

Argo-España

Parte de la estrategia global de observación del océano



Report on Argo float deployments of *POSEIDON* cruise

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Argo float deployment for
**WMO 6901257, 6901259, 6901268 and
6901272.**

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1. Deployment design

Following the Argo program goals, the float density criteria demands a coverage distribution of $3^{\circ} \times 3^{\circ}$ grid cells (Fig. 1). Due to many causes, there currently are ocean areas with lack of observations, as it happens in the Southern Ocean and South Atlantic Ocean. There are still gaps with 0 observations/month. Argo deployments in areas as the South Atlantic Ocean, become crucial to extend the network and cover this lack of observations. In order to maintain the global Argo network coverage and taking in account the current distribution of the Argo floats, Argo España planned 4 float deployments in the South Atlantic ocean.

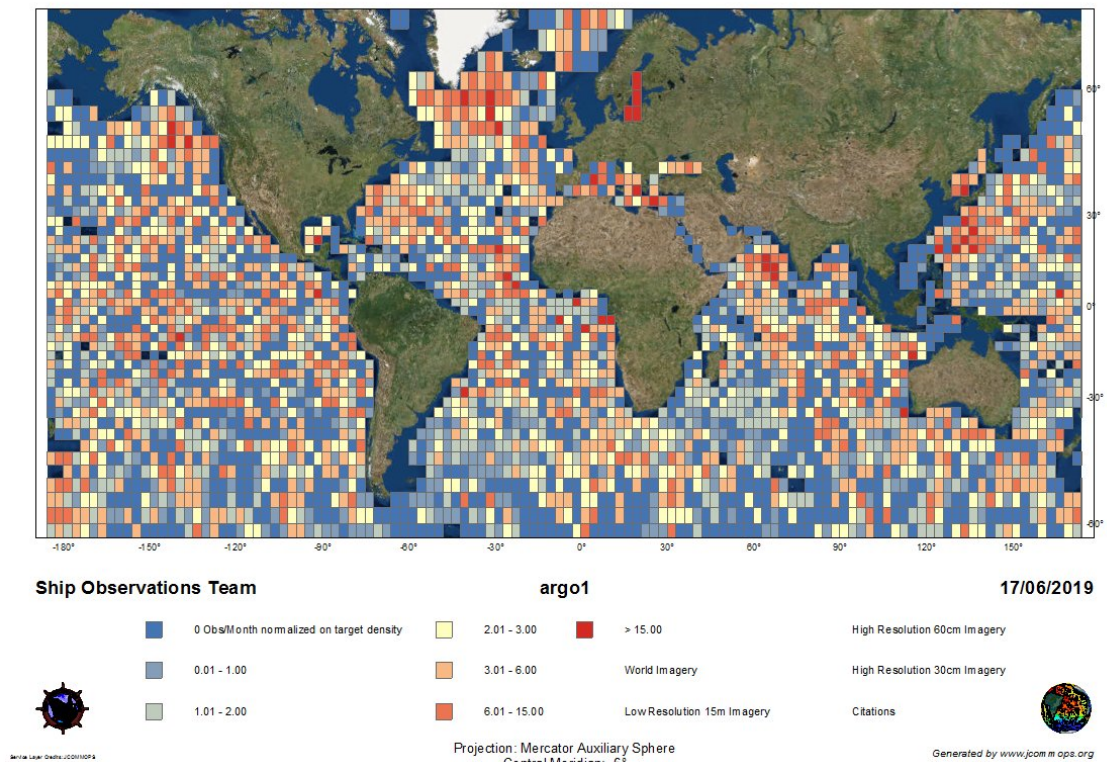


Figure 1. Density of Argo observations in the 2019 May vs the Argo 2020 challenge. Deployments in the South Atlantic Ocean are needed if density observations goals want to be reached.

As PI of the *POSEIDON* cruise, Jesús Arrieta (Spanish Oceanographic Institution - IEO) was requested to lead the Argo deployments planning. The R/V Sarmiento de Gamboa was planned to carry out the research at the South West Atlantic Ocean. The survey included 4 ideal locations to cover the dramatic lack of observations per area, one of them slightly further north of the equator.

