

Argo National Data Management Report – Italy (2018) - MedArgo

1. Status

- **Data acquired from floats:** 445 floats were deployed in the Mediterranean and in Black Seas between 2001 and 2018 and more than 55500 CTD profiles were acquired. The temporal and spatial distribution of these profiles is depicted in Figure 1, sorted by the two main float models currently used (Bio-Argo and Core-Argo floats); the monthly and yearly distribution is shown in Figure 2. Note that here Bio-Argo includes the floats with any biogeochemical sensor on board. About 70 floats per months have been operated simultaneously in the basins in 2018 and more than 4000 CTD profiles have been acquired (up to September 2018) by different float models (Figure 3).

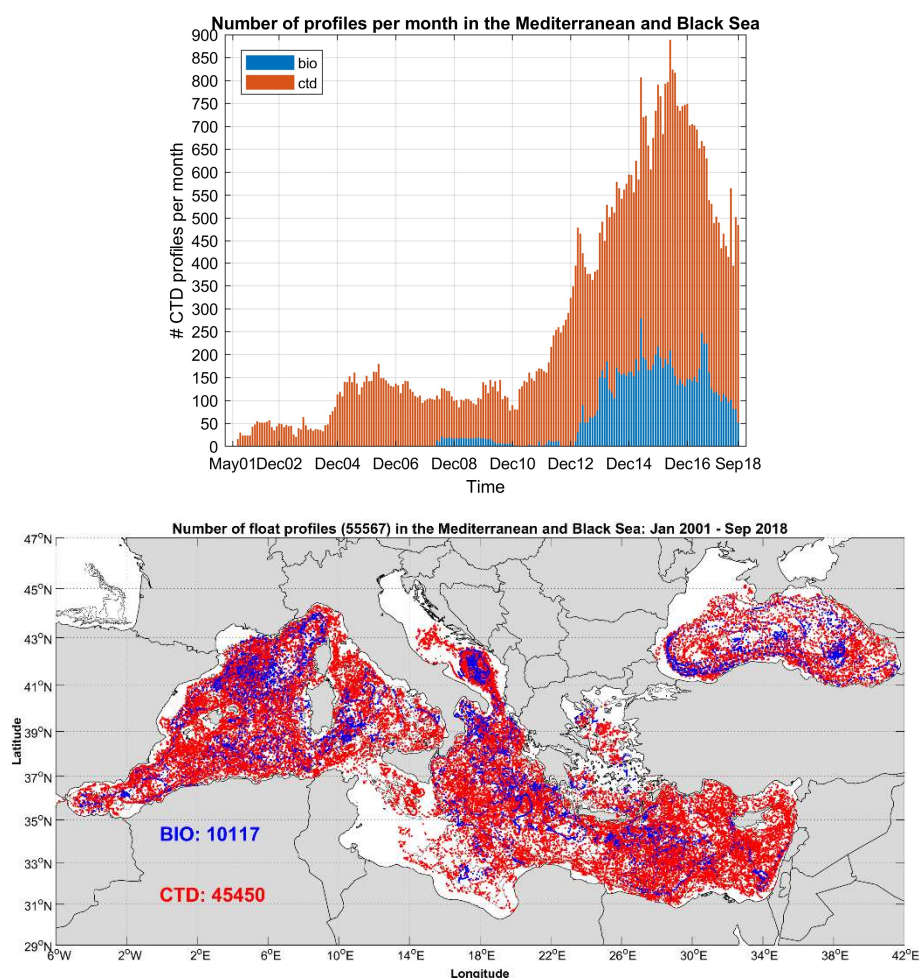


Figure 1. Temporal (upper panel) and spatial (bottom panel) distribution of float profiles in the Mediterranean and Black Sea between 2001 and 2018.

