

Argo Data Management Real-Time & Delayed-Mode Status

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*This report provides information on the status of Argo data availability.
ADMT is invited to provide feedback as appropriate.*

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IOC Resolution XX-6

(...) concerned coastal states must be informed in advance, through appropriate channels, of all deployments of profiling floats which might drift into waters under their jurisdiction, indicating the exact locations of such deployment. (...)

⇒ *All Argo floats should be registered at JCOMMOPS/AIC (and notified) in advance*

(...) the data and data products derived from those floats will be freely available in real-time and delayed mode through IOC and WMO exchange systems, as well as other appropriate international mechanisms (...)

⇒ *Real-time data distribution should start at 1st profile.*

Executive Summary

- ⇒ The real time data distribution could be optimized further as half of pending floats are older than a year. It is important to respect international regulations and meet modeler's requirements with real-time distribution of all Argo floats.
- ⇒ 90% of the array meets timeliness requirements but a few DACs could progress.
A few DACs are slow down at IFREMER GDAC (+3h). Could this be optimized as NRL-MRY adds only 0.5h to the process?
A few DACs cannot meet 24h target at NRL-MRY (while they do for IFREMER).
A few DACS had clear difficulties in August with 50% of profiles distributed within 24h.
There are still a few negative delays problems that need to be clarified and investigated further.
- ⇒ The ratio of data files processed in delayed mode, vs files eligible to this re-processing, keeps decreasing (68%). About half million profiles are waiting to be processed in delayed -mode.
2/3 of the challenge resides in regular Argo programmes.
- ⇒ DM processing status in the Southern Ocean is in better shape (78% and 83 % for the two areas studied)
- ⇒ BioGeoChemical Argo needs to improve all these stats as well
- ⇒ JCOMMOPS/AIC to improve monitoring stats on these issues on the new website

Performance Indicators

Data Flow			
Delivery Argo BioGeoChemical	88.96% 8/2016	95% Monthly Target	Nb of registered units vs number of operational units (BioGeoChemical Argo)
Delivery Argo Global	94.01% 8/2016	95% Monthly Target	Nb of registered units vs number of operational units (Global Argo)
Quality (DM Processing) Argo Global	68.53% 8/2016	75% Monthly Target	Nb of DM obs vs NB of DM eligible obs
Quality (PSAL) Argo Global	88.33% 8/2016	95% Monthly Target	Nb of monthly obs of best quality - PSAL
Quality (TEMP) Argo Global	92.91% 8/2016	95% Monthly Target	Nb of monthly obs of best quality - TEMP
Timeliness (GDAC FR) Argo Global	90.45% 8/2016	95% Monthly Target	% of monthly observations distributed within 24h (GDAC FR)
Timeliness (GDAC US) Argo Global	89.57% 8/2016	95% Monthly Target	% of monthly observations distributed within 24h (GDAC US)
Timeliness (GTS MF) Argo Global	94.36% 8/2016	95% Monthly Target	% of monthly observations distributed within 24h (GTS)
Whitelist Argo Global	96.54% 8/2016	95% Monthly Target	% of platforms whitelisted platforms vs operational platforms

Fig. 1: Performance Indicators for Argo Data Flow on argo.jcommops.org

Real-Time

A number of floats were registered at the JCOMMOPS/AIC (and notified) and no data are available at GDACs or on GTS. A float failure, a deployment cancelled, a deployment date postponed, a deployment under seasonal ice, or more often a delay in the data processing chain can explain this status. JCOMMOPS contacts regularly float operators to check the status of these pending floats (153 as of September 2016).

- ⇒ Make a query on argo.jcommops.org with Status='REGISTERED' and Deployment Date < today. Save this query to monitor these pending floats more easily.

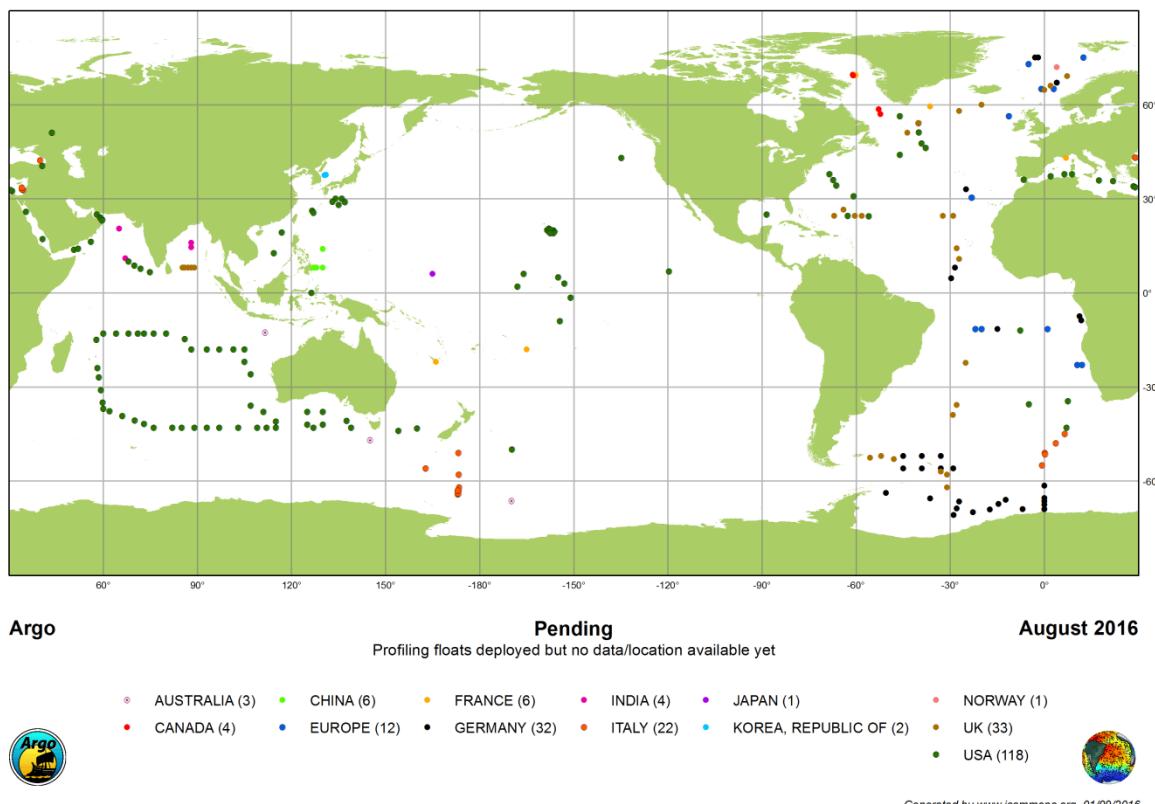
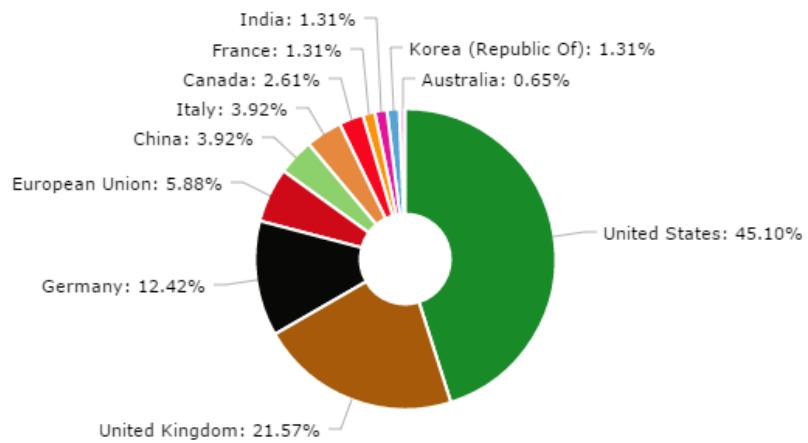


