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MOCCA

D3.2.2 Revised Deployment Plan for 2017-2018

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Organisation/Natural person	Represented by	Statute	Contributing entities[1]
Euro-Argo ERIC	N/A	Coordinator	N/A
The French Republic	Ifremer	Member	SHOM, INSU/CNRS, Meteo-France, IRD, IPEV
The Federal Republic of Germany	BSH	Member	GEOMAR, University of Hamburg, Alfred-Wegener-Institute for Polar and Marine Research (AWI)
The Hellenic Republic	HCMR	Member	N/A
The Italian Republic	OGS	Member	N/A
The Kingdom of the Netherlands	KNMI	Member	N/A
The Republic of Finland	FMI	Member	N/A
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Document History

Version[2]	Issue Date	Stage	Content and Changes
0.1	01.08.2017	Draft	Initial document creation
0.2	15.09.2017	Draft	Revision
0.3	15.11.2017	QC	For internal quality control
1.0	01.12.2017	Final	Final version for submission
2.0	27.04.2018	Update	Updated version with all deployments of 2017

[1] As indicated in the "Technical and Scientific description of the Euro-Argo ERIC" July 2013 attached to the Euro-Argo Statutes.

[2] Integers correspond to submitted versions.

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1. INTRODUCTION

This document is a revision of the deliverable D3.2.1 Deployment Plan for 2016-2017.

Floats are considered ready for deployment once they have passed the acceptance tests, as defined in the procedure and tests reports[3]. Shipment of floats is organized according to float reception dates, acceptance tests dates and cruise planning.

The deployment plan for MOCCA floats is build according to the strategy detailed in the above-mentioned document. This is mainly based on the following elements:

- Recommendations from the "Strategy for the evolution of European contribution to Argo for the next decade" document;
- National plans;
- Argo density/age maps (from JCOMMOPS and Argo Information Centre);
- Cruises opportunities from partners and others;
- Recommendations from STAG (Euro-Argo Scientific and Technical Advisory Group).

[3] See MOCCA deliverables "D3.1.1 Acceptance test description" and "D3.1.2 Set1 Acceptance Test Report".

2. STATUS MAP

The map below summarizes 2016 and 2017 deployments and presents some of the planned deployment locations for 2018. It is expected that all MOCCA floats will be deployed before the end of 2018.

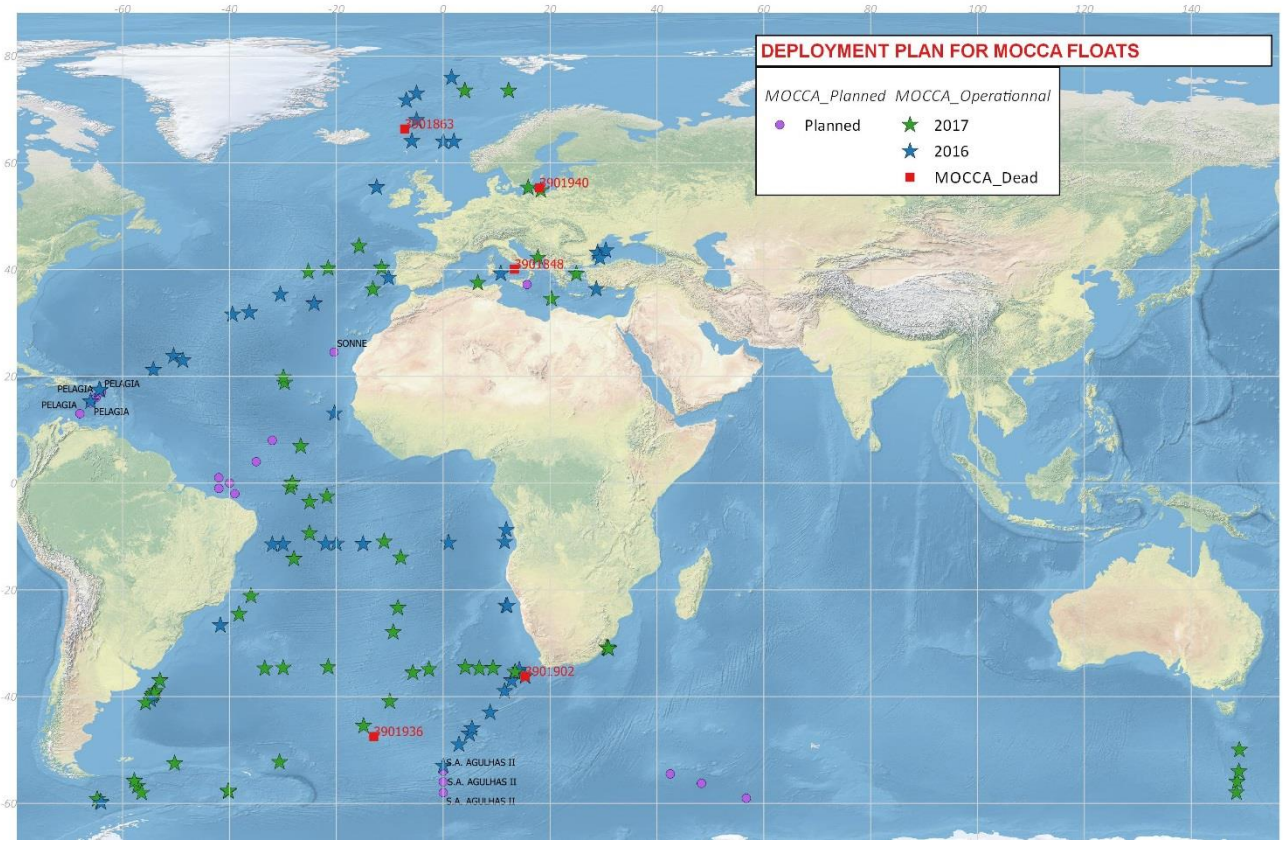


Figure 1: MOCCA deployment locations as of end of 2017.