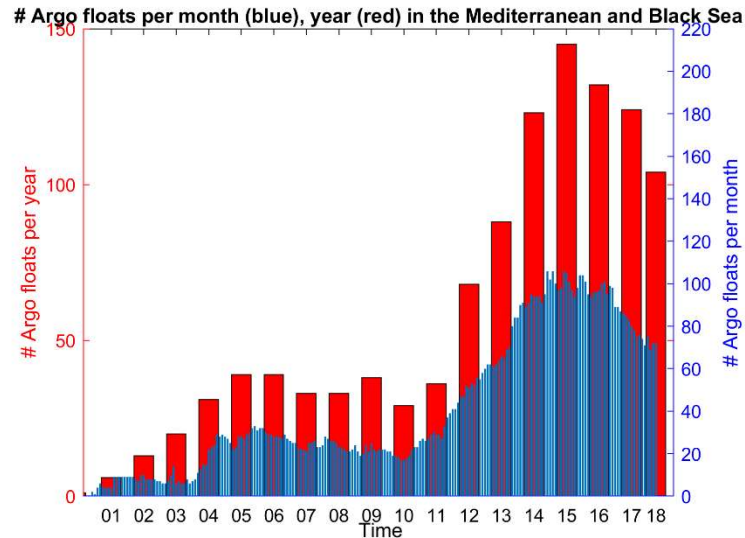


Figure 2. Monthly (blue bars) and yearly (red bars) distribution of Argo floats in the Mediterranean and Black Sea between 2001 and 2018.

The number of CTD profiles acquired by Bio-Argo floats in 2018 (up to September) is about 850 (main contributors: France, Italy and Greece) whilst the ones collected by the core Argo floats are about 3400 (up to September). Euro-Argo and Spain, Greece, France and Italy contributed to maintain/increase the Argo population in 2018: a total of 30 new floats have been deployed both in the Mediterranean and in the Black Seas (Figure 3); 9 out of 30 platforms are equipped with biogeochemical sensors and the deployment strategy was chosen in order to replace dead floats or under-sampled areas.

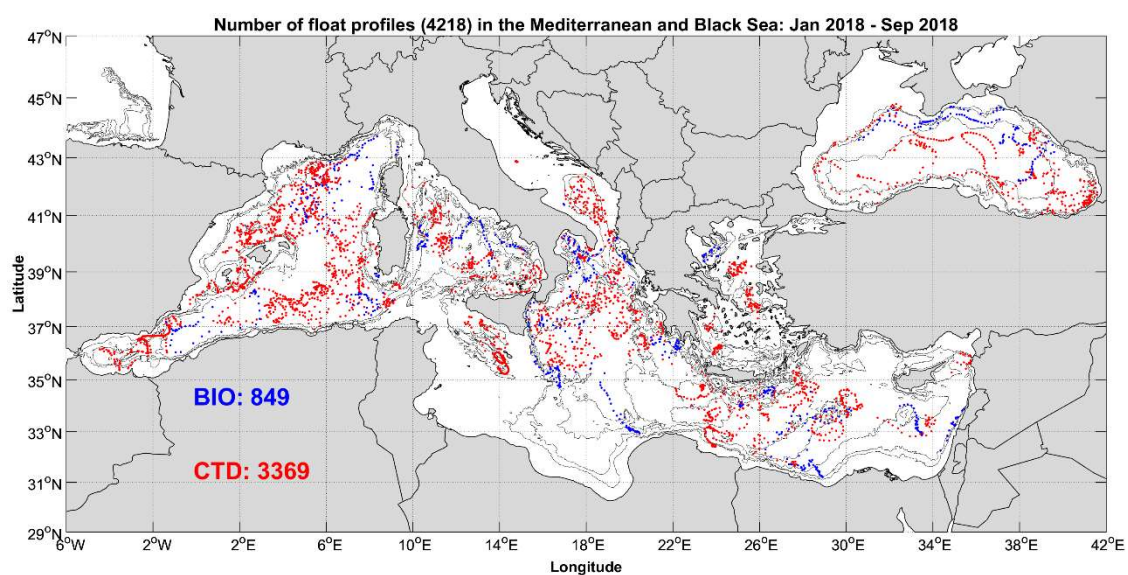


Figure 3. Spatial distribution of profiles collected by Argo floats in 2018 (January-September) in the Mediterranean and Black Sea: Bio-Argo floats (blue dots) and standard Argo floats (red dots).

Statistics of the float survival rate in the Mediterranean Sea were computed, using the entire dataset. The survival rate diagram produced are separated by transmission mode (figure 4). The maximum operating life is more than 430 cycles, whilst the mean half life is about 140 cycles (figure 4a). The vertical distance travelled by floats is computed and used as an indicator of the profiler performance (figure 4b). The maximal distance observed is about 420 km, whilst the mean distance travelled is about 120 km.