Fig. 2: Pending floats map, by country

Sample distribution



Sample distribution

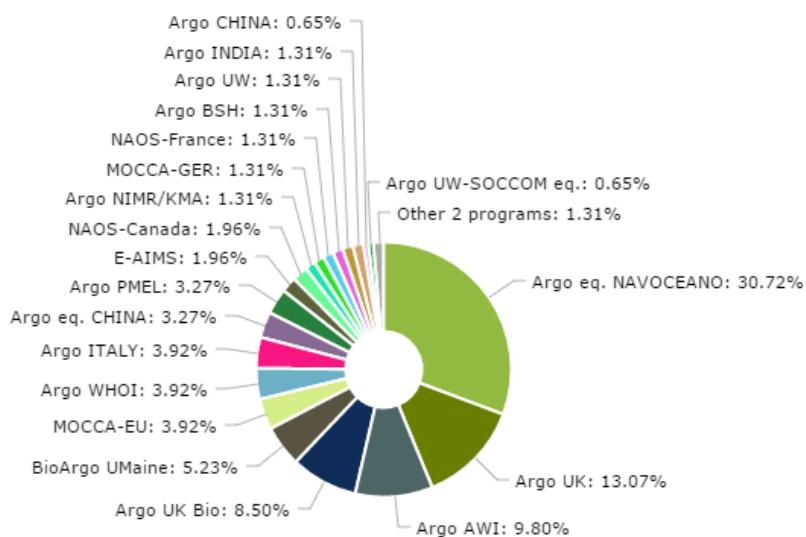


Fig. 3,4: Distribution of pending floats by Country and by Program

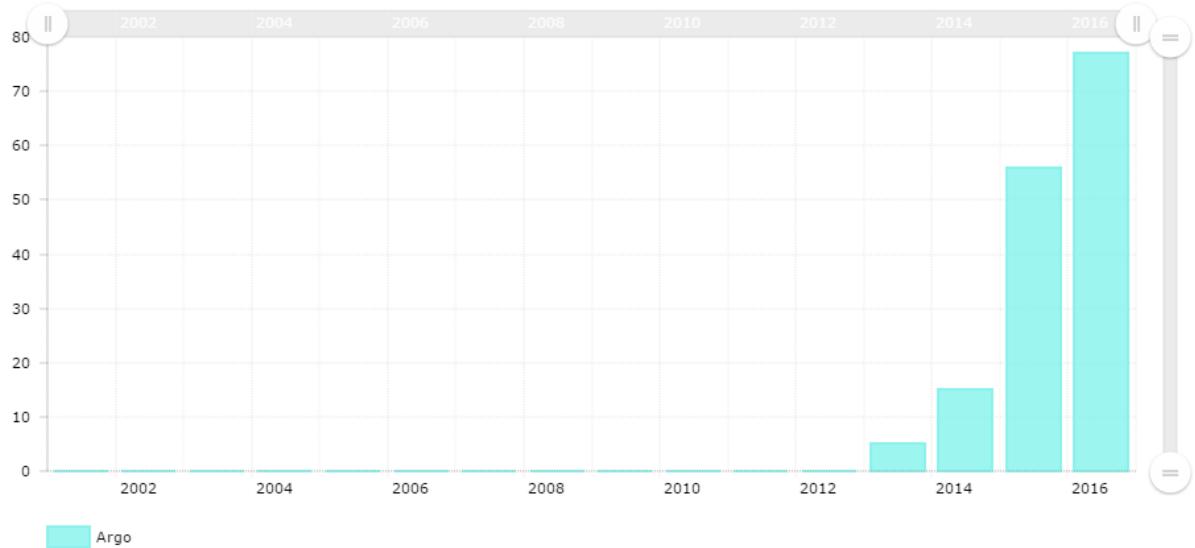


Fig. 5: Deployment date of pending floats

Sample distribution

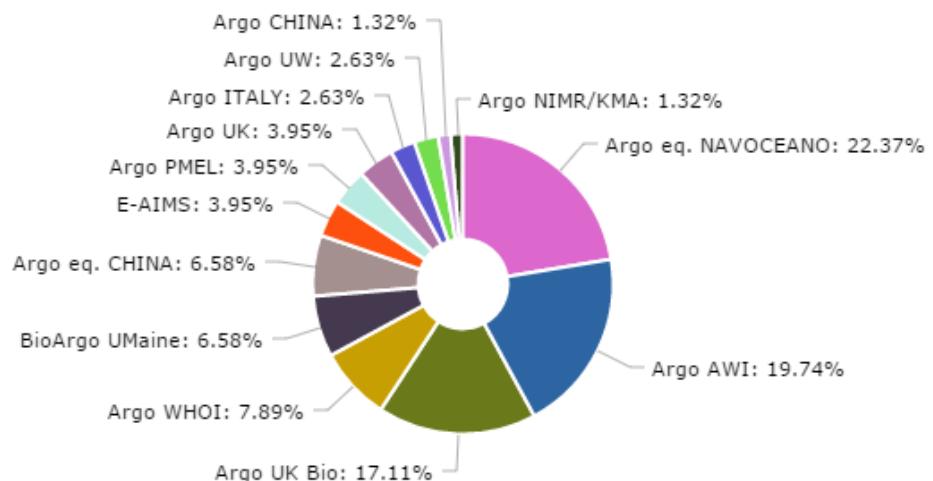


Fig. 6: Pending floats deployed before 2016, by Program

Delays

Source:

GDACs detailed index files

Definitions:

GDAC Distribution Date: 1st availability of file on GDAC ftp

Date Update: 1st date of assembly in netCDF file

Observation Date: Observation Date in netCDF file

$$\text{Delay} = (\text{GDAC Distribution Date} - \text{Observation Date}) = (\text{Delay_DAC} + \text{Delay_GDAC})$$

$$\text{Delay_DAC} = (\text{GDAC Distribution Date} - \text{Date Update})$$

$$\text{Delay_GDAC} = (\text{Date Update} - \text{Observation Date})$$

Delays have been calculated below on all observations available at GDACs in August 2016, on September 20th 2016.

