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ARGO'S FUTURE: A QUEST FOR SUSTAINABILITY

Although the international Argo programme has become an indispensable instrument for ocean and climate monitoring, forecasting and study, it often lacks clear political commitment, notably on the European level, as well as an appropriate funding system allowing to sustain operations in the long term.



Deployment of a Core Argo float in the Arctic.

A BGC Argo float ready to be deployed.

The international Argo programme has gone a long way since 1998, when a scientific team presented the idea of an international array of floats to take the pulse of our seas and our climate. “Argo has become the dominant data stream for many state estimates of the ocean and it plays a prominent role in forecasting systems,” notes Susan Wijffels, a senior scientist at the Woods Hole Oceanographic Institution (WHOI), USA, and one of the co-founders of the international Argo programme. Today, the programme has an ambitious new design called OneArgo, a United Nations Decade of Ocean Science for Sustainable Development endorsed set of actions to create a global and multidisciplinary Ocean Observing array.

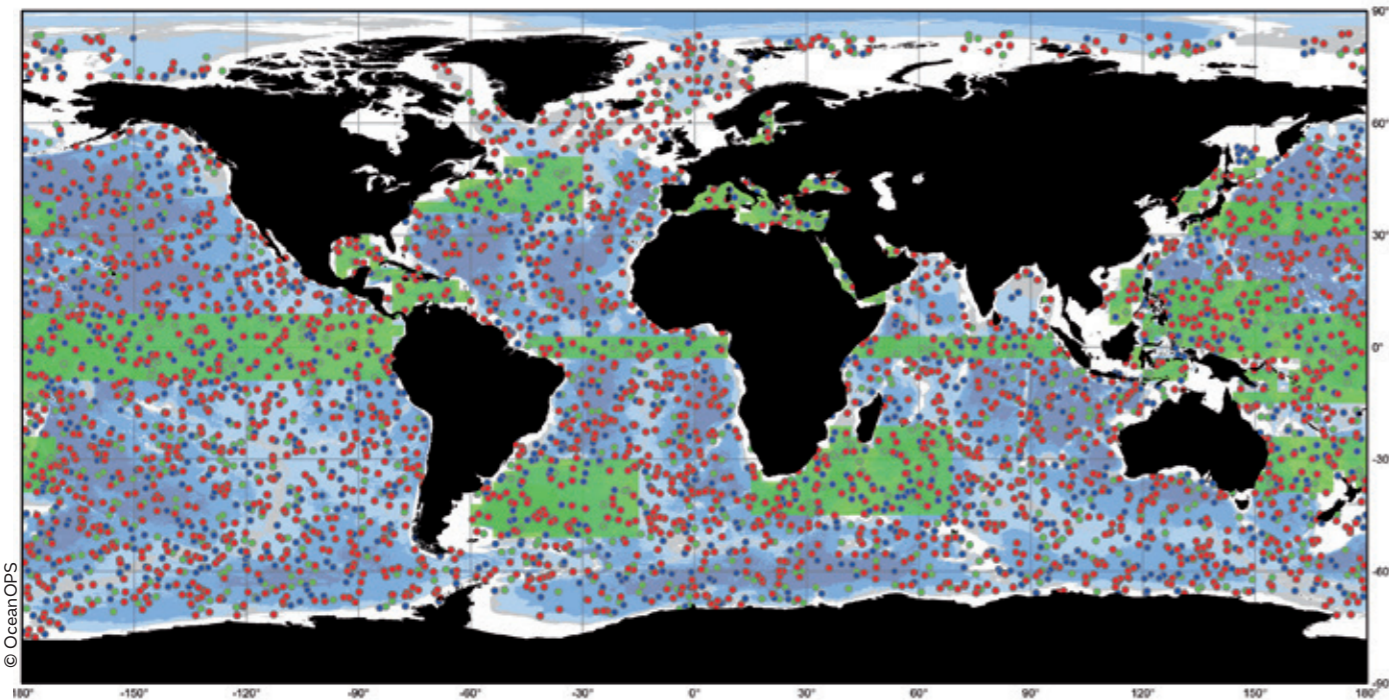
OneArgo aims at reaching 4 700 floats by 2030 – 2 500 Core Argo floats (measuring temperature and salinity), 1 000 Biogeochemical (BGC) floats (able to report up to six additional biogeochemical variables, such as pH) and 1 200 Deep floats (able to dive till the abyss) – and expanding Argo presence into the polar and marginal seas. But despite its success, the Argo

project faces its share of challenges.

Some of them are immediate. “With the Covid-19 pandemic, we have had big supply chain issues,” says Susan Wijffels, who is also an expert of EuroArgo ERIC Scientific and Technical Advisory Group (STAG). “Argo equipment suppliers have been caught with chip shortage and shipping impediments, the latter also bringing mayhem to research vessels that deploy floats. Consequently, some float deployments have been delayed and the Argo community is still in the process of catching up.”

WHAT IS ARGO?