3. STATUS TABLE

The table below summarizes 2016 and 2017 deployments (121 in total):

WMO	Ship	Cruise	Deployment date	Latitude	Longitude
3901840	FS METEOR	M127	29/05/2016	22.97	-48.73
3901848	BELLE POULE	MED	04/06/2016	40.08	13.34
3901849	BELLE POULE	MED	05/06/2016	39.26	10.77
3901850	OCEANIA	AREX2016	24/06/2016	73.51	12.24
3901839	FS METEOR	M127	25/06/2016	31.95	-36.28
3901851	OCEANIA	AREX2016	25/06/2016	73.53	4.04
3901845	FS METEOR	M127	26/06/2016	35.34	-30.49
3901841	FS METEOR	M129	31/07/2016	33.6	-24.2
3901856	PELAGIA	PELAGIA_TR	09/08/2016	31.6	-39.5
3901862	Beautemps-Beaupré	NARVAL	11/08/2016	64.1	-5.9
3901857	PELAGIA	PELAGIA_TR	12/08/2016	23.8	-50.5
3901863	Beautemps-Beaupré	NARVAL	12/08/2016	66.3	-7.2
3901858	PELAGIA	PELAGIA_TR	14/08/2016	21.2	-54.2
3901874	HAAKON MOSBY	2016618	22/08/2016	76.0	1.6
3901838	FS METEOR	M129	23/08/2016	13.1	-20.4
3901872	HAAKON MOSBY	2016618	23/08/2016	71.7	-6.9
3901875	HAAKON MOSBY	2016618	23/08/2016	73.0	-5.0
3901871	CELTIC VOYAGER	CV16030	29/08/2016	55.4	-12.5
3901859	PELAGIA	64PE614	01/09/2016	17.5	-64.4
3901873	HAAKON MOSBY	2016618	04/09/2016	68.0	-5.0
3901860	PELAGIA	64PE614	05/09/2016	17.3	-64.2
3901861	PELAGIA	64PE614	06/09/2016	15.3	-66.0
3901864	Beautemps-Beaupré	NARVAL	08/09/2016	64.0	2.0
3901865	Beautemps-Beaupré	NARVAL	08/09/2016	64.0	0.0
3901842	FS METEOR	M131	08/10/2016	-11.5	-32.0
3901843	FS METEOR	M131	09/10/2016	-11.5	-30.0
3901867	FS METEOR	M131	11/10/2016	-11.4	-22.0
3901868	FS METEOR	M131	12/10/2016	-11.4	-20.0
3901844	FS METEOR	M131	13/10/2016	-11.4	-15.0
3901866	FS METEOR	M131	17/10/2016	-11.2	1.0
3901876	PLANCIUS	KNMI	17/10/2016	-26.7	-41.7
3901846	FS METEOR	M131	20/10/2016	-11.0	11.5
3901877	PLANCIUS	KNMI	21/10/2016	-40.6	-54.7
3901847	FS METEOR	M131	22/10/2016	-8.8	11.8
3901855	BULGARIA	BLACK SEA	22/10/2016	43.1	28.9
3901853	TURKEY	CILICIAN BASIN	28/10/2016	36.3	28.7
3901854	ROMANIA	BLACK SEA	02/11/2016	43.6	30.4
3901869	FS METEOR	EEZ	10/11/2016	-23.0	12.0