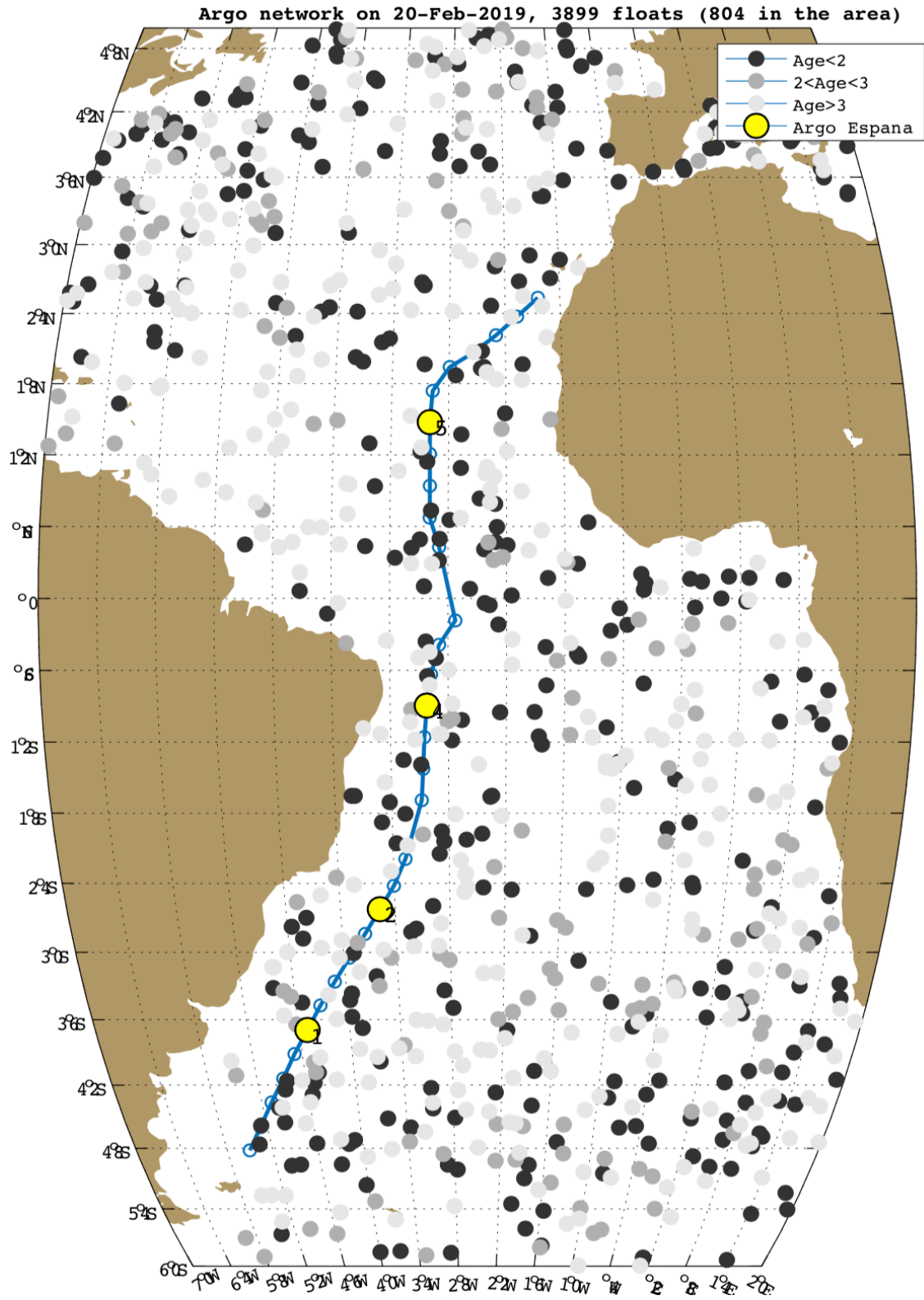


Figure 2. Argo's deployment plan for the *POSEIDON* cruise.

2. Deployment data

Information of each float deployment is showed in this paragraph.