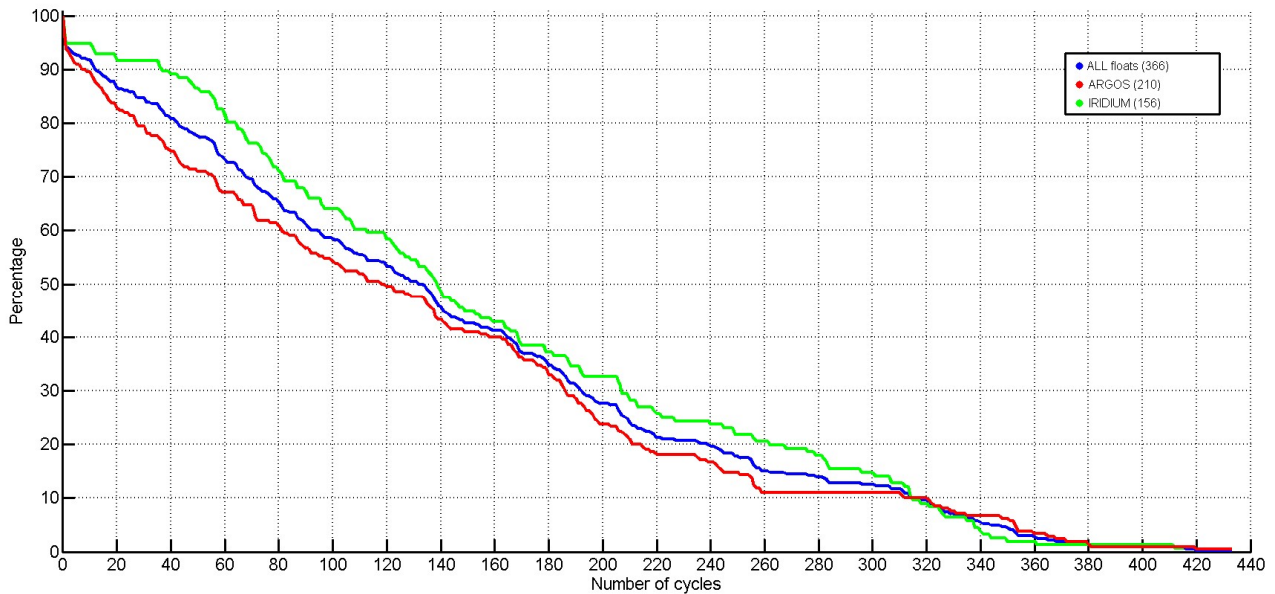


Figure 4a. Survival rate diagrams separated by telemetry system.

