

Argo National Data Management Report – Italy (2020) - MedArgo

1. Status

- **Data acquired from floats:** more than 71000 Argo profiles were acquired in the Mediterranean and in Black Seas between 2001 and September 2020. The temporal and spatial distribution of these profiles is depicted in Figure 1, sorted by the different float types used (Core-Argo, Core-Argo with DO, Bio-Argo, Deep-Argo and BGC-Argo); the monthly and yearly distribution is shown in Figure 2. More than 80 floats per months have been operated simultaneously in the basins in 2020 and more than 5500 profiles have been acquired (up to September 2020) by different float models (Figure 3).

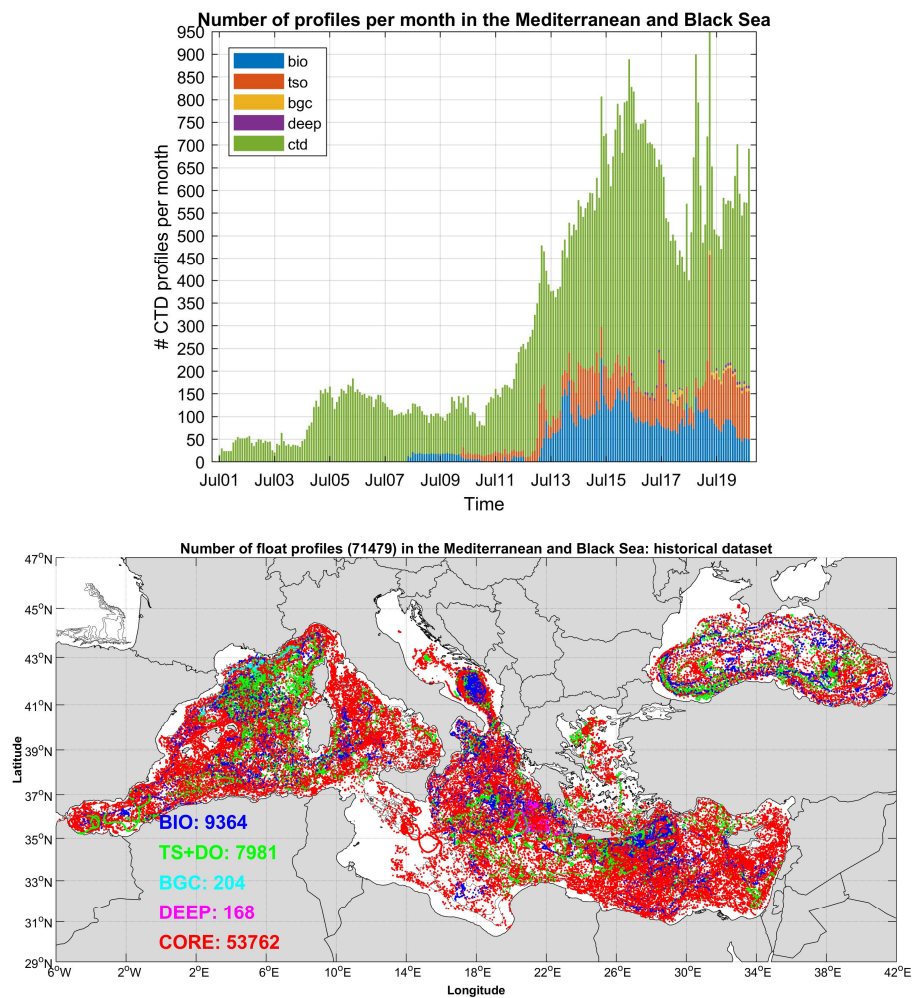


Figure 1. Temporal (upper panel) and spatial (bottom panel) distribution of float profiles in the Mediterranean and Black Sea between 2001 and 2020.

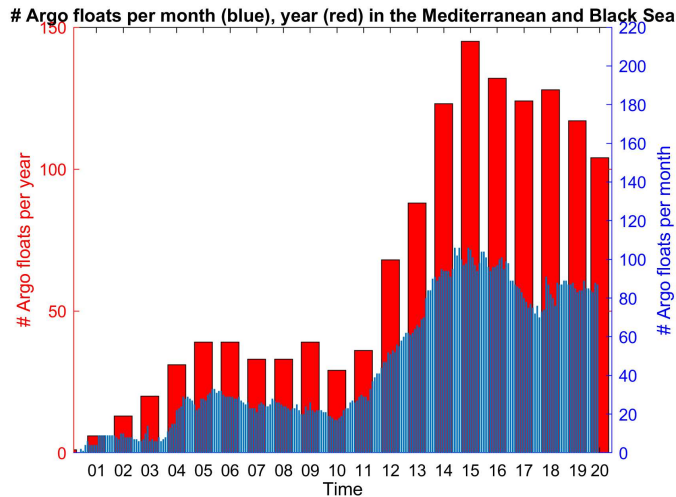


Figure 2. Monthly (blue bars) and yearly (red bars) distribution of Argo floats in the Mediterranean and Black Sea between 2001 and 2020.

