Euro-Argo ERIC: a leader in the Argo floats revolution

Since 2014, the Euro-Argo European Research Infrastructure Consortium has been cultivating the power of dozens of science institutes across Europe to grow and upgrade the Argo floats array, a game-changing ocean observation infrastructure, transforming ocean research.

When Birgit Klein deployed her first Argo float at sea 18 years ago, it was an intense experience. "You have something worth the price of a car in your hands and you toss it in the ocean!", remembers this oceanographer from the Federal and Maritime and Hydrographic Agency in Hamburg, Germany. At first glance, these 2-meter long steel cylinders with an antenna on top don't seem like much. But looks can be deceiving. The Argo floats cost indeed between 20 000 and 150 000 euros a piece. And more importantly, they have revolutionized the way we monitor our oceans.

The floats are equipped with sensors that measure ocean properties, like salinity, oxygen and temperature. Once they are deployed, they can sink and rise autonomously. Following a 10-days cycle, they descend down to 1 000 meters where they drift with the currents, then they descend at their final depth, set by the scientists who deployed them, before ascending.

On their way up, their sensors analyze the sea water. They will measure what is called a profile, a set of data all along the water column. Once they reach the surface, the devices transmit their position and their measurements via satellite.

4000 Argo floats
are deployed around the world
with the contribution of
30 countries
representing strong global
cooperation and commitment.

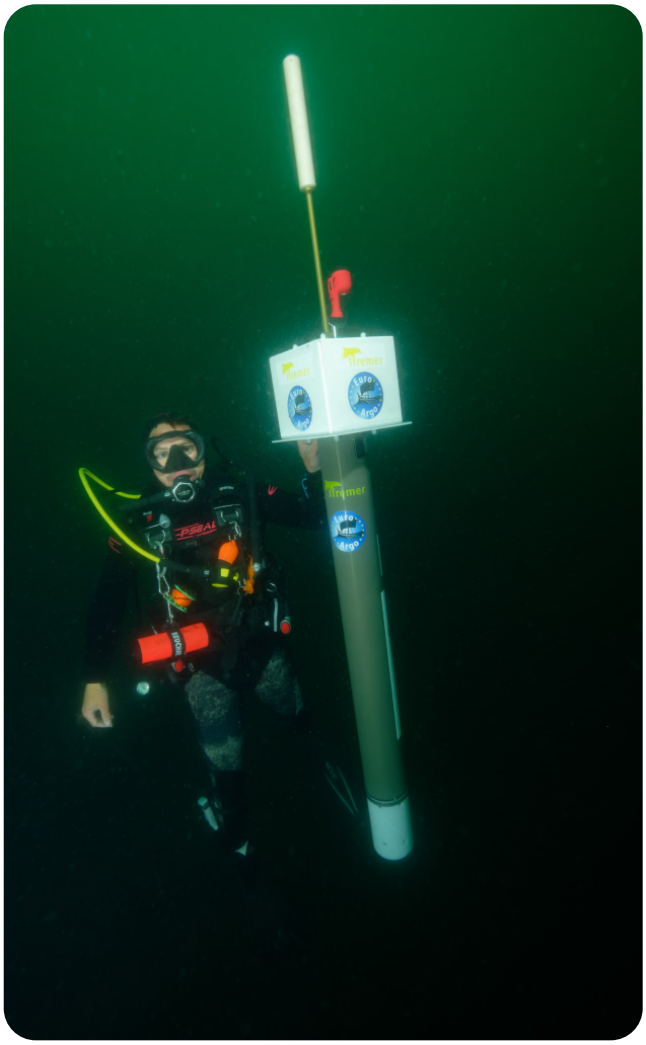
Argo float deployment © Lauren O'Dell/Amundsen Science

The floats are deployed all over our planet in a global network of sentinels constantly surveying our oceans. Their collective data are used for a plethora of applications, from predicting the weather and tracking currents to studying the role of the oceans in our changing climate.