- a. **WMO 6901257**. The following table contains all the data of the WMO 6901257 deployment during *POSEIDON* cruise. No troubled issues during the deployment were reported. CTD cast is available at the deployment location. Coriolis was notified on March 7, 2019 and all the information was registered at the Argo Information Center database. The data is free and publicly available through the Argo data stream:

<http://www.oceanografia.es/argo/datos/ArgoEsGraficos/6901257.html>

DATE AND TIME	2018 - 03 - 06 / 23:48 UTC
DEPLOYMENT LOCATION	-37°18.995' S -45°19.631' W
DEPLOYMENT PLATFORM	R/V Sarmiento de Gamboa
CRUISE ID	<i>POSEIDON</i>
FLOAT OWNER	IEO
PLATFORM TYPE	NKE Arvor - L
SERIAL NUMBER	AL2500-17SP006
TRANSMISSION SYSTEM	ARGOS
PARKING DEPTH (m)	1000
PROFILE FEPTH (m)	2000
DEPLOYMENT DEPTH (m)	5000
WEATHER CONDITIONS	<i>Light wind – rippled surface</i>
DEPLOYMENT OPERATOR	Eugenio Fraile – Alba González

Table 1. WMO 6901257 information deployment.

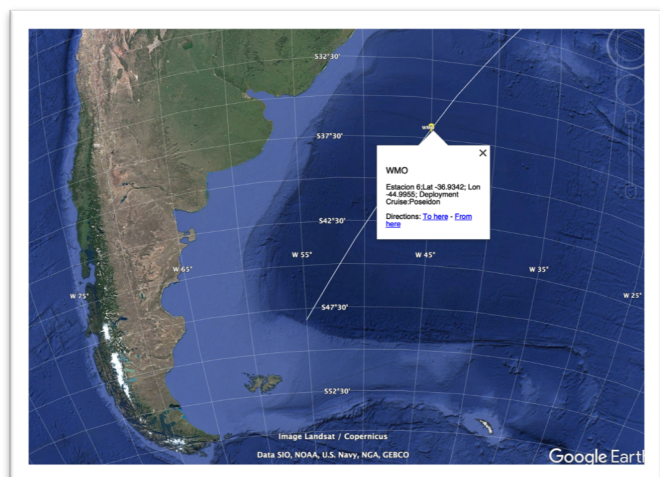


Figure 3 (a) and Figure 3 (b). R/V Sarmiento de Gamboa's staff and scientific crew during the deployment maneuver of the float WMO 6901257 (a). Deployment location (yellow spot) (b).