The later you calculate delays the higher will be the values as it is likely some files were submitted long after observation date.

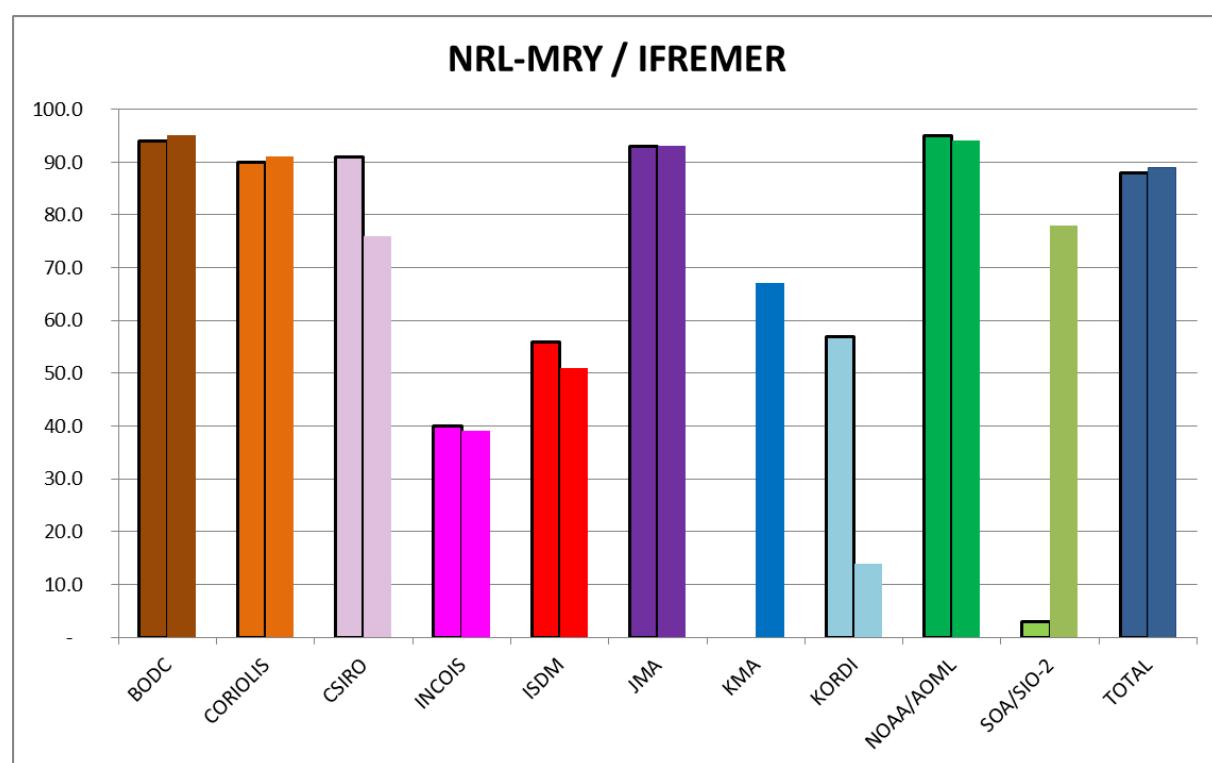
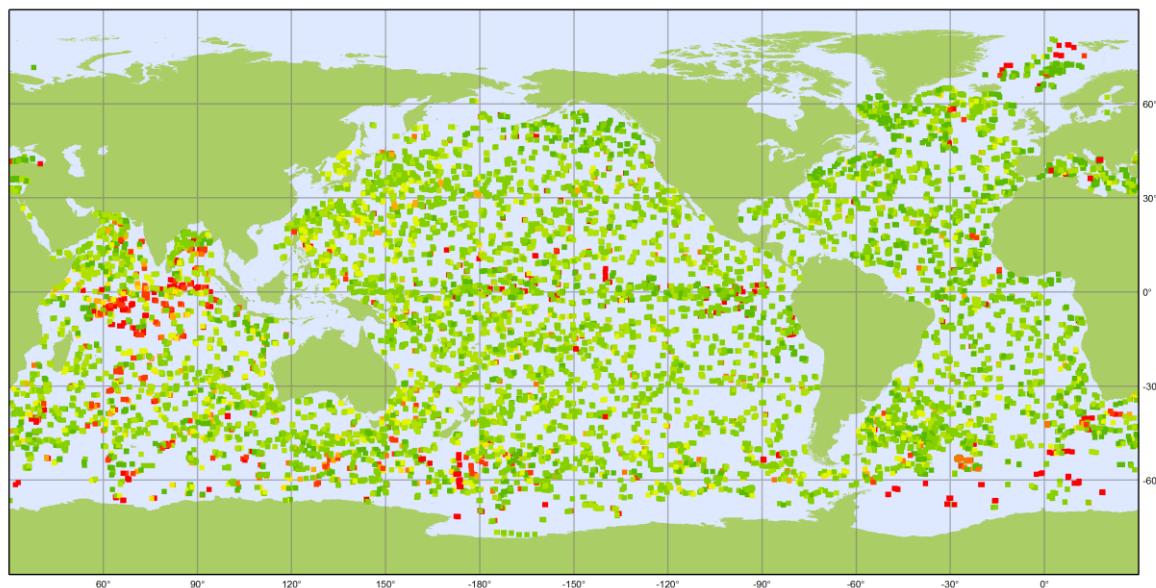
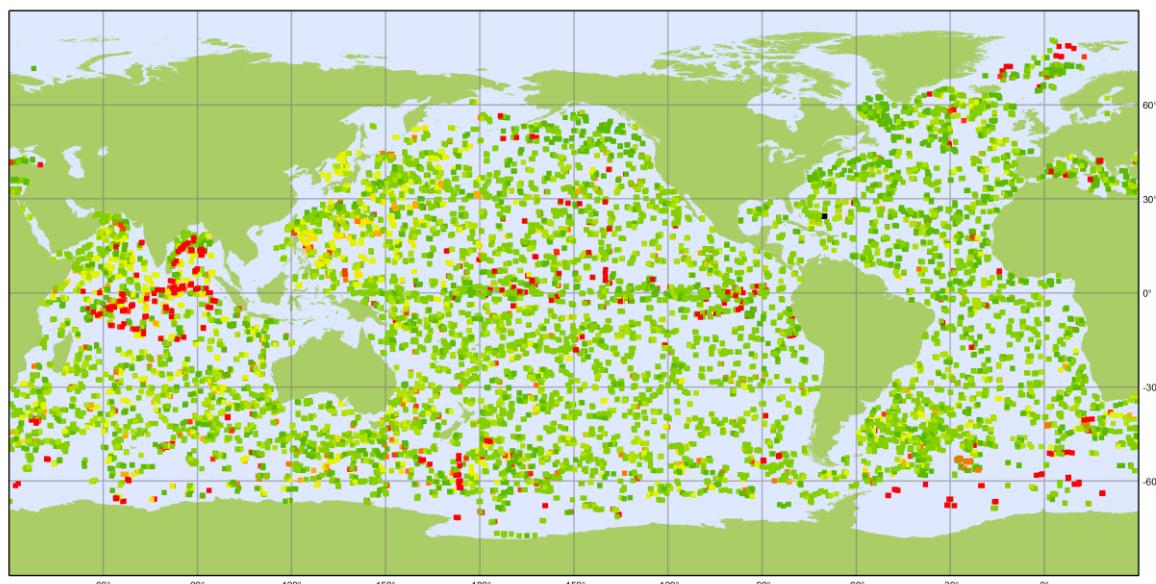