The number of profiles acquired by Argo-extension floats in 2020 is about 1700 whilst the ones collected by the core Argo floats are about 3800. EU, Spain, Greece, France and Italy contributed to maintain/increase the Argo population in 2020: a total of 29 new floats have been deployed both in the Mediterranean and in the Black Seas (Figure 3); 26 out of 29 platforms are core-Argo, 2 are core-Argo with DO and 1 is a Bio-Argo. The deployment strategy was chosen according to project's targets and to replace dead floats or under-sampled areas.

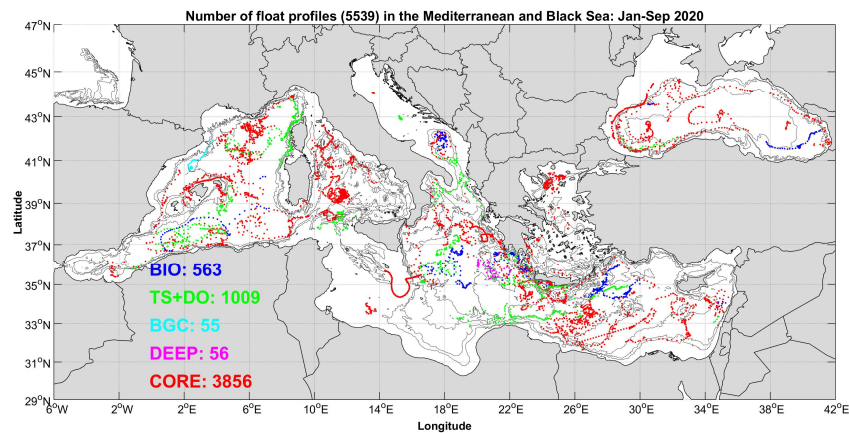


Figure 3. Spatial distribution of profiles collected by Argo floats in 2020 in the Mediterranean and Black Sea: locations are color-coded per float type.

Statistics have been computed to assess the fleet performance. The survival rate diagram produced are separated by transmission mode (figure 4). The maximum operating life is

more than 500 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 500 km, whilst the mean distance travelled is about 125 km. The balance of the population is in figure 5a and the annual dead rate in figure 5b.

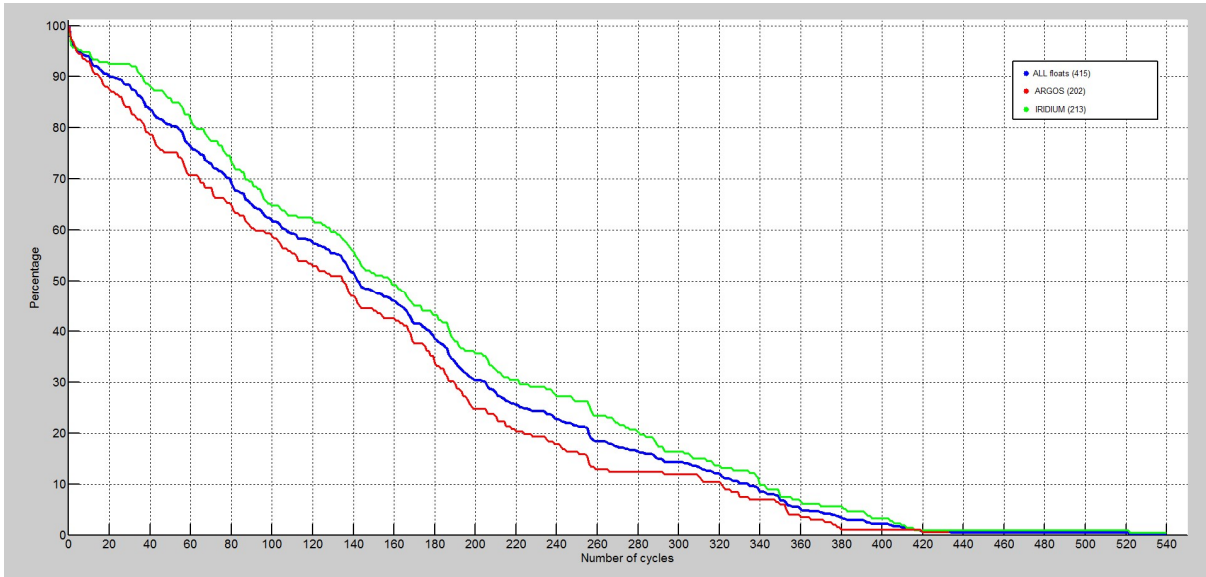


Figure 4a. Survival rate diagrams separated by telemetry system.