3901870	FS METEOR	EEZ	10/11/2016	-23.0	11.7
3901918	SA Agulhas II	SANAE	01/12/2016	-35.0	14.3
3901919	SA Agulhas II	SANAE	01/12/2016	-37.0	12.8
3901920	SA Agulhas II	SANAE	02/12/2016	-39.0	11.5
3901923	SA Agulhas II	SANAE	03/12/2016	-43.0	8.8
3901924	SA Agulhas II	SANAE	04/12/2016	-46.0	5.4
3901925	SA Agulhas II	SANAE	04/12/2016	-47.0	4.9
3901927	SA Agulhas II	SANAE	05/12/2016	-49.0	2.9
3901852	TURKEY	BLACK SEA	06/12/2016	42.2	29.3
3901928	SA Agulhas II	SANAE	06/12/2016	-53.0	0.0
3901901	METEOR	M133	16/12/2016	-36.2	15.3
3901902	METEOR	M133	16/12/2016	-36.2	15.3
3901903	METEOR	M133	16/12/2016	-36.2	15.3
3901885	PLANCIUS	KNMI	19/12/2016	-59.9	-64.0
3901909	NORUEGA	IPMA	29/12/2016	38.4	-10.2
3901935	MARIA S MERIAN	MSM60	08/01/2017	-34.7	9.3
3901937	MARIA S MERIAN	MSM60	09/01/2017	-34.8	6.8
3901934	MARIA S MERIAN	MSM60	10/01/2017	-34.5	4.1
3901931	MARIA S MERIAN	MSM60	19/01/2017	-34.5	-21.5
3901907	BTBP	PROTEUS	21/01/2017	37.5	6.5
3901881	PLANCIUS	KNMI	22/01/2017	-52.5	-50.3
3901899	OGS EXPLORA	Tasmania - Ross Sea	22/01/2017	-50.0	149.0
3901929	MARIA S MERIAN	MSM60	22/01/2017	-34.6	-30.0
3901905	OGS EXPLORA	Tasmania - Ross Sea	23/01/2017	-54.1	148.9
3901900	OGS EXPLORA	Tasmania - Ross Sea	24/01/2017	-58.0	148.5
3901904	OGS EXPLORA	Tasmania - Ross Sea	24/01/2017	-56.0	148.6
3901930	MARIA S MERIAN	MSM60	24/01/2017	-34.8	-33.4
3901908	BTBP	PROTEUS	25/01/2017	34.5	20.2
3901883	PLANCIUS	KNMI	28/01/2017	-57.8	-40.2
3901888	PLANCIUS	KNMI	25/02/2017	-57.7	-40.2
3901882	PLANCIUS	KNMI	04/03/2017	-59.7	-64.2
3901906	OGS EXPLORA	Tasmania - Ross Sea	10/03/2017	-60.1	159.5
3901886	PLANCIUS	KNMI	24/03/2017	-59.2	-64.8
3901879	PLANCIUS	KNMI	03/04/2017	-52.3	-30.6
3901890	POSEIDON	AEGEAN	03/04/2017	39.2	24.9
3901889	PLANCIUS	KNMI	06/04/2017	-43.5	-14.9
3901887	PLANCIUS	KNMI	13/04/2017	-28.0	-9.4
3901884	PLANCIUS	KNMI	14/04/2017	-23.4	-8.5
3901891	HESPERIDES	RETRO-BMC	14/04/2017	-39.9	-54.5
3901892	HESPERIDES	RETRO-BMC	14/04/2017	-39.6	-54.3
3901895	HESPERIDES	HESPERIDES_TR	14/04/2017	-41.2	-55.7
3901893	HESPERIDES	RETRO-BMC	15/04/2017	-39.4	-54.1
3901894	HESPERIDES	RETRO-BMC	15/04/2017	-39.0	-53.9
3901878	PLANCIUS	KNMI	19/04/2017	-14.0	-8.0

3901880	PLANCIUS	KNMI	20/04/2017	-11.0	-12.0
3901896	HESPERIDES	HESPERIDES_TR	24/04/2017	-37.0	-53.0
3901897	HESPERIDES	HESPERIDES_TR	10/05/2017	-0.9	-28.6
3901898	HESPERIDES	HESPERIDES_TR	10/05/2017	0.0	-28.3
3901911	OCEANIA	AREX2017	27/06/2017	73.5	4.1
3901910	OCEANIA	AREX2017	29/06/2017	73.5	12.2
3901978	Nase More	Adriatique	05/07/2017	42.2	17.7
3901964	SA Agulhas II	SEAmester Cruise	25/07/2017	-35.4	13.4
3901965	SA Agulhas II	SEAmester Cruise	25/07/2017	-35.4	13.4
3901912	ALGOA	ASCA	10/08/2017	-30.9	30.7
3901913	ALGOA	ASCA	10/08/2017	-31.0	30.9
3901914	ALGOA	ASCA	10/08/2017	-30.9	30.8
3901915	ALGOA	ASCA	10/08/2017	-31.0	30.8
3901916	ALGOA	ASCA	10/08/2017	-31.1	31.0
3901917	ALGOA	ASCA	10/08/2017	-30.8	30.6
3901939	SA Agulhas II	GOUGH	18/09/2017	-40.9	-10.0
3901936	SA Agulhas II	GOUGH	20/09/2017	-47.5	-13.0
3901942	TAMOURE	MARTIN	20/09/2017	36.3	-13.2
3901943	PIERRE DE FERMAT	ORANGE MARINE	20/09/2017	44.4	-15.8
3901940 **3902133**	OCEANIA	BALTIC	20/09/2017 06/11/2017	55.3 55.1	18.0 19.6
3901941	OCEANIA	BALTIC	21/09/2017	55.3	15.9
3901944	PIERRE DE FERMAT	ORANGE MARINE	22/09/2017	39.6	-25.3
3901951	RSS DISCOVERY	AMT27	28/09/2017	40.2	-21.5
3901952	RSS DISCOVERY	AMT27	05/10/2017	19.8	-29.9
3901953	RSS DISCOVERY	AMT27	05/10/2017	18.8	-29.7
3901938	SA Agulhas II	GOUGH	06/10/2017	-35.5	-5.7
3901922	SA Agulhas II	GOUGH	07/10/2017	-34.9	-2.7
3901954	RSS DISCOVERY	AMT27	09/10/2017	6.9	-26.7
3901955	RSS DISCOVERY	AMT27	13/10/2017	-3.5	-25.0
3901956	RSS DISCOVERY	AMT27	15/10/2017	-9.4	-25.0
3901926	PLANCIUS	PLANCIUS_TR	31/10/2017	-24.6	-38.2
3901933	PLANCIUS	PLANCIUS_TR	31/10/2017	-21.2	-36.0
3901945	PIERRE DE FERMAT	ORANGE MARINE	04/11/2017	40.3	-11.5
3901949	RRS James Clark Ross	JR17001	16/12/2017	-58.0	-56.4
3901948	RRS James Clark Ross	JR17001	17/12/2017	-56.8	-57.2
3901950	RRS James Clark Ross	JR17001	18/12/2017	-55.8	-57.8
3901972	FS SONNE	SO259-3	25/12/2017	24.5	-20.4
3902136	FS SONNE	SO259-3	30/12/2017	-2.5	-21.8

4. 2017 DEPLOYMENTS

In this section we detail all the deployments of 2017 (68).