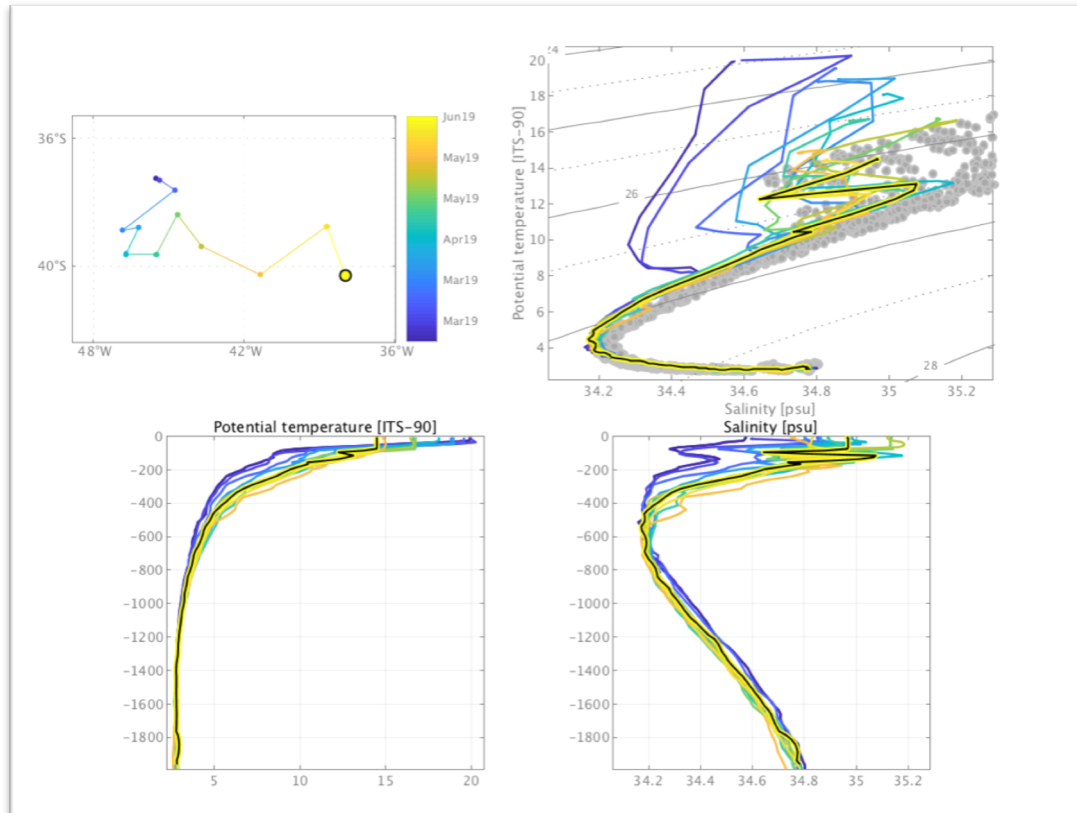


Figure 4. The trajectory of the float since the deployment is showed in the upper left side of the picture. T-S diagram of the data collected by WMO 6901257 is showed in the upper right side of the picture. The grey points are the climatology of the area. The black line is the first profile carried out by the float. The dark blue dashed line describes the CTD cast carried out from the R/V Sarmiento de Gamboa. Potential Temperature and Salinity profiles are also shown in the lower side on the picture.

- b. **WMO 6901259**. The following table contains all the data of the WMO 6901259 deployment during *POSEIDON* cruise. No troubled issues during the deployment were reported. CTD cast is available at the deployment location. Coriolis was notified on March 29, 2018 and all the information was registered at the Argo Information Center database. The data is free and publicly available through the Argo data stream:

<http://www.oceanografia.es/argo/datos/ArgoEsGraficos/6901259.html>

DATE AND TIME	2019 - 03 - 11 / 12:20 UTC
DEPLOYMENT LOCATION	-26° 40.7185' S -36° 02.274' W
DEPLOYMENT PLATFORM	R/V Sarmiento de Gamboa
CRUISE ID	<i>POSEIDON</i>
FLOAT OWNER	IEO
PLATFORM TYPE	NKE Arvor - L
SERIAL NUMBER	AI2500-17SP008
TRANSMISSION SYSTEM	ARGOS
PARKING DEPTH (m)	1000
PROFILE FEPTH (m)	2000
DEPTH	5000
WEATHER CONDITIONS	<i>Light wind - rippled surface</i>
DEPLOYMENT OPERATOR	Jesús Arrieta - Eugenio Fraile

Table 2. WMO 6901259 information deployment.

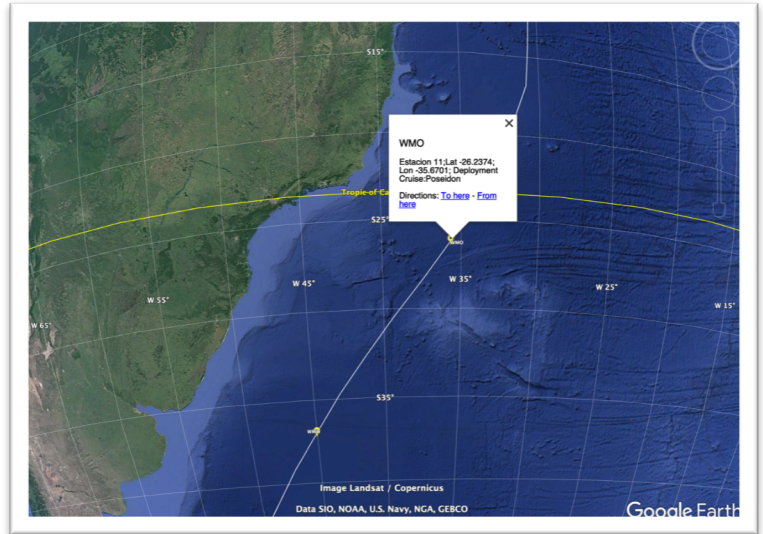
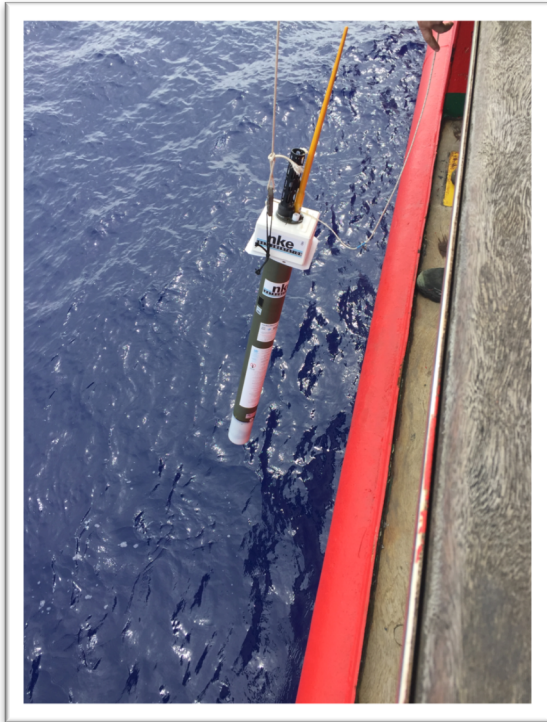