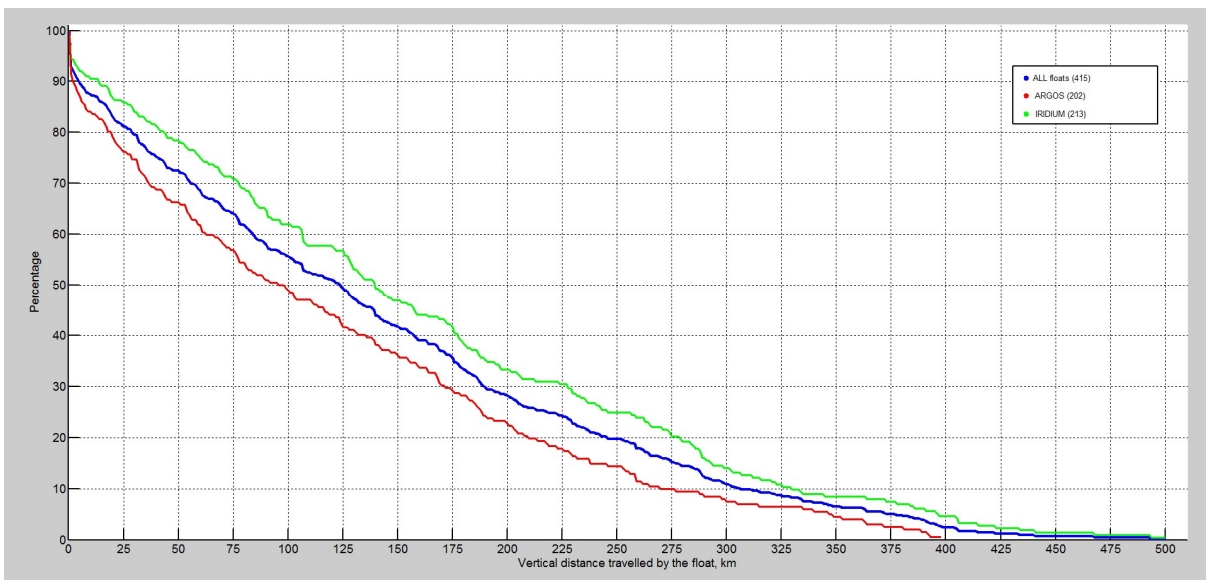


Figure 4b. Diagram of the vertical distance travelled floats, separated by telemetry system.