Fig. 7: % of observations distributed within 24h, by DAC, on the 2 GDACs



August 2016

Generated by www.jcommops.org, 01/09/2016



August 2016

Generated by www.jcommops.org, 01/09/2016

Fig. 8,9: Maps of total delays at GDACs for August 2016, as calculated on September 1st.

IFREMER							
DAC	AVG	MEDIAN	PERCENT	AVG_DAC	AVG_GDAC	MEDIAN_DAC	MEDIAN_GDAC
BODC	14.8	11.9	95.0	12.5	2.3	9.6	2.2
CORIOLIS	26.0	5.9	91.0	25.2	0.9	5.8	0.6
CSIRO	21.8	9.9	76.0	18.1	3.7	6.0	3.1
INCOIS	85.4	26.0	39.0	72.9	12.5	24.9	1.0
ISDM	102.5	12.7	51.0	70.2	32.2	2.4	9.3
JMA	16.6	11.1	93.0	13.5	3.2	8.0	3.2
KMA	27.6	23.6	67.0	24.4	3.2	20.4	3.2
KORDI	25.7	25.2	14.0	31.6	-	5.9	31.1
NOAA/AOML	18.5	9.5	94.0	16.4	2.1	6.8	3.0
SOA/SIO-2	27.6	18.2	78.0	21.6	6.0	12.7	5.4
TOTAL	23.8	9.3	89.0	20.7	3.1	6.8	3.0

Table1: Delays observed at IFREMER GDAC

NRL-MRY							
DAC	AVG	MEDIAN	PERCENT	AVG_DAC	AVG_GDAC	MEDIAN_DAC	MEDIAN_GDAC
BODC	12.4	9.2	94.0	13.3	-	1.0	10.2
CORIOLIS	26.0	6.4	90.0	25.1	0.9	5.8	0.9
CSIRO	19.1	7.1	91.0	18.8	0.2	6.5	0.7
INCOIS	84.9	25.2	40.0	72.6	12.4	24.8	0.6
ISDM	74.7	7.5	56.0	70.3	4.5	2.4	4.5
JMA	14.0	8.5	93.0	13.5	0.6	8.0	0.4
KMA	36.0	27.9	-	24.4	11.6	20.4	7.3
KORDI	23.6	23.0	57.0	31.6	-	8.0	31.1
NOAA/AOML	15.4	7.0	95.0	17.6	-	2.1	9.1
SOA/SIO-2	44.3	35.2	3.0	21.6	22.7	12.7	22.4
TOTAL	21.6	7.2	88.0	21.4	0.2	8.2	0.5

Table2: Delays observed at NRL-MRY GDAC

- ⇒ Pb of dates for KORDI,BODC, AOML files (bad ftp file tagging at GDAC , update of observation date ?). to investigate further.
- ⇒ Delays have been very high for INCOIS and ISDM in August
- ⇒ GDAC adds 3h to the process
- ⇒ Large delays added by NRL-MRY for INCOIS, ISDM, KMA, SOA

Note that argo.jcommops.org provides views on delays, either on individual floats or on any group of float or observation. Section is however currently under review.



Fig. 10: Timeline of total delays for float 4901180 for both GDACs

Delayed-Mode

The ratio of data files processed in delayed mode, vs files eligible to this re-processing, keeps decreasing (68%). About half million profiles are waiting to be processed in delayed –mode.

PROGRAM	#OBS	#OBS DM_ELIGIBLE	#DM	%	TO DM
Argo eq. NAVOCEANO	71105	61991	514	1	61477
Argo PMEL	151911	132393	82671	62	49722
Argo WHOI	147642	133197	92818	70	40379
Argo UW	243796	223096	183062	82	40034
Argo JAMSTEC	115144	110502	77866	70	32636
Argo INDIA	51484	46224	27810	60	18414
Argo UK	50367	45908	27538	60	18370
Argo CANADA	43455	41308	25214	61	16094
Argo KIOST	16217	15814		-	15814
Argo eq. JMA	27442	23838	8560	36	15278
Argo CHINA	25924	23044	10100	44	12944
Coriolis	40051	32133	19680	61	12453
Argo AUSTRALIA	112544	99467	87415	88	12052
Argo eq. CHINA	13048	9757	132	1	9625
Argo eq. JAMSTEC	13727	12688	3994	31	8694
Coriolis-Good Hope	17243	15557	7080	46	8477
Argo eq. AOML	7433	7433		-	7433
Argo UW-MBARI eq.	9138	7707	955	12	6752
Argo SPAIN	7127	6631	691	10	5940
Coriolis-remOcean eq.	8386	5717		-	5717
Argo BSH	26866	22529	18424	82	4105
Argo NIMR/KMA	23033	22575	18857	84	3718
Coriolis-CONGAS	5228	5191	1706	33	3485
Argo UW-SPURS eq.	3914	3456		-	3456
Argo AWI	5247	4764	1628	34	3136
Argo UW-APL eq.	3592	3053		-	3053
Argo ITALY	10300	6670	3821	57	2849
NAOS-France	4247	2981	176	6	2805
Coriolis-BIOArgo	4476	3735	984	26	2751
Coriolis-PIRATA	5015	4241	1821	43	2420
Argo CHINA SOA	2462	2391		-	2391
Coriolis-FRONTALIS	2128	2128		-	2128
Argo eq. TU	1748	1748	167	10	1581
Argo IRELAND	2636	2302	920	40	1382
Argo eq. SAGE	5729	5729	4394	77	1335
DEKOSIM	1485	1286	105	8	1181
Argo eq. OIST	1263	1150		-	1150
Argo eq. FSU	1146	1146		-	1146