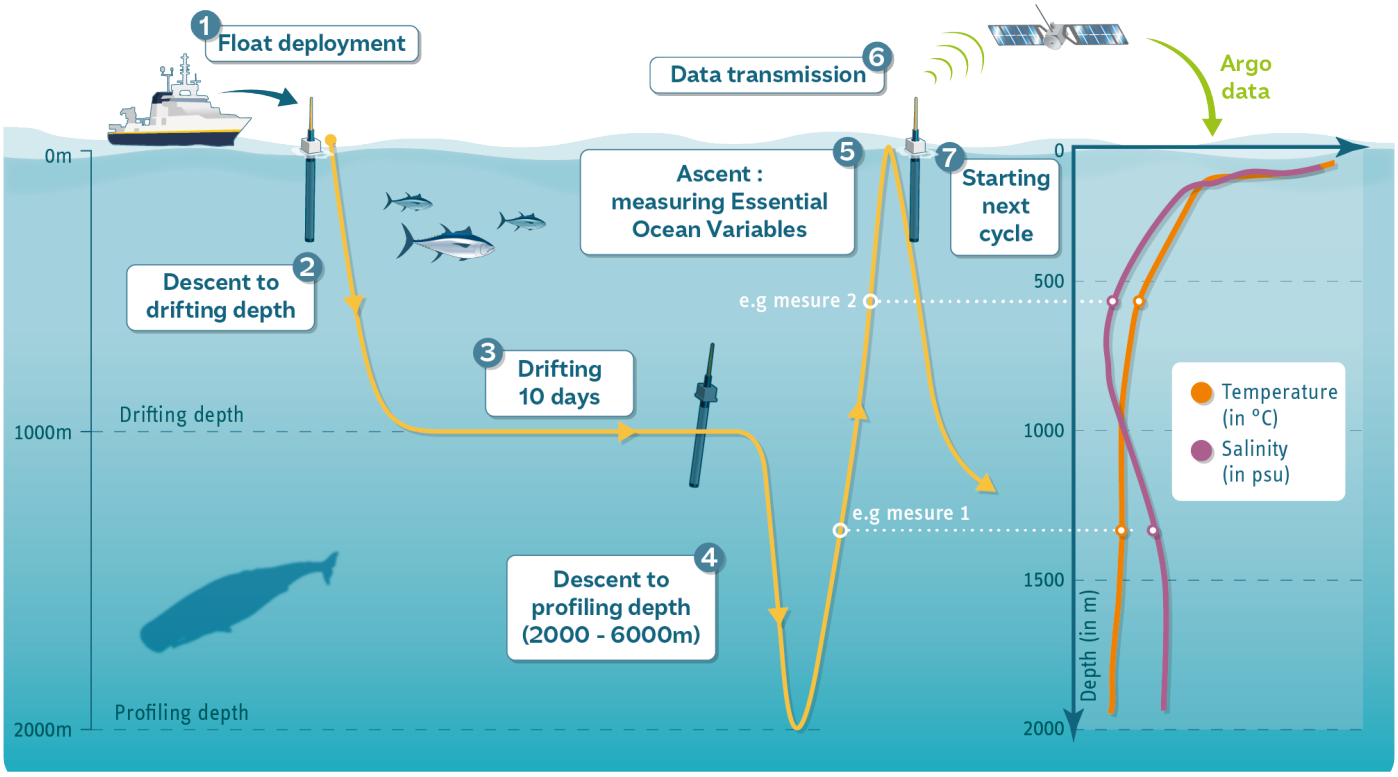
The measurements collected become data that can be used by scientists. And what has also made the Argo program a game-changer since its inception in 1999 is that all the data gathered are free, open, quality-controlled and instantly available to everybody: scientists, businesses and private individuals alike. And with a tally of 4 000 floats deployed all around the planet and made up of 30 different countries' contribution, the program represents strong international scientific cooperation of unique scale.

One quarter of the Argo floats in the world is managed by the Euro-Argo ERIC (European Research Infrastructure Consortium).
"To deploy and maintain the floats, we need continuous funding, that's why we came up with the idea of the ERIC in 2008", recalls Sylvie Pouliquen, co-founder and former director of the Euro-Argo ERIC. In 2014, the infrastructure was finalized and hosted in France, harnessing the political and financial commitment of nine countries. Today, the consortium is composed of 12 European countries and represents a joint effort of 30 science institutes. "We are involved at all levels: floats purchase and deployment, new technology development, data management or research strategy", says Sylvie Pouliquen. "With our partners, we define what this network of floats should be and how it should evolve". Proof that joining forces with the ERIC works: according to Sylvie Pouliquen, one third of the Argo-related research papers recently produced in the world are authored by European teams.

Euro-Argo makes up 25% of the Argo international floats network



Euro-Argo float. © Olivier Dugornay/Ifremer



A full 10-day cycle of an Argo float and the corresponding profile collected. © Thomas Haessig

Besides strengthening the role of Europe within the global Argo program, the Euro-Argo ERIC addresses European specific priorities. One component of its project called Euro-Argo-RISE (Research Infrastructure Sustainability and Enhancement) was to develop techniques and technologies that will help improve the Argo coverage in regional seas where floats are scarce: shallower waters, marginal seas and icy areas such as the European polar seas. The latter is the field of expertise of Birgit Klein, whose agency is part of the Euro-Argo ERIC. “On the European side of the Arctic Ocean, we decided to monitor a large area that is seasonally ice-free”, explains the German researcher. “But you really don’t want the floats to hit some ice at the surface or they could be damaged”. With her colleagues, she’s now studying techniques and tools that could protect the floats against sea ice. And who knows, she might gain some new and intense experience from that.

Sylvie Pouliquen
Euro-Argo ERIC
Former program manager

Birgit Klein
Chair of Euro-Argo ERIC Management Board
Federal Maritime & Hydrographic Agency of Germany (BSH), Argo Germany

The article was produced by Anh-Hoa Truong, an independent scientific journalist/ INUA Prod in close collaboration with Lillian Diarra (Mercator Ocean International) and Marine Bollard (Euro-Argo). It is one of a series of 10 articles showcasing Euro-Argo and its unique contribution to the internatonal Argo program and the global ocean observing system, and how it is transforming ocean research and our understanding of the ocean.

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