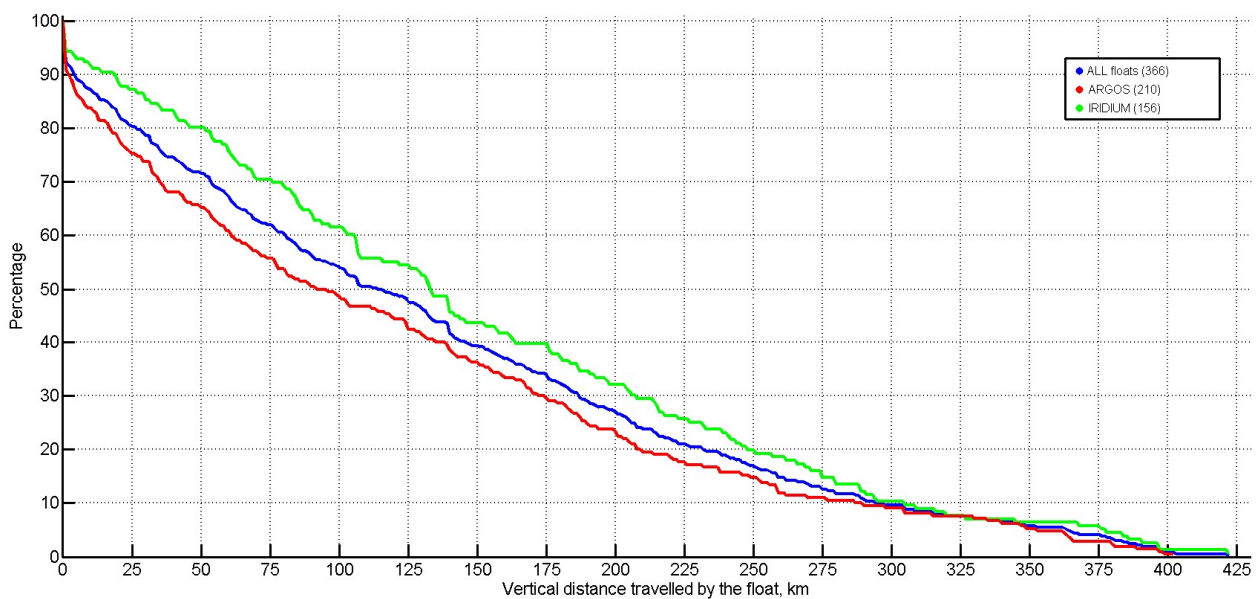


Figure 4b. Diagram of the vertical distance travelled floats, separated by telemetry system.

- **Web pages:**

A completely new web site interface has been designed and developed (<http://maos.inogs.it>). There are sections dedicated to marine platforms, projects and data visualization; Argo floats detailed information can now be achieved by using a searching tool (Figure 5).

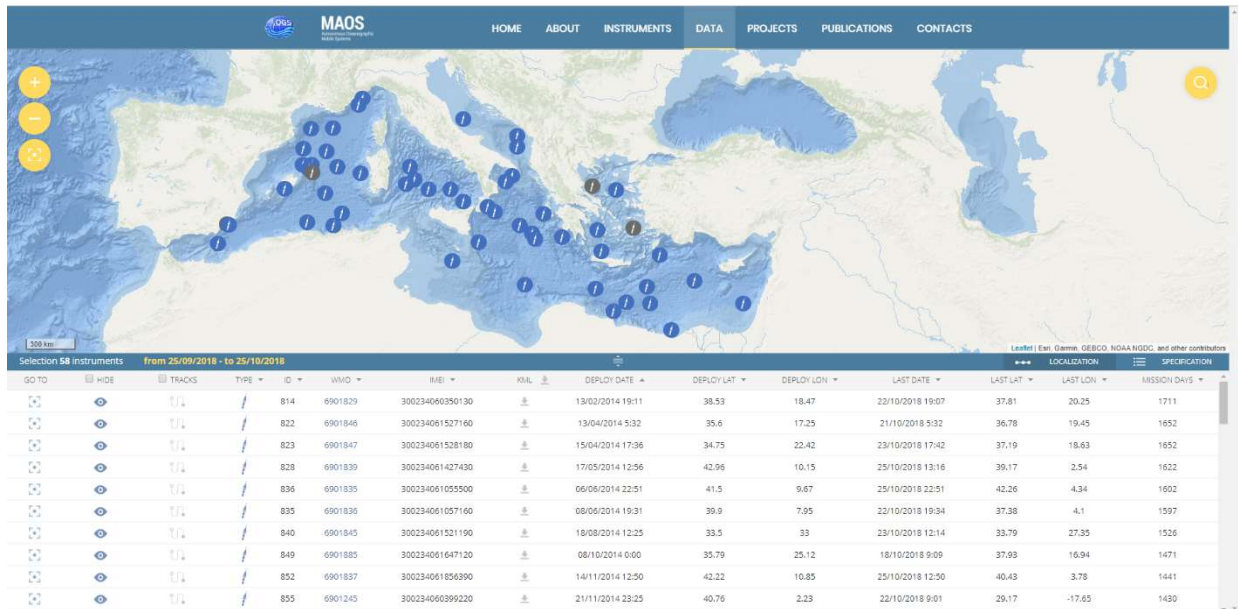


Figure 5. Argo float selection page in the new web site

The old MedArgo web page (<http://nettuno.ogs.trieste.it/sire/medargo/active/index.php>) is still used and tables and graphics are updated in near real time. The floats deployed during 2018 have been added to the web page as soon as the technical information are available. The float positions are plotted daily (Figure 6); the monthly and the whole trajectories are also provided. Links with the GDAC center (Coriolis) are also available for downloading both the real-time and delayed-mode float profiles. A link with the Laboratoire d'Océanographie de Villefranche (OAO - Oceanographic Autonomous Observations) can provide detailed information about Argo floats equipped with biogeochemical sensors.