Argo is an international programme that collects information from inside the ocean using a fleet of robotic instruments that drift with the ocean currents and move up and down between the surface and down to 6 000 metres deep. Each instrument, called float, spends almost all its lifetime below the surface.



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OneArgo and its targeted network of 4 700 floats by 2030.

- Core Floats, 2500
 - Deep Floats, 1200
 - BGC Floats, 1000
- OneArgo aims to double the observations coverage in these areas.

Another issue: there are only a few sensor manufacturers able to satisfy Argo floats requirements. This monopoly could hinder the deployment of the BGC Argo floats that require even more sensors. “We need to initiate a dialogue with private-sector sensor developers and encourage multiple sources of sensors to reduce cost and time of development,” says Susan Wijffels.

On another matter, expanding the array in the marginal seas sometimes leads to political hurdles, especially around the exclusive economic zone (EEZ) of some countries. For Susan Wijffels, “it’s a long-term diplomatic challenge to convince these nations that allowing Argo to operate within their EEZ is actually to their benefit.”

But the biggest obstacle on Argo’s path is the lack of sustainable funding. OneArgo is indeed characterised by the progressive deployment of Deep and BGC Argo floats, whose individual costs are respectively two and five times higher than Core floats. The current estimate for the OneArgo design therefore at least triples the annual expenditure allocated to it. “We are in a difficult situation where we are trying to build capacity to operate these Deep and BGC new missions while getting flat or declining funding,” explains Susan Wijffels. Since floats have a four-year lifespan, even maintaining the existing Core Argo

array with current funding is problematic, chiefly because of float and sensor price inflation. With such financial stress weighing on the Argo members, it can be difficult for them to coordinate at the international levels and to overcome certain situations, for instance, when some areas lack floats. As a result, there are gaps in the Argo global network, most noticeably in the Indian Ocean.

“Because the programme has been existing for 20 years, policy makers and even some members of the Argo community think that its long-term future is guaranteed,” notes Sylvie Pouliquen, former Programme Manager of Euro-Argo ERIC. “One of the reasons why we built Euro-Argo was to mobilize European governments’ commitment to the international Argo programme and to bring our members’ voices to decision makers.”

“Although Ocean Observation is a fundamental need, this scientific field has always faced precarious fundings in Europe,” says Zoi Konstantinou, Policy Officer at the European Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE). Thus, Argo funding schemes are varying from one country to another. There is, for instance, a major disparity between Europe and the USA, two of the biggest Argo contributors: in Europe, the high proportion of grants and research programmes in funding reduces

the visibility of support. “The challenge is to convince the European Union (EU) Members that this should be a standardized and shared responsibility, and that a secure funding for this continuous need should be set through collective (EU) funds. As they are based on European research projects, today’s EU support cannot be considered as sustainable.”

“A lot of the work on Argo is carried on the back of a handful of champions: individual scientists who work together, endlessly write proposals and get very short term – four or five years – funding,” also regrets Maria Hood, the G7 Future of the Seas and Oceans Initiative (FSOI) Action Coordinator for the EU4OceanObs project. She collaborates with Euro-Argo ERIC to bring up European priorities such as the monitoring of marginal seas on the international scene. “What happens when those dedicated champions retire or decide to change focus? Do we lose the array?” For Maria Hood, the Argo network of floats has become too important for its continuation to depend on a few champions. “It is time to transition Argo to operational funding and it is

What is G7 Future of Seas and Oceans Initiative?

The G7 initiative is an intergovernmental group working on enhancing financial support and implementation for the Global Ocean Observing System (GOOS). It unites marine scientists and representatives from government agencies and ministries across the G7 nations and the European Union to enhance the global Ocean Observing system that provides ocean data required for the health of our seas and oceans, for weather and climate forecasting, and for the development of a sustainable Blue Economy.

essential to build a bridge to the next generation of scientists,” she concludes. “Scientific and operational users make a daily use of our data, and the new parameters in OneArgo are essential for monitoring the health of the marine ecosystems in threat of the global change. Being the only network that provides a 4D (in depth and over time) synoptic view of the oceans in constant motion, there is drastic need to provide a sustainable financial support to the Argo programme”, concludes Yann-Hervé De Roeck, programme manager of Euro-Argo ERIC.

FIND OUT MORE

- “Euro-Argo: Future Needs and Challenges”: <https://www.youtube.com/watch?v=NHFhMaHaUJQ>
- European Global Ocean Observing System (EuroGOOS): eurogoos.eu
- Global Ocean Observing System (GOOS): www.goosoocean.org
- G7 Future of the Seas and Oceans Initiative: www.g7fsoi.org
- OneArgo: Owens et al. (2022) “OneArgo: A New Paradigm for Observing the Global Ocean”, *Marine Technology Society Journal*, <https://doi.org/10.4031/MTSJ.56.3.8>, 2022

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<https://www.eu4oceanobs.eu/oceanobserving-awareness/ocean-observing-awareness-euro-argo/>



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