4.1. South Atlantic

- 6 floats were deployed in January 2017 from the cruise MSM60 along the 34°S transect, a region particularly in deficit of floats in the global Argo network.

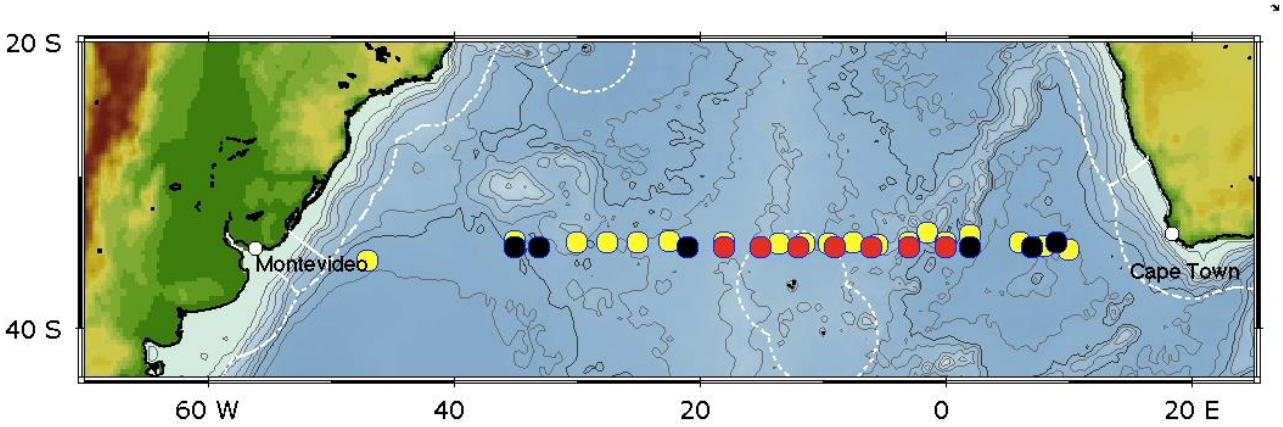


Figure 2: Map of the 6 MOCCA floats (in dark blue) deployed in the South Atlantic.

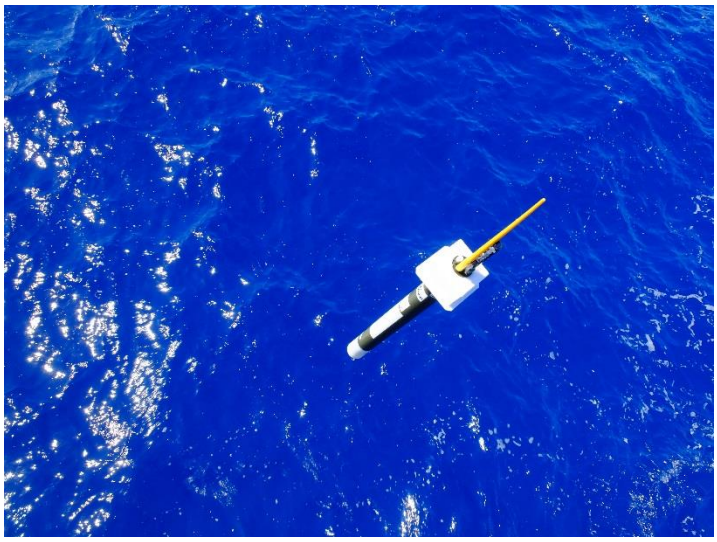


Figure 3: Picture of an ARGOS MOCCA float launched from the MARIA S MERIAN.

- 4 floats were also deployed during the transit of SA Agulhas II from Cape Town to Gough Island.
- 8 floats have been deployed from Spanish R/V HESPERIDES to study the Brazil-Malvinas Confluence region.
- 2 floats have been deployed from the SA Agulhas II during the SEAmester summer school cruise.

4.2. South Pacific

5 floats were deployed early 2017 in the Tasmania – Ross Sea, in the South Pacific, from the vessel OGS EXPLORA, as part of the Southern Ocean program.