Argo IFM-GEOMAR	8647	8277	7195	87	1082
Argo eq. HNFRI	977	977		-	977
Argo eq. TNFRI	918	918		-	918
Argo FINLAND	1710	1315	456	35	859
Argo MAURITIUS	1726	1587	734	46	853
Coriolis-CANOA	824	824		-	824
Argo NORWAY	2820	2297	1503	65	794
BulArgo	922	785		-	785
Argo eq. ESP-OMZ	2439	2439	1727	71	712
Argo SIO	195464	174029	173401	100	628
Argo ARGENTINA	2576	2486	1903	77	583
Argo BRAZIL	2310	2238	1665	74	573
Coriolis-SPICE	561	561		-	561
Argo GOM-BOEM eq.	582	556		-	556
Coriolis-OVIDE	7063	6155	5611	91	544
Argo JMA	492	492		-	492
MEDARGO	3050	3050	2559	84	491
Argo GREECE	1116	587	101	17	486
Argo NETHERLANDS	8196	7768	7283	94	485
E-AIMS	941	467		-	467
Coriolis-PROSAT	1732	1732	1289	74	443
Argo eq. NDBC	433	433		-	433
Argo AUSTRALIA eq.	11423	9933	9504	96	429
Argo UK Bio	396	348		-	348
Argo UW-UA eq.	336	336		-	336
Coriolis-EGYPT	1477	1477	1141	77	336
Argo eq. NRIFS	308	308		-	308
EuroArgo	814	610	341	56	269
Argo MEXICO	674	582	319	55	263
Argo eq. UHH	3331	3328	3096	93	232
Argo GERMANY	4540	4528	4296	95	232
Argo RUSSIA	472	472	281	60	191
Gyroscope	7182	7182	6999	97	183
Argo BRAZIL Navy	637	182		-	182
Argo eq. AWI	2144	2144	1973	92	171
Coriolis-DRAKE	2741	2741	2576	94	165
Coriolis-TRACK	2004	2003	1842	92	161
Argo GABON	210	210	90	43	120
Argo ECUADOR	876	814	694	85	120
MERSEA	4194	4194	4083	97	111
Argo CHILE	372	372	268	72	104
Argo NEW ZEALAND	3776	3349	3253	97	96
Argo SOUTH AFRICA	297	261	170	65	91
Argo COSTA RICA	82	82		-	82
Argo SAUDI ARABIA	68	68		-	68

Argo eq. VOCALS	1313	1313	1252	95	61
Argo KENYA	708	672	623	93	49
Argo SIO eq (ASIRI)	849	633	591	93	42
Coriolis-FLOPS	2200	2163	2121	98	42
Argo SRI LANKA	77	77	41	53	36
Argo eq. IFM	3263	3263	3227	99	36
Argo eq. TSK	35	35	4	11	31
Argo eq. UM-OSU	26	26		-	26
Argo WHOI-MRV eq.	22	15		-	15
Argo WHOI eq. IR	2926	2926	2918	100	8
Argo eq. IFM2	1397	1397	1390	99	7
Coriolis-EGEE	3101	3101	3095	100	6
Coriolis-FLOSTRAL	2362	2362	2357	100	5
Argo UK eq.	2467	2467	2463	100	4
Argo LEBANON	53	53	52	98	1
Argo eq. PMEL	2086	2086	2085	100	1
Argo eq. UH	11854	11854	11854	100	0
Argo eq. POMME	3511	3511	3511	100	0
Argo eq. BSH	3295	3295	3295	100	0
Argo eq. ORI	728	728	728	100	0
Argo POLAND	419	206	206	100	0
Argo DENMARK	360	360	360	100	0
Argo eq. IRELAND	178	178	178	100	0
Meridian Goodhope	119	119	119	100	0
Argo eq. NIPR	28	28	28	100	0
Argo SIO eq. (OKMC)	5402	4914	5161	105	0
Argo UW-SOCCOM eq.	1633	543	759	140	0
Coriolis-FNOB-JCOMMOPS	489	201	2128	1 059	0
TOTAL	1628453	1465503	1006002	68.6	461891

Table 3: DM processing status by Program, ordered by files remaining to be processed.

⇒ We can note first that 2/3 of the challenge has to do with regular Argo programmes, and 1/3 with equivalent contributions that we often call ‘orphan floats’.

PROGRAM	#OBS	#OBS DM_ELIGIBLE	#DM	%
Argo eq. NAVOCEANO	71105	61991	514	1
Argo KIOST	16217	15814		-
Argo eq. CHINA	13048	9757	132	1
Argo UW-MBARI eq.	9138	7707	955	12
Coriolis-remOcean eq.	8386	5717		-
Argo eq. AOML	7433	7433		-
Argo SPAIN	7127	6631	691	10
NAOS-France	4247	2981	176	6

Argo UW-SPURS eq.	3914	3456		-
Argo UW-APL eq.	3592	3053		-
Argo CHINA SOA	2462	2391		-
Coriolis-FRONTALIS	2128	2128		-
Argo eq. TU	1748	1748	167	10
DEKOSIM	1485	1286	105	8
Argo eq. OIST	1263	1150		-
Argo eq. FSU	1146	1146		-
Argo GREECE	1116	587	101	17
Argo eq. HNFRI	977	977		-
E-AIMS	941	467		-
BulArgo	922	785		-
Argo eq. TNFRI	918	918		-
Coriolis-CANOA	824	824		-
Argo BRAZIL Navy	637	182		-
Argo GOM-BOEM eq.	582	556		-
Coriolis-SPICE	561	561		-
Argo JMA	492	492		-
Argo eq. NDBC	433	433		-
Argo UK Bio	396	348		-
Argo UW-UA eq.	336	336		-
Argo eq. NRIFS	308	308		-
Argo COSTA RICA	82	82		-
Argo SAUDI ARABIA	68	68		-
Argo eq. TSK	35	35	4	11
Argo eq. UM-OSU	26	26		-
Argo WHOI-MRV eq.	22	15		-

Table 4: DM processing status by Program, ordered by files remaining to be processed (ratio < 25%)