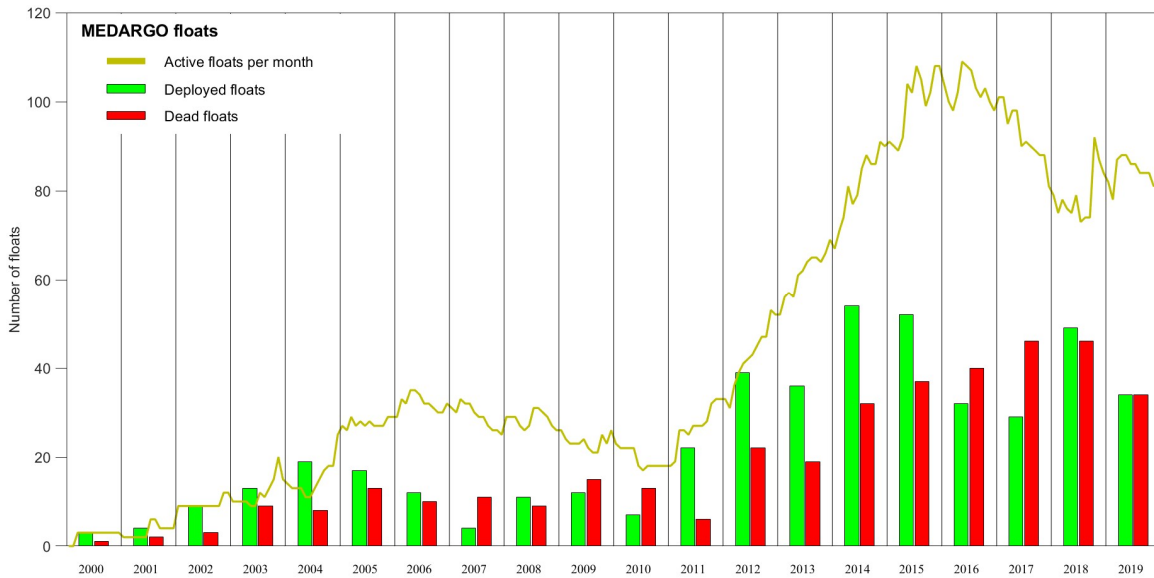


Figure 5a. Balance of the population (rate of population change related to the number of yearly deployments and dead floats).

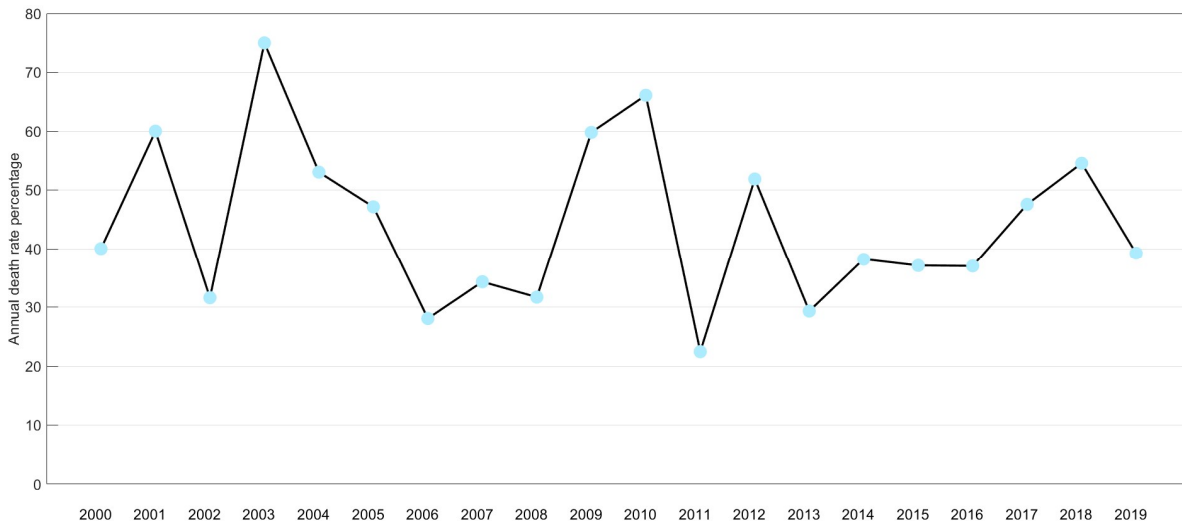
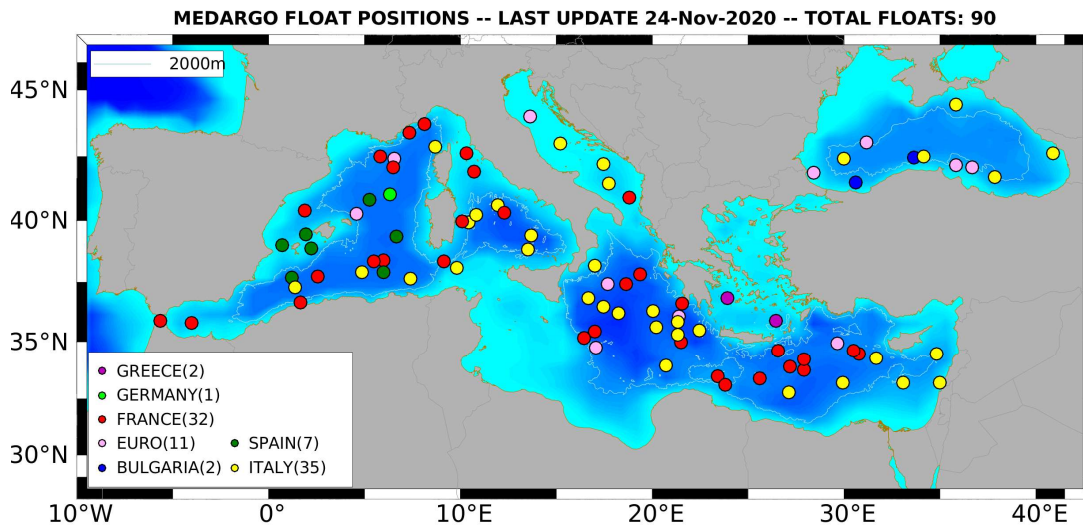


Figure 5b. Annual dead rate (ration between yearly failure and yearly average population).