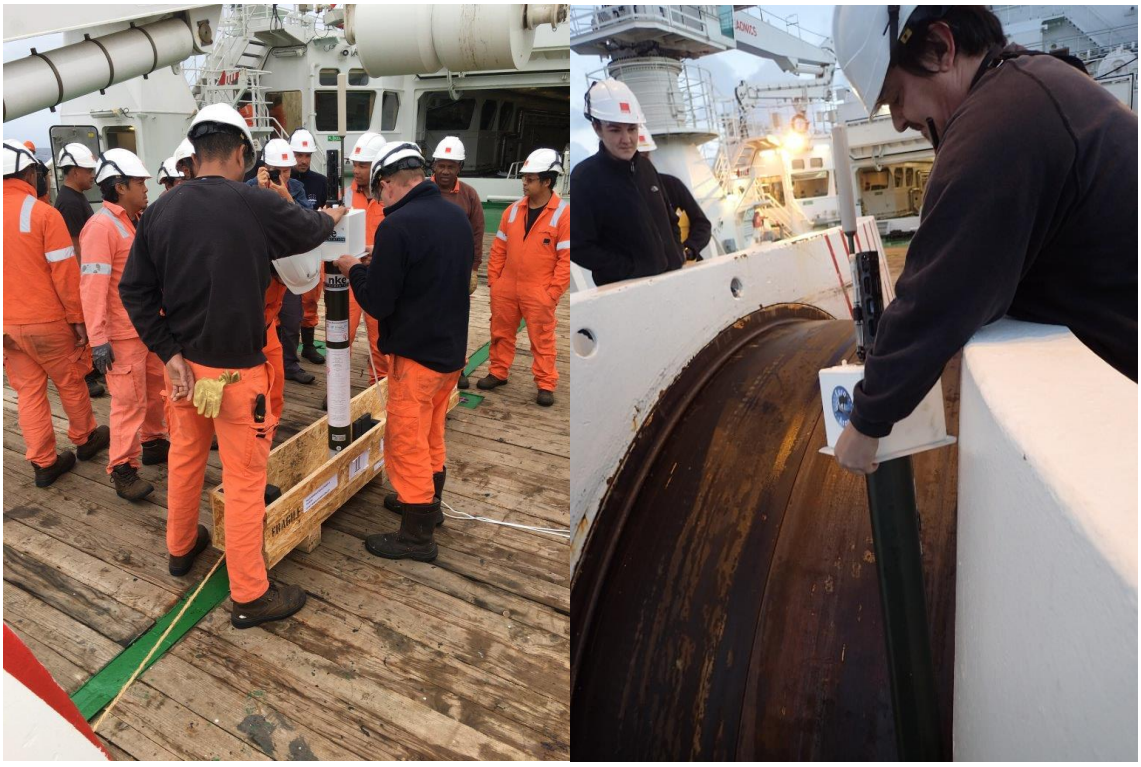
4.3. Ships of opportunity

- 13 floats were deployed in 2017 from the passenger veseel m/v Plancius (*https://oceanwide-expeditions.com/our-fleet/m-v-plancius*) during its route between Europe and South America, and navigation around Falklands Islands.

- 2 floats were deployed from the F/S SONNE during its transit from Brest to Buenos Aires (Atlantic).

- 1 float was deployed by the Ship Coordinator of JCOMMOPS around Portugal area.

- 3 floats were deployed from the cable ship Pierre de Fermat, during its transit to the Acores. This was made possible with the signature of a partnership between Euro-Argo and Orange Marine[4], that started with the MOCCA project and that both parties intend to pursue to be able to contribute to ocean observations in places were few vessels usually navigate.



[4] *https://www.orange.com/fr/Press-Room/communiques/communiques-2017/Orange-Marine-signe-un-partenariat-avec-Euro-Argo*

Figure 4: Crew of cable ship Pierre de Fermat (Orange Marine) examine deployment procedure (top left). Launch of one float in overseas (top right and bottom).

4.4. Transkei shelf ecosystem of South Africa

6 floats were deployed across the Agulhas Current in order to measure temperature, salinity, and infer flow characteristics of the Current as it flows along the Transkei shelf region. These floats, configured to profile the upper 1000 m on a daily basis, will not only add to and improve the number of Argo float profiles in Western Boundary Current systems, such as the Agulhas Current, but will also provide critical information on the characteristics of the waters forming the offshore boundary of the Transkei shelf ecosystem.

Complete story and pictures on http://www.euro-argo.eu/EU-Projects/MOCCA-2015-2020/News2/MOCCA-floats-in-the-Transkei-shelf-ecosystem-of-South-Africa