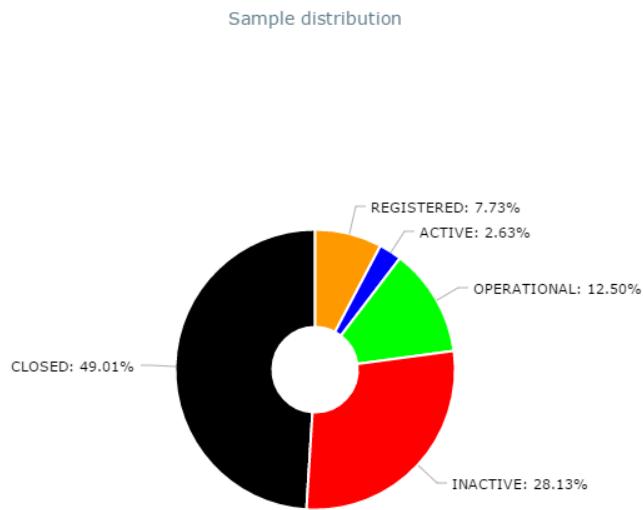
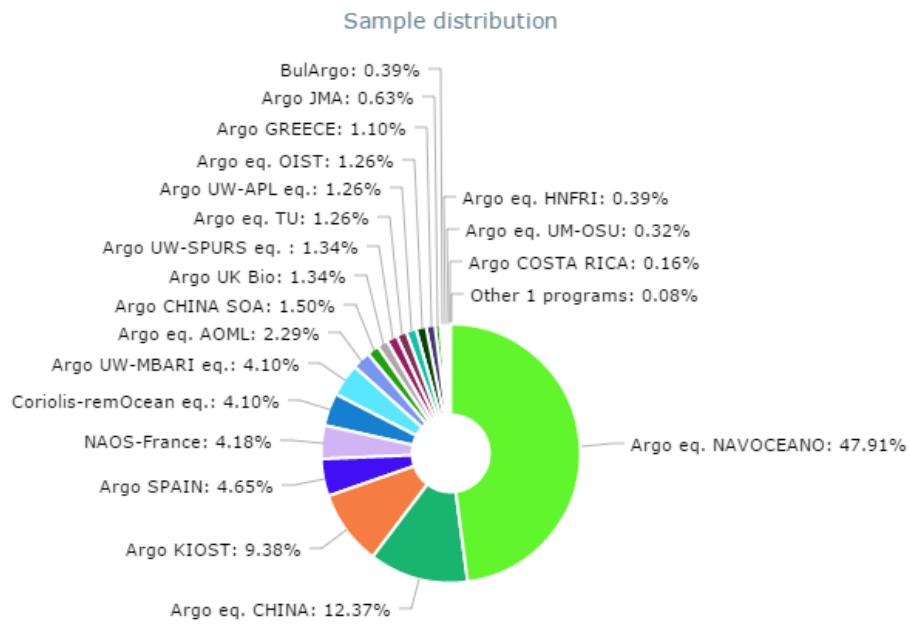


Fig 11, 12: Distribution of floats and Programmes with DM ratio < 25% and status of these floats

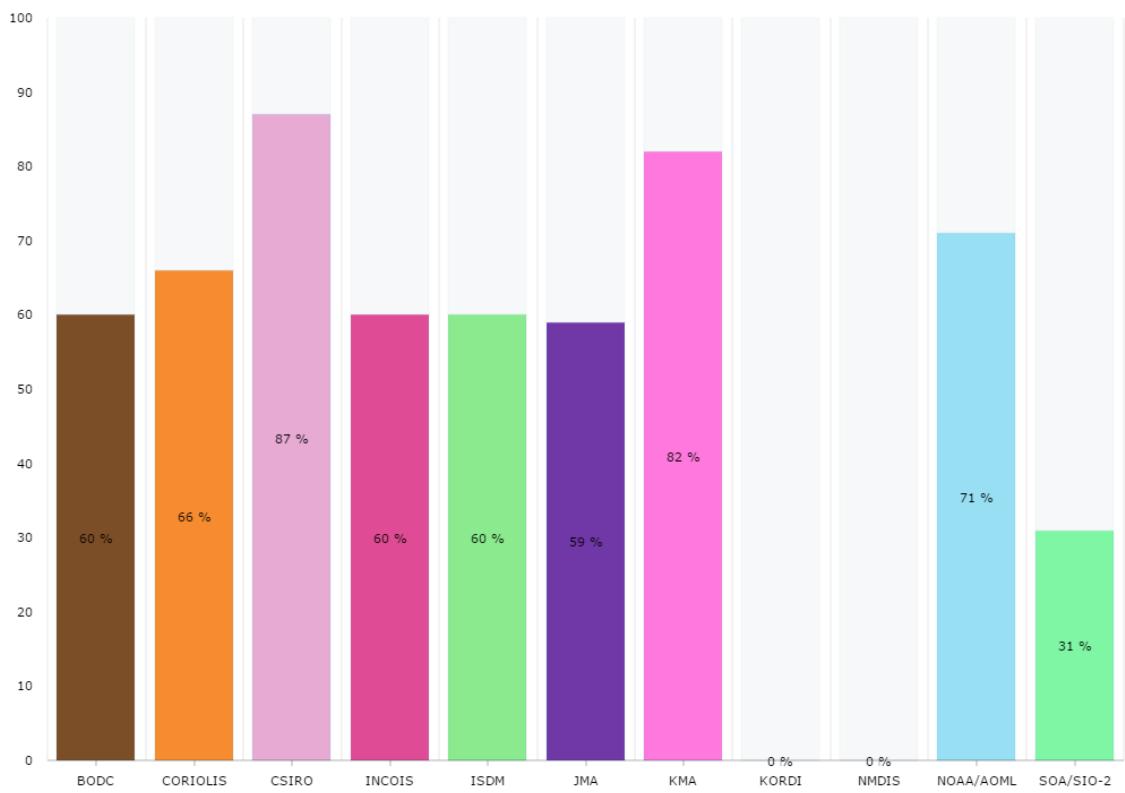


Fig 12: DM ratio by DAC

- ⇒ For the orphan floats, we may need to support US NAVY, KIOST, and CHINA (NMDIS).
- ⇒ Note that most of these floats are not active anymore so the work load will be for once.

Here are below additional information on these floats, to ease volunteers.

NMDIS :

20 Floats (Bay of Bengal, NW Pacific)

2535 obs,

2428 DM_Eligible

100% PROVORs

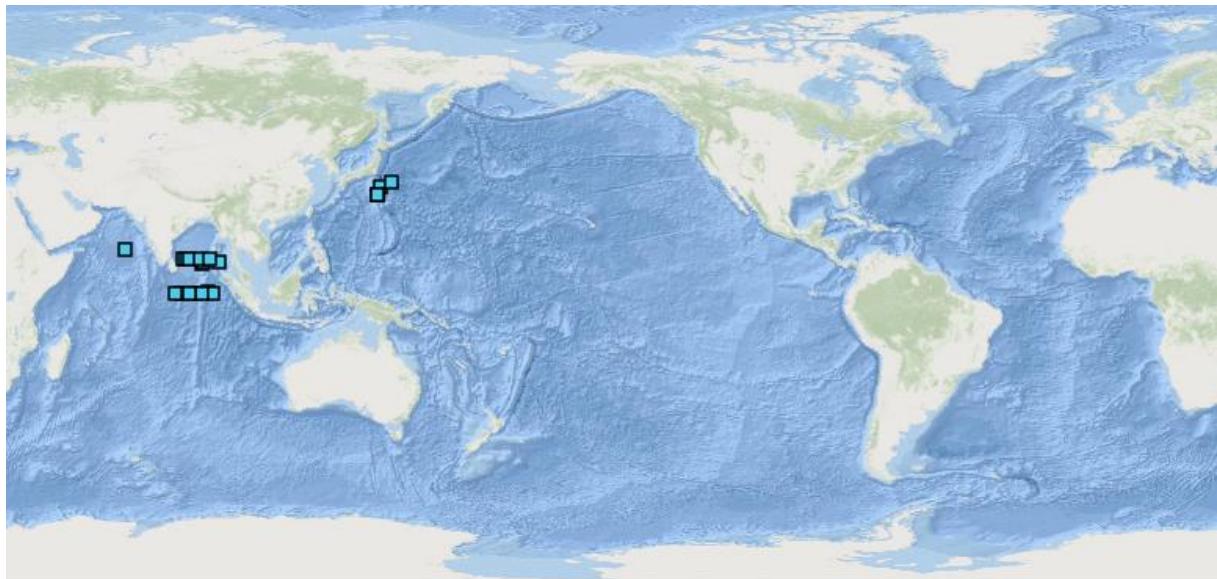


Fig 13: launch locations of NMDIS floats

KIOST (Sea of Japan, South Tasmania, Drake Passage)