- **Web pages:**

In the MedArgo web page (<http://nettuno ogs.trieste.it/sire/medargo/active/index.php>) tables and graphics are updated in near real time. The floats deployed during 2020 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.



- **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).

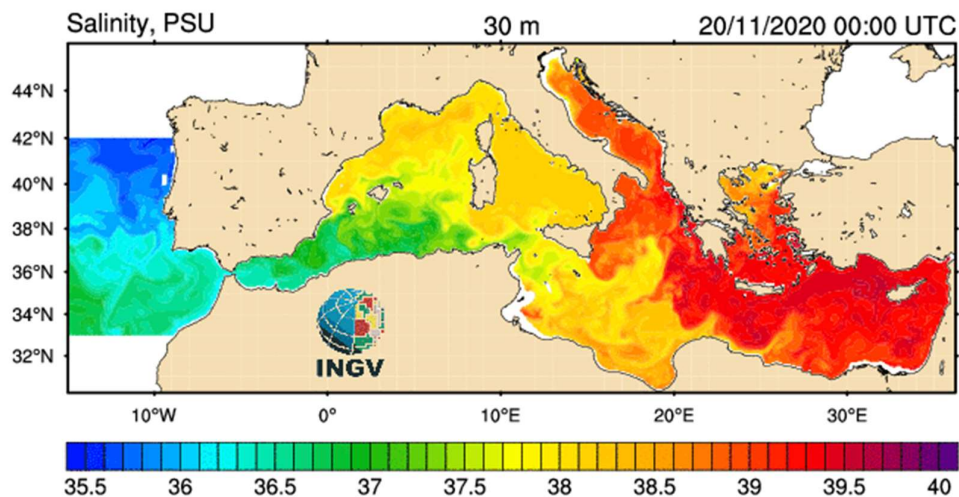


Figure 7. Forecasting model of salinity at 30 meters.

- d. An operational validation system has been developed by SOCIB to systematically assess the model outputs at daily, monthly and seasonal time scales. Multi-platform observations including in-situ measurements (Argo floats included) are used for this systematic validation (figure 8).

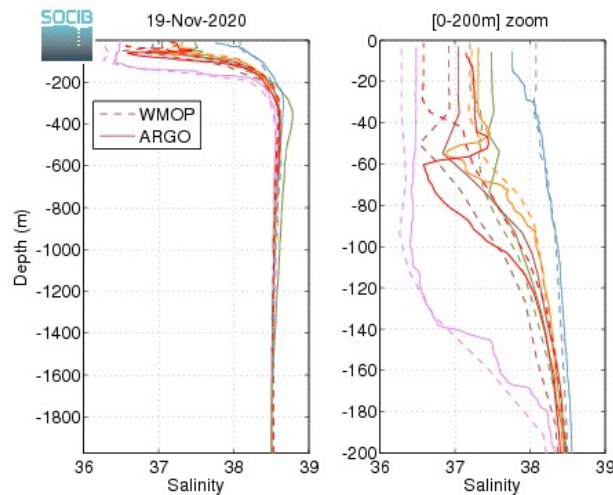


Figure 8. Operational validation system run at SOCIB.

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.

- Impact of the fast salty drift issue at EU level: analysis of affected floats have been conducted and results/comments are reported at: <https://docs.google.com/spreadsheets/d/1TA7SAnTiUvCK7AyGtSTUq3gu9QFbVdONj9M9zAq8CJU/edit#gid=1096144849>.
- The DMQC method has been applied to about 50% (as of October 2020) of the eligible floats deployed between 2001 and mid 2019 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). The DMQC work has been proceeding slowly since two years due to a lack of personnel. A new

scientist has been hired in October 2020 and she is currently on training. We expect to be fully operational during next year.

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 29 new floats have been deployed in the Mediterranean and Black Sea during 2020, through a coordinated activity of deployment opportunities and thanks to scientific projects.
- There are 79 active Argo floats in the Mediterranean Sea and 11 in the Black Sea as of 24 November 2020.
- The main MedArgo partners (Greece, Spain, France and Bulgaria) have been contacted by OGS (Italy) to strengthen the collaboration to improve the Argo activities (deployment plans and opportunities, sharing reference datasets for QC, sharing expertise, Argo products preparation). A virtual meeting will follow next year.