Figure 5 (a) and Figure 5 (b). R/V Sarmiento de Gamboa's staff during the deployment maneuver of the float WMO 6901259 (a). Deployment location (yellow spot) (b).

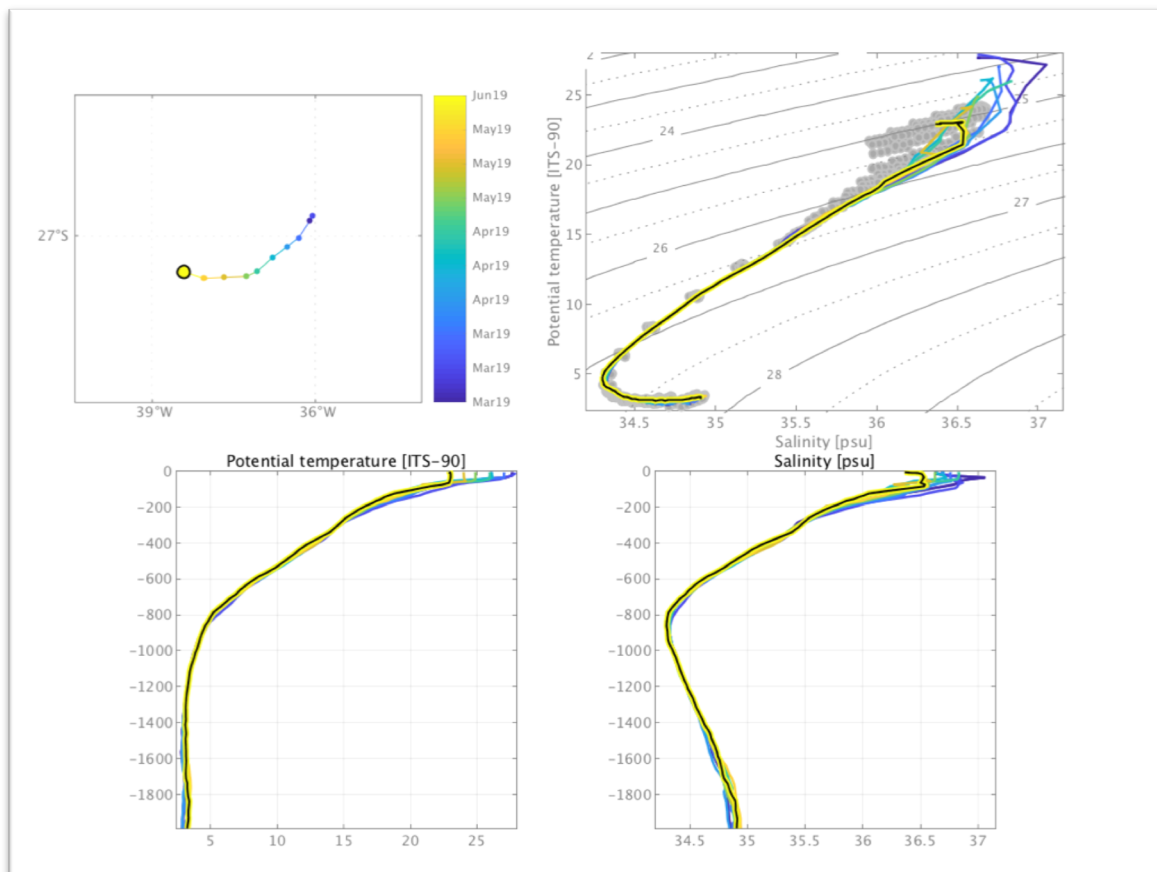


Figure 6. The trajectory of the float since the deployment is showed in the upper left side of the picture. T-S diagram of the data collected by WMO 6901259 is showed in the upper right side of the picture. The grey points are the climatology of the area. The black line is the first profile carried out by the float. The dark blue dashed line describes the CTD cast carried out from the R/V Sarmiento de Gamboa. Potential Temperature and Salinity profiles are also shown in the lower side on the picture.