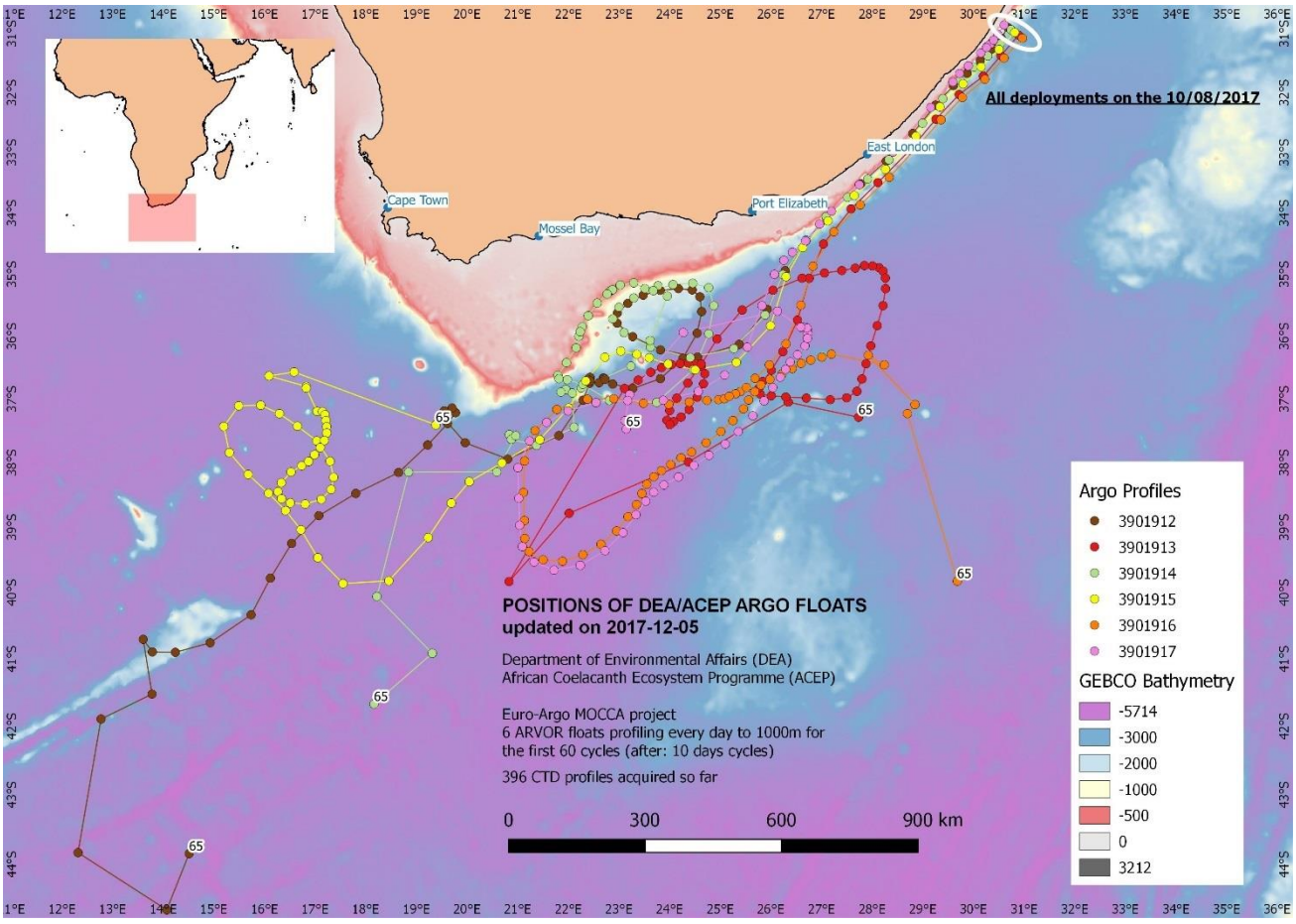


Figure 5: Deployments in the Agulhas Current

4.5. Atlantic Meridional Transect (AMT27)

6 MOCCA floats were deployed from the RSS DISCOVERY during its AMT transect. More on: http://www.euro-argo.eu/News-Meetings/News/News-archives/2017/Euro-Argo-deployments-during-the-AMT-2017-cruise

4.6. Drake Passage

In December 2017, 3 MOCCA floats were deployed in the Drake Passage during the annual occupation of GO-SHIP (Global Ocean Ship-based Hydrographic Investigations Program) section SR1b led by the UK National Oceanography Centre (NOC) as part of the ORCHESTRA (Ocean Regulation of Climate by Heat and Carbon Sequestration and Transports) programme funded by NERC (UK Natural Environment Research Council), that was conducted aboard the British Antarctic Survey (BAS) vessel RRS James Clark Ross.

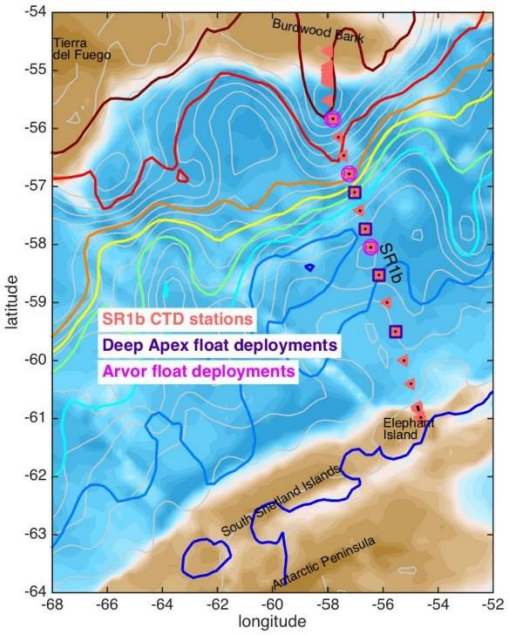


Figure 6: SR1b section - JR17001 cruise. MOCCA floats deployment locations are indicated with purple rounds.

4.7. Baltic Sea

In September 2017, 2 MOCCA floats were deployed in the Baltic Sea. This was the first time an ARVOR float was deployed in the Baltic, with its very specific oceanography conditions (shallow waters and low salinities). The Arvor was identified as a very promising candidate to test Argo floats in the Baltic due to its powerful hydraulic capabilities to dive and ascent in a wide range of water densities.

The floats were slightly modified by the ERIC technical team, adjusting buoyancy and setting up a special configuration to optimize the float behavior in shallow waters.

1 float was quickly recovered after deployment because it was drifting inland. It was then redeployed offshore.

