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ARGO: AN ESSENTIAL PUBLIC SERVICE

Argo floats benefit our societies in multiple ways: from enhancing weather and climate forecasts to retrieving lost cargo or helping the fishing industry.



Beyond being a revolutionary tool for scientists all around the world, the Argo floats have a tremendous, albeit mostly unrecognised, impact on our societies, and its importance is bound to grow in the near future. “Most of the global population lives near the seashore and will be impacted by sea level rise, coastal flooding and other phenomena caused by climate change,” explains Virginie Thierry, a physical oceanographer at Argo France, a member of Euro-Argo ERIC – the European contribution to the international Argo programme.

The traditional Argo floats measuring temperature and salinity, or Core floats, help better assess climate change. “With its extensions Deep Argo and Biogeochemical Argo, we’ll be able to go further and accurately diagnose climate change,” she adds. “As a result, we will be able to show people how real climate change is.” With Argo’s dataset, scientists can also initiate accurate climate forecast models. “We’ll know exactly how our oceans moderate global warming and we’ll be able to inform policy makers on the decisions they have to make,” says Virginie Thierry.

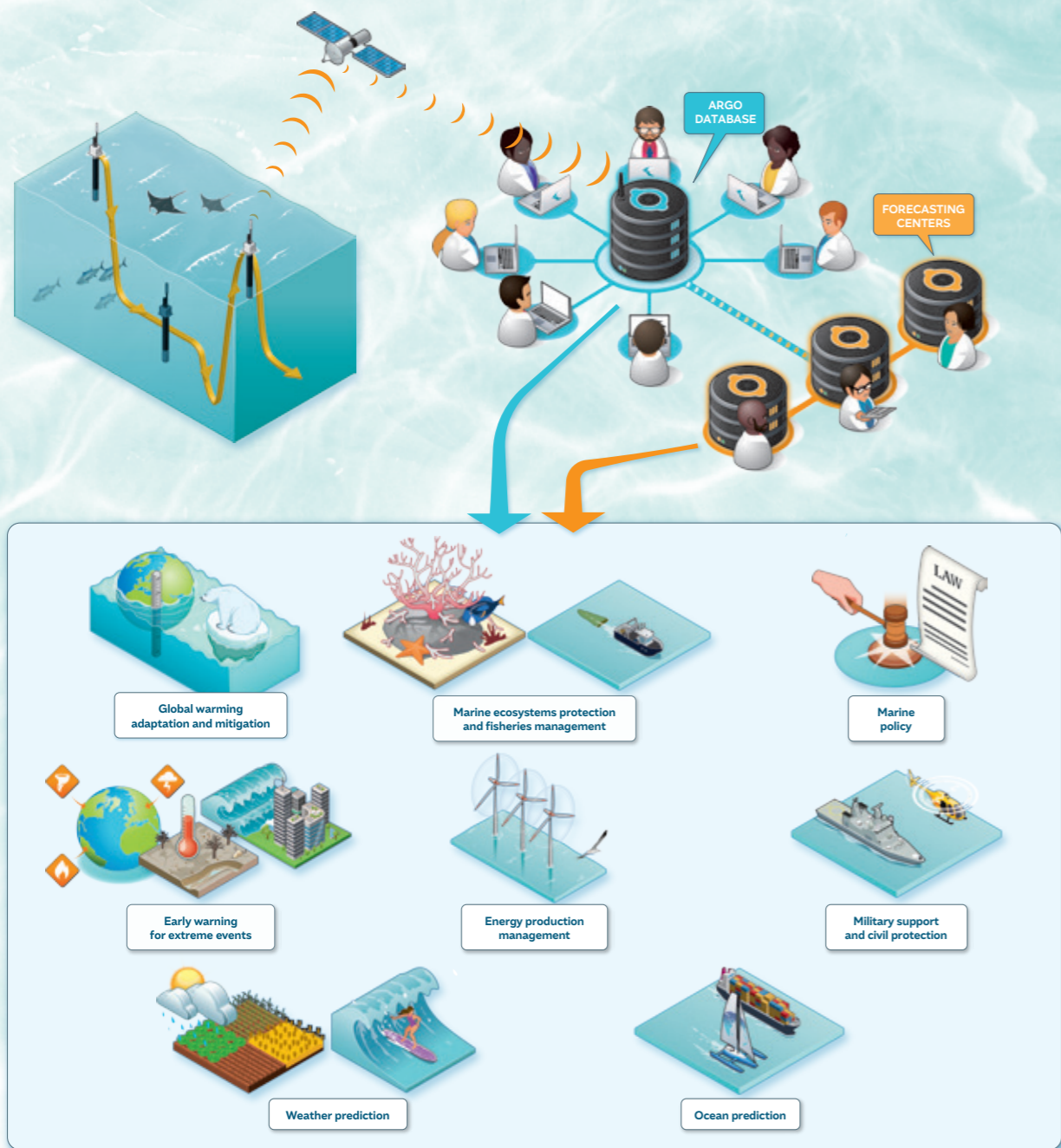
“Argo is now essential for all kinds of forecasts, such as seasonal climate forecasting and weather forecasting,” says Susan Wijffels, a physical oceanographer at the Woods Hole Oceanographic Institution (WHOI), USA, and expert of the Euro-Argo Scientific and Technical Advisory Group (STAG). Historically, weather forecasts were based on satellite data and on pressure or wind measurements from land and ships stations and used only atmospheric models. Today,