c. **WMO 6901268.** The following table contains all the data of the WMO 6901268 deployment during *POSEIDON* cruise. No troubled issues during the deployment were reported. CTD cast is available at the deployment location. Coriolis was notified on April 5, 2019 and all the information was registered at the Argo Information Center database. The data is free and publicly available through the Argo data stream:

<http://www.oceanografia.es/argo/datos/ArgoEsGraficos/6901268.html>

DATE AND TIME	2018 - 03 - 18 / 09:00 UTC
DEPLOYMENT LOCATION	-09° 27.238' S -30° 15.726' W
DEPLOYMENT PLATFORM	R/V Sarmiento de Gamboa
CRUISE ID	<i>POSEIDON</i>
FLOAT OWNER	IEO
PLATFORM TYPE	NKE Arvor - L
SERIAL NUMBER	A12500-17SP017
TRANSMISSION SYSTEM	ARGOS
PARKING DEPTH (m)	1000
PROFILE FEPTH (m)	2000
DEPTH	5000
WEATHER CONDITIONS	<i>Light wind - rippled surface</i>
DEPLOYMENT OPERATOR	Eugenio Fraile - Alba González

Table 3. WMO 6901268 information deployment.



Figure 7 (a) and Figure 7 (b). R/V Sarmiento de Gamboa's staff during the deployment maneuver of the float WMO 6901268 (a). Deployment location (yellow spot) (b).

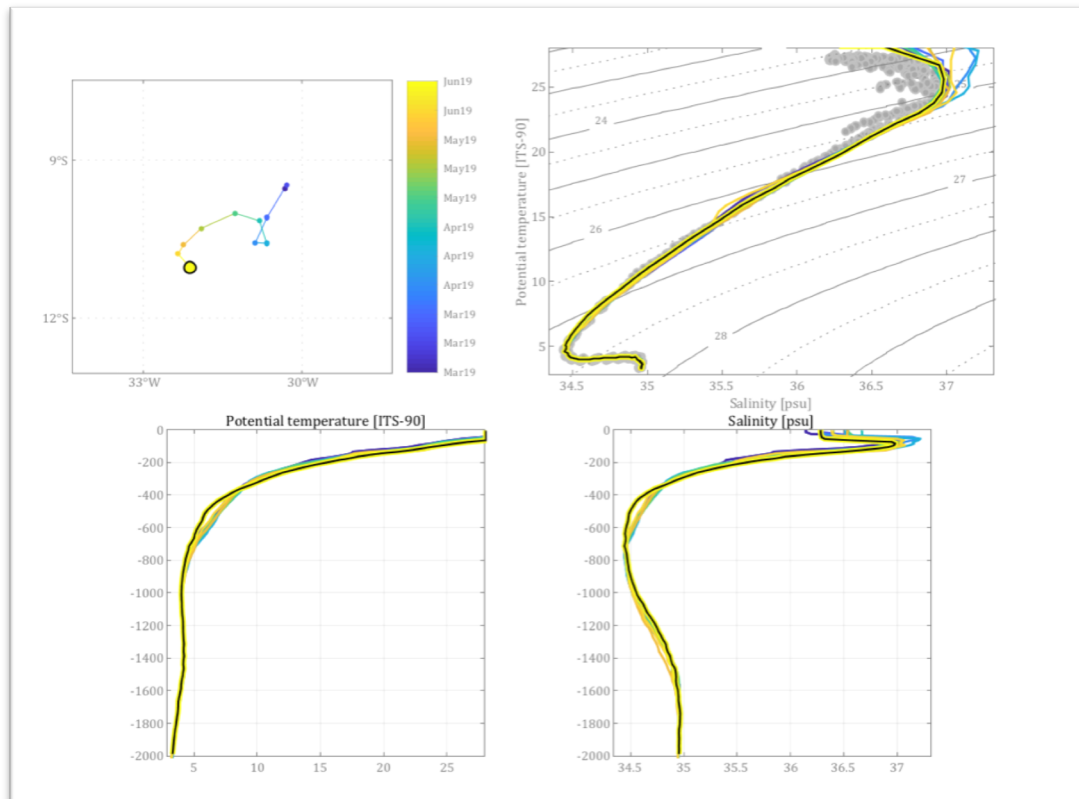


Figure 8. The trajectory of the float since the deployment is showed in the upper left side of the picture. T-S diagram of the data collected by WMO 6901268 is showed in the upper right side of the picture. The grey points are the climatology of the area. The black line is the first profile carried out by the float. The dark blue dashed line describes the CTD cast carried out from the R/V Sarmiento de Gamboa. Potential Temperature and Salinity profiles are also shown in the lower side on the picture.