117 floats

15736 obs

15370 dm eligible

22% PROVOR_MT, 78% APEX

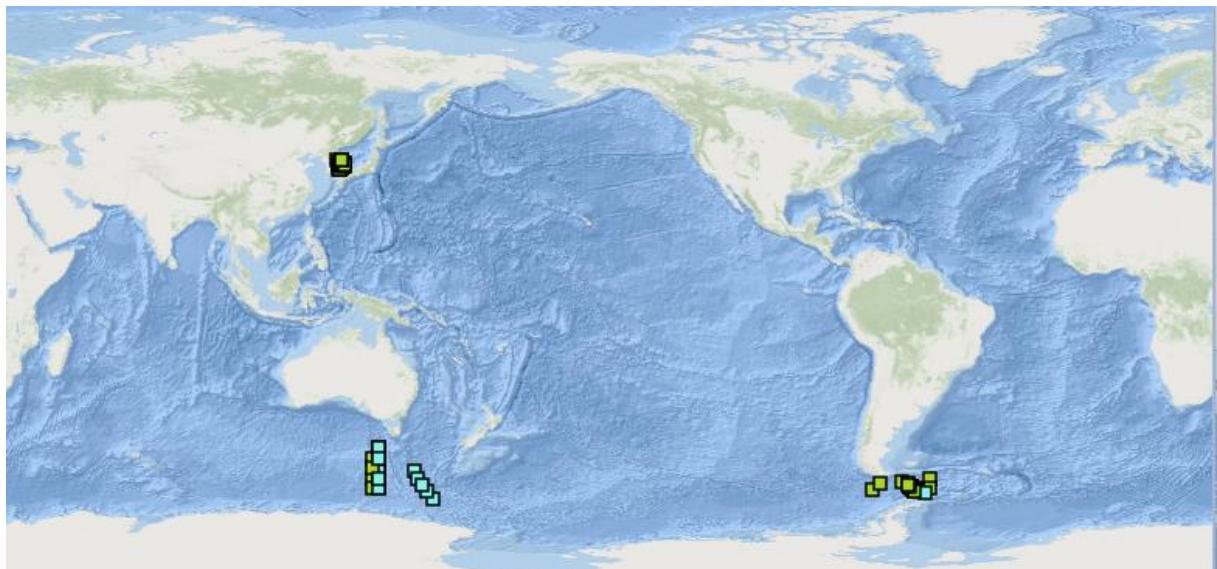


Fig 14: launch locations of KIOST floats

NAVO :

608 floats
71098 obs
514 dm
61990 dm_eligible
mainly APEX

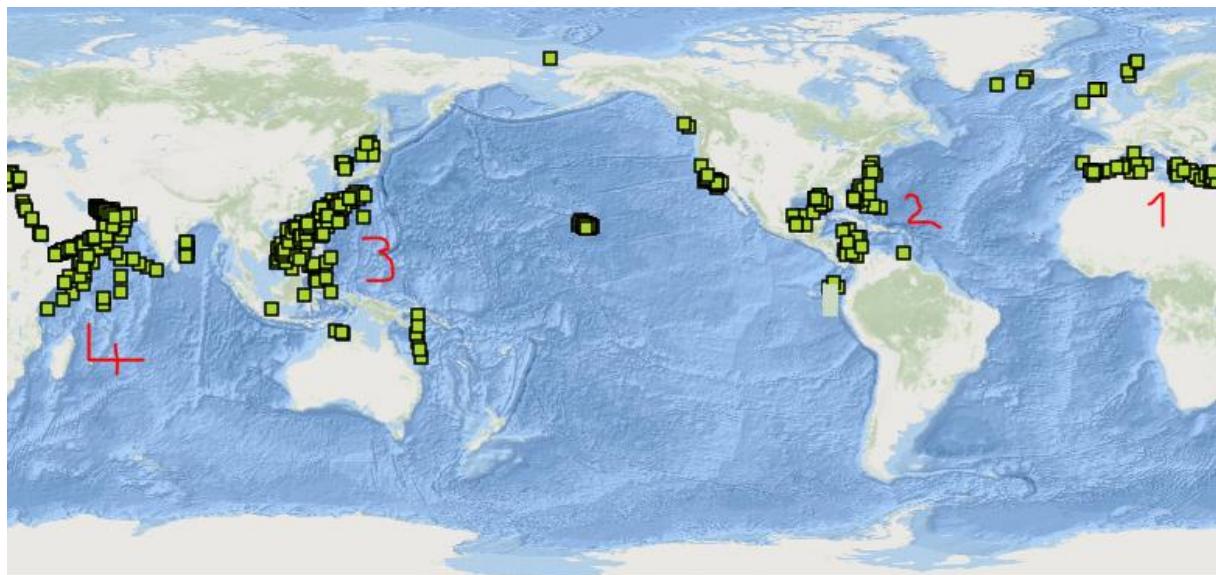


Fig 15: launch locations of NAVO floats

Region 1: Med Sea:

58 floats
6115 obs
316 dm
53914 dm_eligible

Region 2: Gulf of Mexico, Atlantic Ocean

59 floats
8530 obs
7115 dm_eligible

Region 3 :

203 floats
19714 obs
18945 dm_eligible

Region 4:

199 floats
23103 obs
198 dm

20323 dm_eligible

- ⇒ Improve stats for monitoring on jcommops.org
- ⇒ Create workspace for DM operator
- ⇒ What functionalities would be useful? A permanent to do list by DM Operator? Other tools ?

DM Processing in the Southern Ocean

A special study was made under Argo Australia request, to monitor the status of DM processing in two zones of the southern ocean, [-90;-60] and [-60;-30].

We basically need some support for KIOST floats (that recalled regularly having no expertise on DMQC in SO).