these models are starting to include an accurate simulation of the active global ocean thanks to the addition of *in situ* observations, and Argo’s data-set makes the vast bulk of these observations. Argo data is transmitted within a few hours to the World Meteorological Organization (Global Telecommunication System) to be used routinely by Numerical Weather Prediction centers. This data is critical, for example, to improve their ability to forecast the intensity of extreme weather events such as hurricanes, which draw the energy from the ocean heat content. “One of the ways we’re going to manage climate change is by getting people out of the way of these extreme events as their frequency will get higher and higher,” Susan Wijffels says.

For the senior scientist, Ocean Observation programmes like Argo and their data constitute an enormous wealth. “Better observation means better coastal protection and better protection at sea,” she notes. “This is potentially transferable in savings for insurances of human life and properties.”

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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The various fields of applications of Argo data.

WHAT IS AN ERIC?

The European Research Infrastructure Consortium (ERIC) is a specific legal form that facilitates the establishment and operation, on a non-economic basis, of Research Infrastructures with European interest. The ERIC membership is made up, on a voluntary base, of EU Member States and associated countries. By 2022, 24 research infrastructures have been established as ERIC in fields as various as Energy, Environment, Health & Food, Physical Sciences & Engineering, and Social & Cultural Innovation. Euro-Argo ERIC was created in 2014 to coordinate and foster the collaboration between national Argo programmes.

Of course, Argo also plays an essential role in oceanography and particularly operational oceanography, that is, the equivalent for the ocean of weather monitoring and forecasting. Operational oceanography is centered around ocean models that help predict the state of our seas. The data they provide are essential for millions of users around the world, such as fishermen, cargo captains looking for the best route, tourism ships or individuals looking for day-to-day information about their favourite beaches or sailing spots. “*In situ* observations, such as those provided by Argo, highly improve ocean models’ accuracy by grounding them to reality,” explains Audrey Hasson, Head of the GEO Blue Planet European Office at Mercator Ocean International.

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Audrey Hasson
Mercator Ocean International

Argo’s data on ocean currents for instance are particularly useful to study how things drift at sea. “If you’re trying to manage an oil spill, you want to have a detailed forecast of what the currents are going to do in the next two to three weeks,” she says. “Or if you’re looking for a lost container at sea, you want to be able to backtrack or predict where it might go, and Argo floats help reach this high level of detail.” *In situ* Ocean Observations like Argo, satellite observations and ocean models constitute substantial assets



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for the fishing industry as well. For instance, they can help guide fishing vessels to productive zones. This is particularly useful for artisanal fisheries in countries like Bangladesh or Vietnam. “Fishermen consume less fuel as their time at sea can be counted in days instead of weeks,” says Audrey Hasson. “For this profession, less time at sea also means a lesser risk of mortality.”

Argo’s data is getting even more precious thanks to the rise of BGC Argo, a new generation of floats equipped with biogeochemical sensors. These floats help scientists and seafarers better understand our world marine ecosystems, how they are shifting because of climate change, and how dire the impacts are on the resources exploited by the fishing industry.

FIND OUT MORE

- Video “Euro-Argo: Transforming Global Ocean Observation »: <https://youtu.be/im4HVIK4hVU>
- International Argo Programme: argo.ucsd.edu
- Euro-Argo: www.euro-argo.eu
- Biogeochemical (BGC) Argo: biogeochemical-argo.org
- Deep Argo: argo.ucsd.edu/expansion/deep-argo-mission

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



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