- d. **WMO 6901272.** The following table contains all the data of the WMO 6901272 deployment during *POSEIDON* cruise. No troubled issues during the deployment were reported. CTD cast is available at the deployment location. Coriolis was notified on April 5, 2019 and all the information was registered at the Argo Information Center database. The data is free and publicly available through the Argo data stream:

<http://www.oceanografia.es/argo/datos/ArgoEsGraficos/6901272.html>

DATE AND TIME	2019 - 03 - 26 / 10:45 UTC
DEPLOYMENT LOCATION	-13°41.509' N -29°42.787' W
DEPLOYMENT PLATFORM	R/V Sarmiento de Gamboa
CRUISE ID	<i>POSEIDON</i>
FLOAT OWNER	IEO
PLATFORM TYPE	NKE Arvor - L
SERIAL NUMBER	AL2500-17SP021
TRANSMISSION SYSTEM	ARGOS
PARKING DEPTH (m)	1000
PROFILE FEPTH (m)	2000
DEPLOYMENT DEPTH (m)	5000
WEATHER CONDITIONS	<i>Light wind – rippled surface</i>
DEPLOYMENT OPERATOR	Eugenio Fraile – Alba González

Table 4. WMO 6901272 information deployment.



Figure 9 (a) and Figure 9 (b). R/V Sarmiento de Gamboa's staff during the deployment maneuver of the float WMO 6901272 (a). Deployment location (yellow spot) (b).

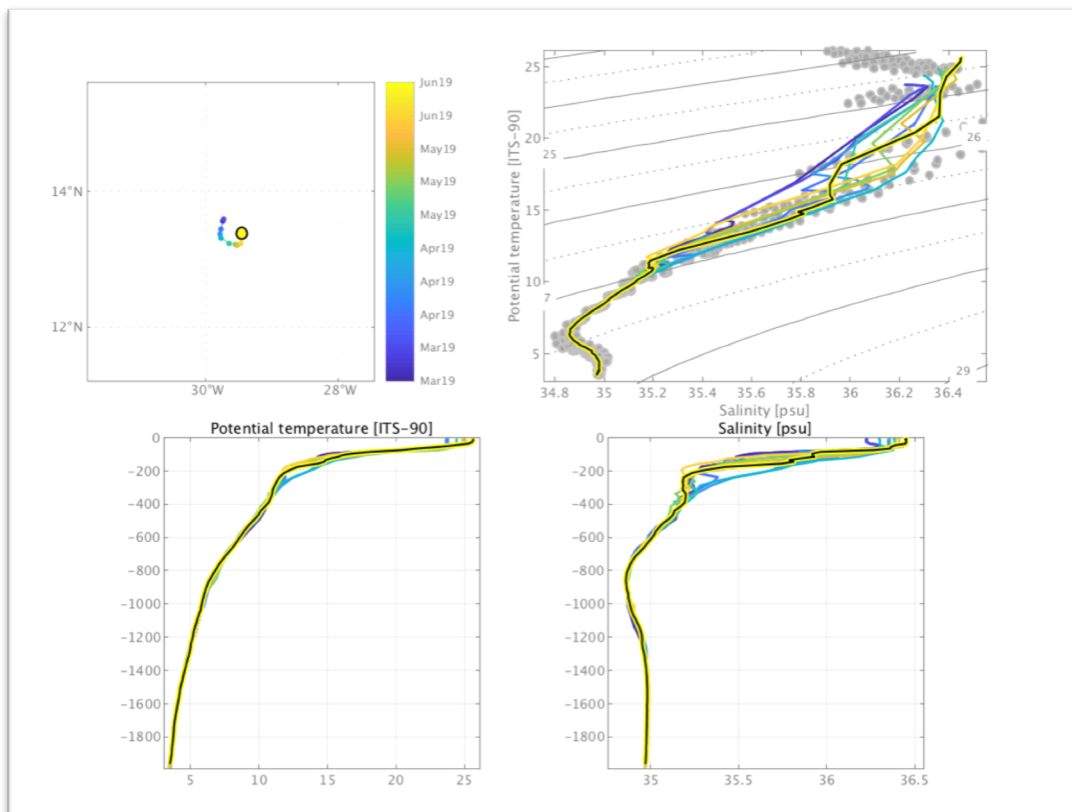
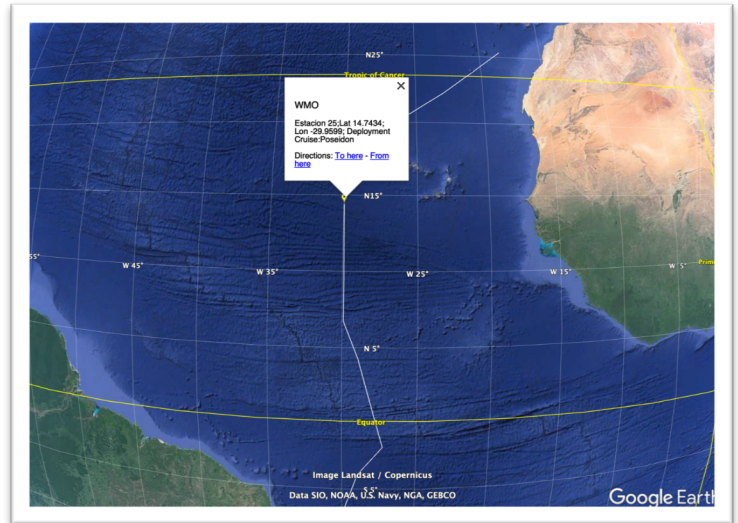