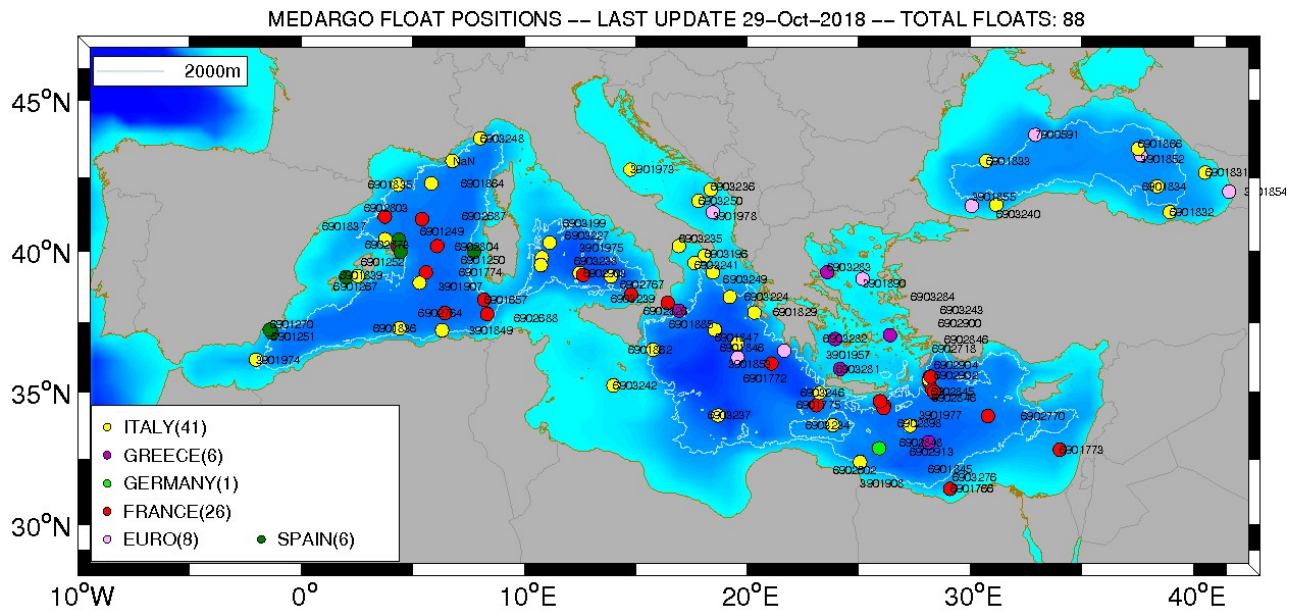


Figure 6. MedArgo float positions as of 29 October 2018 (updated daily).

- **Statistics of Argo data usage:** (operational models, scientific applications, number of National Pis...):
- **Products generated from Argo data:**
 - a. Daily maps of float positions (Figure 6)
 - b. Monthly maps of float positions and track
 - c. Float data are assimilated in numerical forecasting models by INGV (MFS); daily and weekly maps of Mediterranean ocean forecasting system are produced (Figure 7).