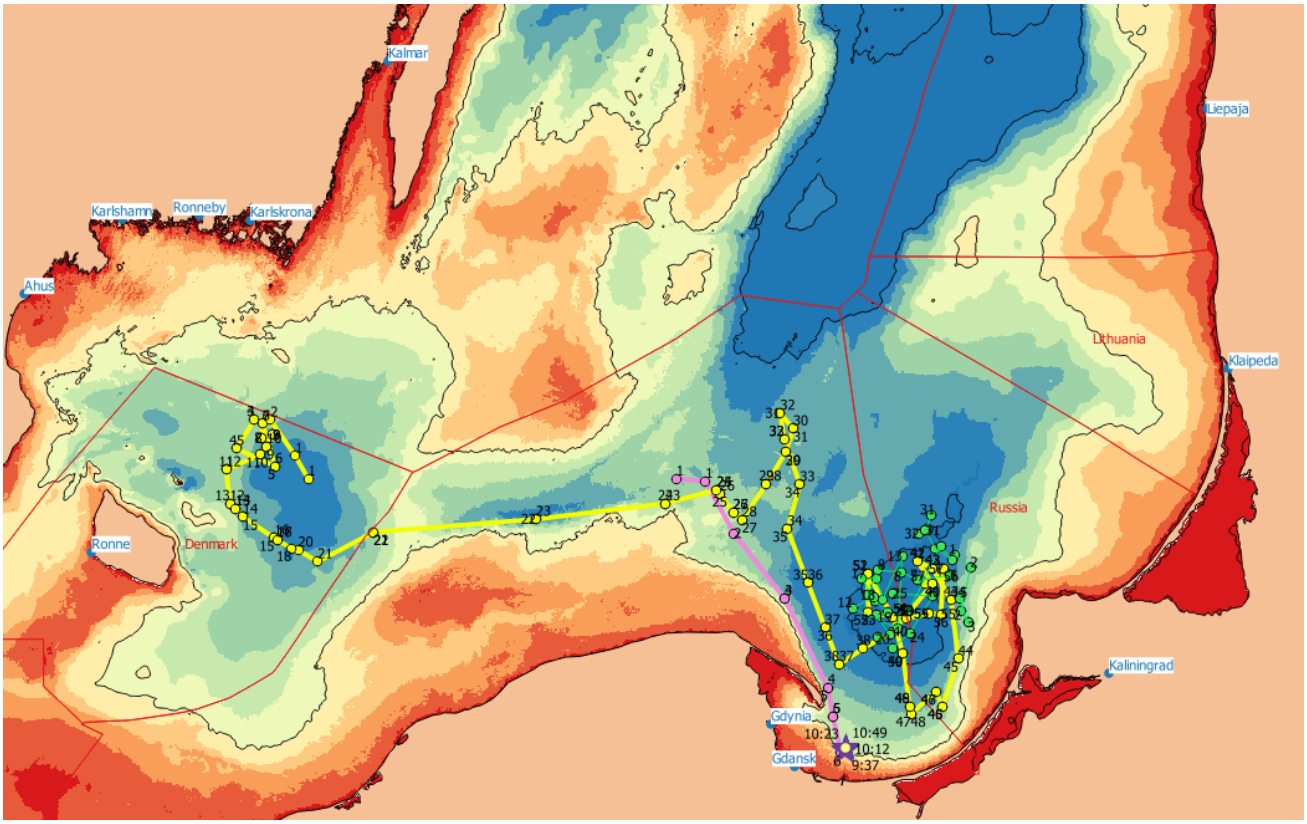


Figure 7: 2 floats deployed in the Baltic Sea. One float (pink) was recovered and redeployed 1 month later (green)

4.8. Nordic Seas

2 floats were deployed during the AREX2017 cruise of the Polish vessel OCEANIA.