Figure 10. The trajectory of the float since the deployment is showed in the upper left side of the picture. T-S diagram of the data collected by WMO 6901272 is showed in the upper right side of the picture. The grey points are the climatology of the area. The black line is the first profile carried out by the float. The dark blue dashed line describes the CTD cast carried out from the R/V Sarmiento de Gamboa. Potential Temperature and Salinity profiles are also shown in the lower side on the picture.

D. Floats configuration

Floats configuration was set as default by NKE for all the floats. “MC” parameters (table 5) were set according to the scientific requirements and the oceanographic area of study (Atlantic Ocean). The floats will dive up to 2000 m depth carrying out cycles of 10 days, with a parking depth of 1000 m.

Command no.	Name	Default Value	Units
Mission Commands			
MC0	Total Number of Cycles	300	Whole number
MC1	Number of cycle with “Cycle Period 1”	300	
MC2	Cycle Period 1	240	Hours
MC3	Cycle Period 2	240	Hours
MC4	Reference Day	2	Number of days
MC5	Estimated time at the surface	6	Hours
MC6	Delay Before Mission	0	Minutes
MC7	Descent Sampling Period	0	Seconds
MC8	Drift Sampling Period	12	Hours
MC9	Ascent Sampling Period	10	Seconds
MC10	Drift Depth for “MC1” first cycles	1000	dBar
MC11	Profile Depth for “MC1” first cycles	2000	dBar
MC12	Drift Depth after “MC1” cycles are done	1000	dBar
MC13	Profile Depth after “MC1” cycles are done	2000	dBar
MC14	Threshold surface/Intermediate Pressure	10	dBar
MC15	Threshold Intermediate /bottom Pressure	200	dBar
MC16	Thickness of the surface slices	1	dBar
MC17	Thickness of the intermediate slices	10	dBar
MC18	Thickness of the bottom slices	25	dBar
MC19	Iridium End Of life period (UNUSED)	60	Minutes
MC20	2 nd Iridium Session Wait Period (UNUSED)	0	Minutes
MC21	Grounding mode (0= Shift, 1 : Stay grounded)	0	
MC22	Grounding switch pressure	50	dBar
MC23	Delay at surface if grounding at surface	1	Minutes
MC24	Ontode type (0: none, 1 : 4330, 2 : 3830)	0	

Table 5. Configuration sheet for all the floats deployed during *POSEIDON* cruise.

E. Acknowledgements

Argo España would like to thank Jesús Arrieta, Eugenio Fraile, Alba González and the crew of the R/V Sarmiento de Gamboa, who cooperated for the success of the mission. These Argo floats have been co - financed by FEDER funds from “*Programa Operativo Crecimiento Inteligente 2014 - 2020*”.