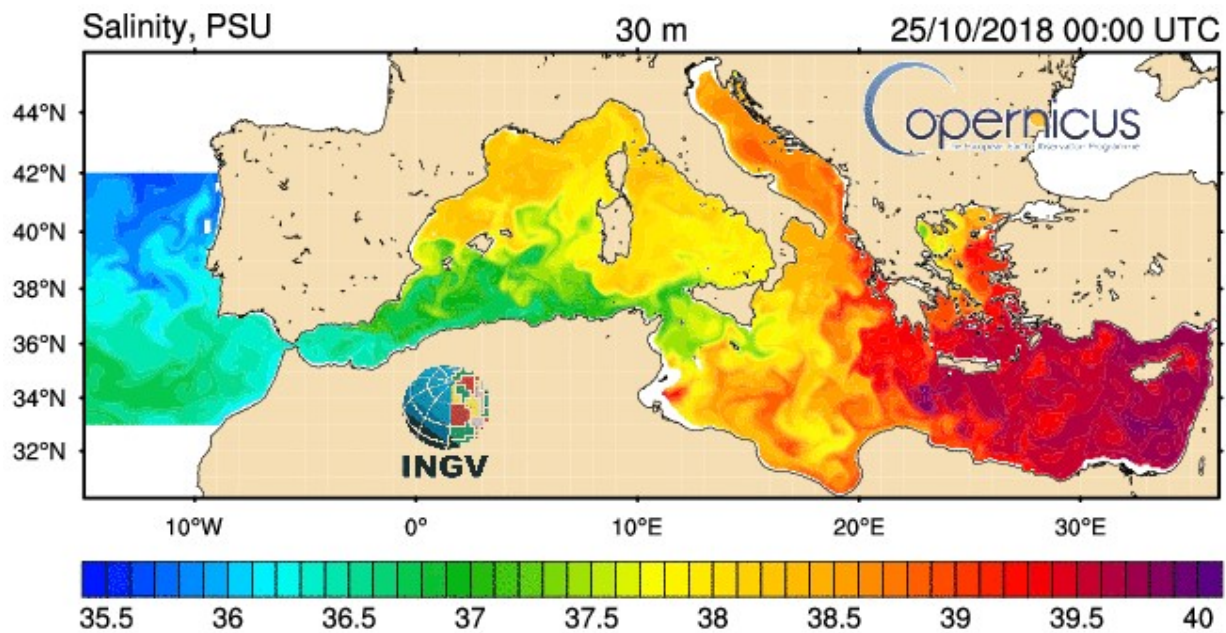


Figure 7. Forecasting model of salinity at 30 meters.

2. Delayed Mode QC

OGS performed the DMQC activity for the Argo data in the Mediterranean and Black Seas. The OW method in conjunction with other procedures is adopted to conduct the quality control analysis for the salinity data.

- Additional and most recent Argo and CTD reference datasets for the Mediterranean and the Black Seas have been added to the current reference dataset. The CTD reference dataset consists of data collected from personal contacts, the CMEMS portal and data provided by Coriolis.
- Since a manufacturing problem linked to the SeaBird Scientific CTD has been highlighted, we perform a preliminary investigation of the floats that could be potentially affected by a salinity drift caused by the CTDs with the serial number in the range of 6000-7100. It seems that 8 floats in the Mediterranean Sea, deployed since 2016, are equipped with this kind of SBE CTD. Three of these floats belong to the France (6901772, 6901774 and 6901775); four floats belong to Italy (6903196, 6903198, 6903199 and 6903202); one float belongs to Greece (6903275). Further analysis will be performed to investigate on any potential salinity drift caused by this manufacturing problem.
- The DMQC method has been applied to about 70% (as of September 2018) of the eligible floats deployed between 2001 and 2017 in the Mediterranean and Black Seas: they were quality controlled in delayed-mode for salinity, temperature and surface pressure and the respective D-files are gradually sent to GDAC. The

DMQC report/info of each float can be downloaded by the MedArgo web page (http://nettuno.ogs.trieste.it/sire/medargo/all/table_out_all.php).

3. Regional Centre Functions

MedArgo is the Argo Regional Centre for the Mediterranean and the Black Sea. OGS, who coordinates the MedArgo activities, established several collaborations with European and non-European countries in order to set the planning and the deployment coordination of floats. Hence, a good coverage is maintained throughout the years. As part of these cooperations the float data are transferred in near real time to MedArgo and 30 new floats have been deployed in the Mediterranean and Black Sea during 2018, through a coordinated activity of deployment opportunities.

The third Arvor Deep was deployed in the Rhodes trench in October 2018. It was set to cycle every 5 days and the parking depth equal to the maximal profiling depth (4000 dbar). The vertical resolution was set at 2 dbar in the upper layer (0-100 dbar), 10 dbar in the intermediate layer (100-700 dbar) and 25 dbar in the deep one. The grounding mode is set to "0" that means the float goes up 50 dbar after grounding and wait there before starting its ascent.

There are 78 active Argo floats in the Mediterranean Sea and 10 in the Black Sea as of 29 October 2018.