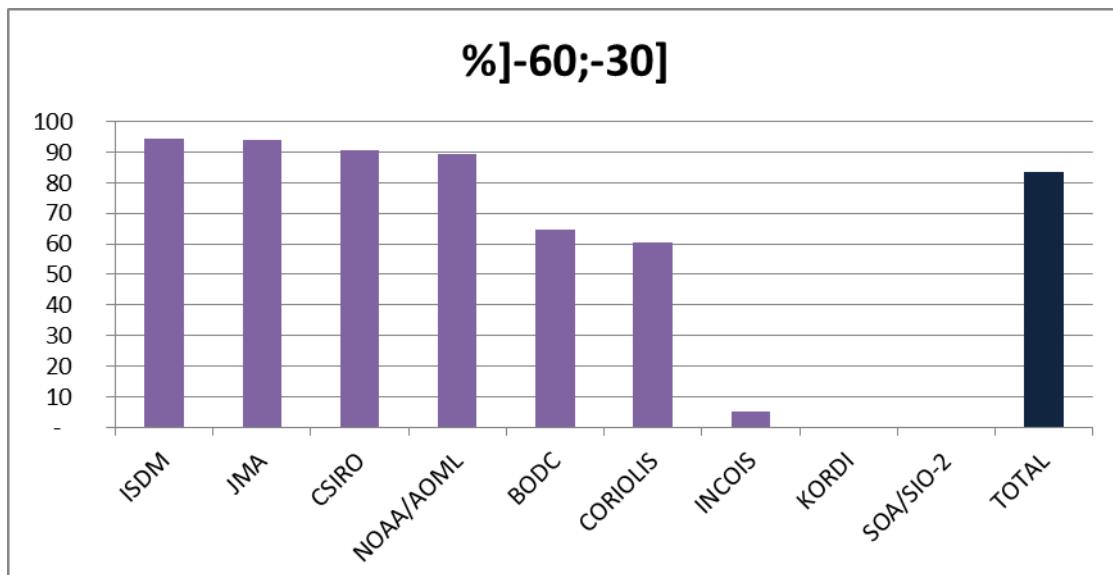
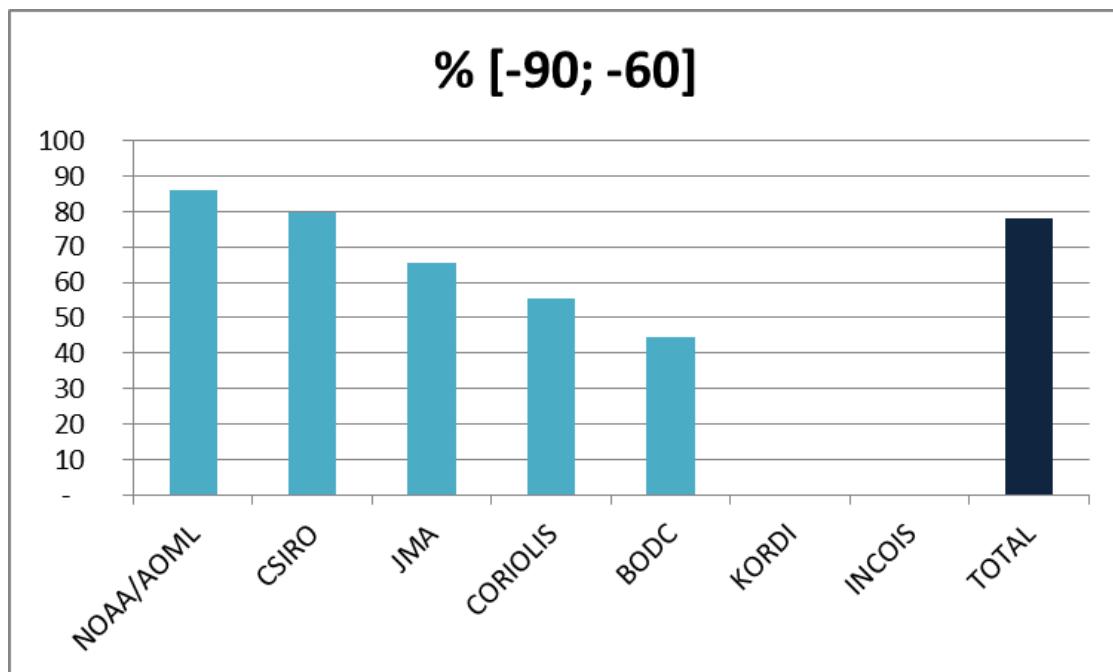


Fig 16, 17: DM processing Status in Southern Ocean, by DAC

DM Operators List

The following table provides the latest update on DM Operators.
This list is certainly not error free nor nominates anyone for additional task.
Please feedback.

PROGRAM	DM OPERATOR
Argo ARGENTINA	probbins@whoi.edu
Argo AUSTRALIA	esmee.vanwijk@csiro.au
Argo AUSTRALIA eq.	esmee.vanwijk@csiro.au
Argo AWI	gerd.rohardt@awi.de
Argo BRAZIL	probbins@whoi.edu
Argo BRAZIL Navy	
Argo BSH	birgit.klein@bsh.de
Argo CANADA	ouelletm@dfo-mpo.gc.ca
Argo CHILE	ouelletm@dfo-mpo.gc.ca
Argo CHINA	liuzenghong@139.com
Argo CHINA SOA	
Argo COSTA RICA	christine.coatanoan@ifremer.fr
Argo DENMARK	birgit.klein@bsh.de
Argo ECUADOR	awong@ocean.washington.edu
Argo eq. AOML	
Argo eq. AWI	birgit.klein@bsh.de
Argo eq. BSH	birgit.klein@bsh.de
Argo eq. CHINA	christine.coatanoan@ifremer.fr
Argo eq. ESP-OMZ	oulloa@profco.udec.cl
Argo eq. FERHRI	
Argo eq. FSU	
Argo eq. HNFRI	argo-dp@jamstec.go.jp
Argo eq. IFM	birgit.klein@bsh.de
Argo eq. IFM2	birgit.klein@bsh.de
Argo eq. IRELAND	juck@bodc.ac.uk
Argo eq. JAMSTEC	argo-dp@jamstec.go.jp
Argo eq. JMA	argo-dp@jamstec.go.jp
Argo eq. NAVOCEANO	ppoulain@inogs.it
Argo eq. NDBC	
Argo eq. NIPR	argo-dp@jamstec.go.jp

Argo eq. NRIFS	argo-dp@jamstec.go.jp
Argo eq. OIST	argo-dp@jamstec.go.jp
Argo eq. ORI	argo-dp@jamstec.go.jp
Argo eq. PMEL	gregory.c.johnson@noaa.gov
Argo eq. PMEL	kristene.e.mctaggart@noaa.gov
Argo eq. POMME	vthierry@ifremer.fr
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Remark:

Some DM operator download data files and may do the processing a while after.

If the real-time file have changed or were deleted ... they will come back through the dm processing.

A checkpoint needs to be set up, comparing RT and DM file number e.g.