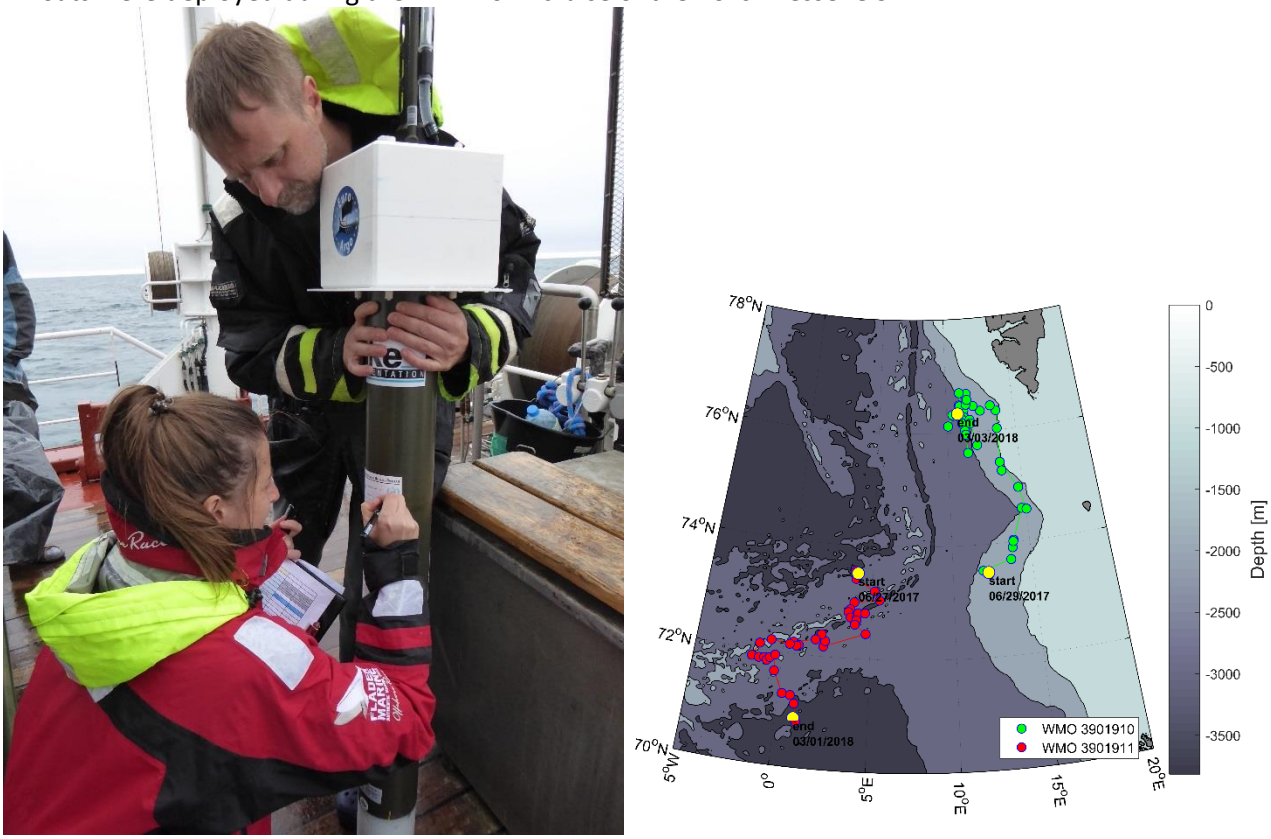


Figure 8: MOCCA AREX2017 floats deployment phase (left) and data profiles positions (right).

4.9. Mediterranean Sea

- One float was deployed in the Adriatic and one in the Aegean Sea.
- 2 other floats were launched during the PROTEUS cruise in the Southern Part of the Mediterranean.

Figure 9: MOCCA deployment in the Adriatic.

5. MAINTENANCE FLOATS

In 2017 2 MOCCA floats were recovered, one in the Baltic (see above) and one in the Nordic Seas. The later went back to the manufacturer to investigate for defect and will come back to the ERIC for deployment in 2018.

3 floats that did not pass acceptance tests in 2016 were delivered to the ERIC in 2017 after maintenance. They have been successfully tested in the pool in late 2017 and are therefore ready for deployment for 2018.

6. PLANS FOR 2018

6.1. Equatorial Atlantic Retroflection area

This cruise planned in 2017 was rescheduled in 2018 due to a ship maintenance. 6 floats will be deployed, 4 in the region and 2 during the transit.

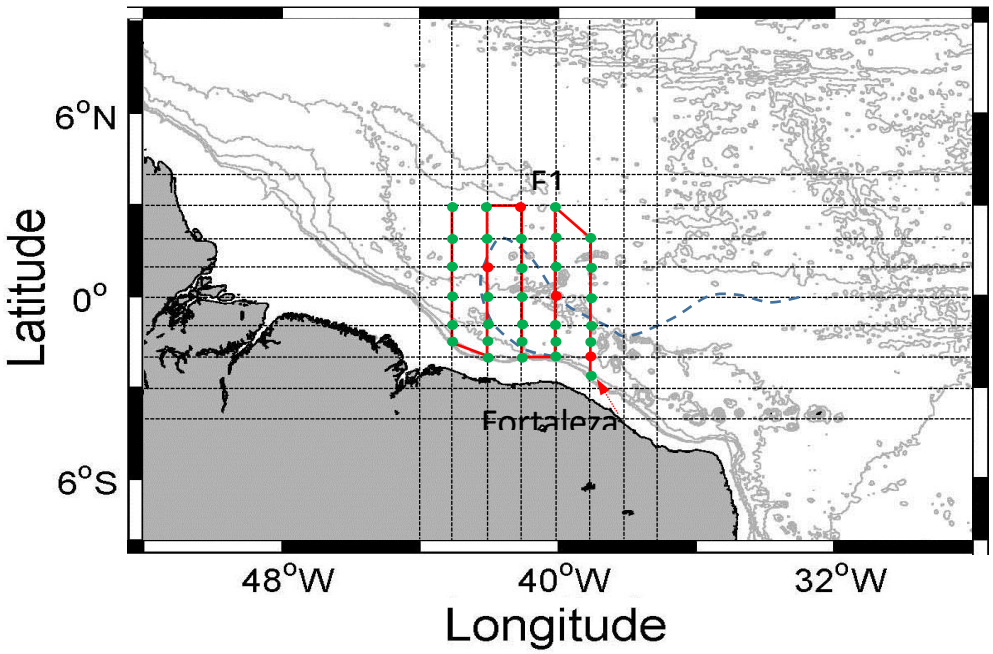


Figure 10: Map with tentative CTD stations (green dots); the red dots indicate those locations where the CTD will be accompanied by an Argo float launching.

6.2. Ships of opportunity

3 floats will be deployed by Orange Marine (see above) and 2 by the Plancius. A sailing cruise around Antarctica will deploy 3 floats.

6.3. Caribbean Sea

4 floats will be deployed in the Caribbean by a research team studying eddies.

6.4. Mediterranean Sea

1 float will be deployed close to the EMSO site.

6.5. Other

The remaining 10 floats at the ERIC are expected to be deployed in 2018. Current plans concerns a sailing race around the 3 Capes (Southern Oceans).

This is still under investigation; the aim is to maximize the scientific impact and the international network implementation with these remaining deployments.

Some recovered floats may be also redeployed.