, published on naukawpolsce.pl, 23 April 2025. The article is available online (in Polish).

- iv. Representation of Argo at meetings, or organization of national-level meetings around Argo?

In 2025, Argo-Poland was actively represented at national and international scientific meetings through oral and poster presentations, including:

- **ICARP IV – International Conference on Arctic Research Planning** (Boulder, USA, 25–28 March 2025) – poster presentation,
- **IO PAN Annual Seminar** (Sopot, Poland, 31 March 2025) – oral presentation,
- **15th Baltic Sea Science Congress** (Sopot, Poland, 26–30 May 2025) – oral and poster presentations,
- **BOOS Annual Meeting** (Sopot, Poland, 2–4 June 2025) – oral presentation,

- **8th Euro-Argo Science Meeting** (Crete, Greece, 23–25 September 2025) – oral and poster presentations,
- **40th Polar Symposium** (Puławy, Poland, 4–7 November 2025) – poster presentation,
- **Annual Meeting of the Argo-Poland Consortium** (Sopot, Poland, 14 November 2025) – multiple oral presentations,

The Annual Meeting of the Argo-Poland Consortium and the IO PAN Annual Seminar were organised at the national level.

v. Other efforts

Lecture: Merchel M., Argo Floats: Modern Measurement Devices in Oceanography, Course: Innovations in Oceanography – A Look into the Future, University of Gdańsk, for second-year Master's students in Oceanography, 8.04.2025, Gdańsk, Poland.

The Argo-Poland website is regularly updated and maintained in both Polish and English, providing information on national activities, float deployments, scientific results and outreach initiatives.

- b. Please describe any other tasks or projects that you would like to see the Argo Program Office working on such as specific communication materials, translation services, representation of Argo to national bodies for advocacy, cost-benefit analysis, etc.

10. Bibliography

- a. Please check the Argo [bibliography](#) to see if any papers published by scientists from your country are missing. If they are missing, please include the DOI for the publication here.

Merchel, M., Walczowski, W., Wieczorek, P., 2025, Anchored Argo profiling float experiments in the southern Baltic Sea: Puck Bay and Hel Peninsula. *Frontiers in Marine Science*, 12, <https://doi.org/10.3389/fmars.2025.1569261>.

Walczowski W., Merchel M., 2025. I.5 Characterisation of physicochemical conditions based on continuous measurements. In: *Assessment of the environmental status of Polish marine areas of the Baltic Sea based on 2024 monitoring data in the context of the 2014–2023 decade*, eds. T. Zalewska, W. Kraśniewski, Inspectorate of Environmental Protection, Warsaw, Poland.

- b. Please check the Argo [thesis](#) page to see if any PhD theses in your country are missing. If they are missing, please include the reference here with a URL if possible.

Merchel, M. (2021), Variability of Properties and Spatial Distribution of Deep and Intermediate Waters in the Nordic Seas in the Years 1998–2017, Institute of Oceanology of the Polish Academy of Sciences.

11. Reference database data

- a. Please list CTD data (calibrated with bottle data) or other BGC data taken by your country in the past year that may be added to the CTD reference database or other BGC reference databases. These cruises could be ones designated for Argo calibration purposes only or could be cruises that are open to the public. To help CCHDO track down this data, please list the dates of the cruise and the PI to contact about the data

In 2025, two Polish floats were deployed during the IOPAN Arctic cruise AREX, during which approximately 200 CTD profiles were conducted. Additionally, three floats were launched in the Baltic Sea during a Baltic cruises. CTD stations were also carried out immediately prior to the deployment of the floats. IOPAN can provide data from these four stations for comparison with data from the Argo floats.

The remaining data from the Nordic Seas and the Baltic Sea will be accessible via the IOPAN database. Contact point: Waldemar Walczowski, walczows@iopan.pl.

12. Vacancies/AST, ADMT member changes

- a. Please list any vacancies you anticipate for the next year including postdoc positions, internships, etc. The Argo Program Office will collate this information and help advertise it for you.

No vacancies (including postdoctoral or internship positions) are anticipated for the coming year.

- b. Please review the [AST member](#) and [ADMT members](#) for your nation & submit any changes here or email argo@ucsd.edu.

No changes to the AST or ADMT members representing Poland are reported at this time.

13. Other

- a. Please use this section to add any information you would like to share with the AST which has not already been requested above. If you prefer, you can always reach out directly to argo@ucsd.edu.

No additional information is provided at this time.