

Argo National Data Management Report for ADMT-25, JAPAN

1. Real Time Status

Please report the status of your real time data processing for all Argo Missions, including pilots. If you have not yet implemented the tasks, please give us an estimate of when you expect the task to be completed. Here are some questions to answer:

- How many floats are you currently processing & what type are they?

Float family	Number of version (DAC_FORMAT_ID)	Number of floats* (*approximate)
APEX	9	99
ARVOR	1	52
PROVOR	1	2
Navis	1	5
BGC Navis	1	2
Deep APEX	2	6
Deep NINJA	1	1

- How many different sensors are you currently processing?

Parameters	Type(s) of sensor for that parameter
Pressure	KISTELER, DRUCK, RBR_PRES, RBR_PRES_A
Temperature/Salinity	SBE41CP_V7.2.5, SBE41N_V5.3.5, SBE61, RBR, RBR_ARGO3
Oxygen	AROD_FT, SBE63_OPTODE
NO3	SUNA_V2
Chla	MCOMS_FLBBCD
bbp	MCOMS_FLBBCD
CDOM	MCOMS_FLBBCD

We processed following BGC sensors, but those floats have already been inactive.

Parameters	Type(s) of sensor for that parameter
Oxygen	ARO-FT, AANDERAA_OPTODE_3830, AANDERAA_OPTODE_4330, AANDERAA_OPTODE_4831, SBE43F_IDO, SBE43I
pH	SEAFET
Chla	ECO_FLBB_AP2, ECO_FLBBCD_AP2
bbp	ECO_FLBB_AP2, ECO_FLBBCD_AP2
CDOM	ECO_FLBBCD_AP2

New Sensors you have begun processing (either deployed in past 12 months or expected in the next few months)	Have all the Argo vocabularies been implemented to accommodate the sensor? (Yes, No, In progress)
OCR504	The floats have not yet been delivered and cannot be checked.

- What is the status of BGC processing and RTQC test implementation? See here to get the version of manuals you are using to process and qc the BGC variables or : [Documentation - Argo Data Management \(argodatamgt.org\)](http://argodatamgt.org) If your floats **do not** include a listed parameter, please enter 'N/A' (Not Applicable); if your floats **do** include the listed parameter, but you have not yet implemented processing for this parameter, please enter 'N/I' (Not Implemented).

parameter	Processing cookbook version you are using (ie, current or version 2.0 Oct 2018)	QC manual version you are using (ie, current or version 2.0 Oct 2018)	Notes on when changes will be made to update to latest version
oxygen	Current	Current	
NO3	Current	Current	
pH	N/A	N/A	
Chla	Current	N/I	By ADMT-26
bbp	Current	Version 0.9	By ADMT-26
CDOM	Current	N/A	
irradiance	N/A	N/A	

- What is the status of RBR data processing (if applicable)? Are you adjusting salinity in real time? See [DACs with floats with RBR CTDs to implement real-time salinity adjustment as per QC Manual, and flag PSAL_ADJUSTED_QC = '1' in 'A' mode. Real time adjusted data can be distributed onto GTS · Issue #55 · OneArgo/ADMT \(github.com\)](#)

RBRargo3 2K model	Are you filling Adjusted data (A mode) following User Manual 3.8 instructions?	Notes or additional information
pre-April 2021	Yes	JAMSTEC implement real-time salinity adjustment based on QC Manual ver 3.8 every cycle and provide them JMA in real time.
post-April 2021	Yes	

- Are you regularly applying real time adjustments for the following items:
 - Salinity adjustments
 - Cpcor for deep floats
 - BGC parameters (if so, which ones)

	Yes/No for current R files	Are you going back to make adjustments on all available R files when new adjustment comes in?	Notes or additional information
Salinity adjustment	Yes	No	
Cpcor adjustment for Deep floats	Yes	No	
oxygen	Yes	No	
NO3	Yes	No	
pH	No	No	
Chla	No	No	
bbp	No	No	
irradiance	N/A	N/A	

- What data are you sending onto the GTS?
Pressure, Temperature, and Salinity.
- What data is going to the aux directory? UVP, FL2BB, etc
UVP.
- Are you automatically greylisting questionable floats detected by min/max test?
No, we are processing manually.
- What is the status of the transition to v3.2 trajectory files? When do you think you will be ready to stop acceptance of v3.1 Btraj files?
Not implemented. We have not made any v3.1 Btraj files.
- Do you have any code to share with other DACs? If so, where is that available?
No.

2. Delayed Mode QC status

This section of the report is for reporting on the status of DMQC in your country and is the place to share your progress, your challenges, your concerns and any links to shareable tools or code. The following questions to help guide you:

- What is the status of delayed mode trajectory files? Have you created any dmode trajectory files? If not, what are the reasons? If you have, would you be interested in sharing your experiences with others?

JAMSTEC have not created any dmode trajectory files. Before making dmode trajectory files, it is necessary to correct the float internal clock, the position information and the parameter values (P, T, and S, etc.) measured during the float parking phase at the parking depth and at the sea surface. We are now preparing a tool to correct the time of the float clock. Using our database that stores all data and corrected parameter values of Japanese floats, we can extract the information to dmode trajectory files. As soon as it is completed, we will start to make dmode trajectory files of the Iridium telecommunication floats which are not necessary to correct their position.

- How are you implementing BGC dmode - by parameter or one expert does all parameters?

JAMSTEC are implementing BGC DMQC of DOXY, Nitrate, pH, Chla, BBP700 and CDOM measured by the Japanese BGC floats. Of these six parameters, one person is responsible for the correction of DOXY, Nitrate and pH, and the other person is working for that of Chla. The person in charge of DMQC of BBP700 and CDOM will be assigned when the dmqc and correction methods of BBP700 and CDOM are finalized.

- What challenges have you encountered and how have you dealt with them?

The problem on synthetic profiles of the Japanese floats

The Ifremer GDAC pointed out that there are many profiles of the Japanese floats which PRES of Core file does not match one of B files, therefore, GDAC can not create Synthetic files using them. We found the reason why GDAC pointed out, the problem occurred in two cases: one is that PRES of Core-R file did not match one of BD file, the other that PRES of Core-D file did not match one of BR file. That is, this problem occurred when the data mode was different for Core and BGC.

In Japan, JMA is the Japanese DAC and decodes the data of Japanese floats to create Core-R and BR files of Japanese floats. JAMSTEC is in charge of DMQC of Core and BGC parameters for Japanese floats. JAMSTEC decodes data of all Japanese BGC floats and corrects them using the data decoded by JAMSTEC. Sometimes, the float data files are not received in time for real-time processing or the float data are updated later due to the problems such as poor telecommunication. In that case, JAMSTEC decodes the updated data files so that BR-files produced by JMA do not match the results JAMSTEC decoding. In addition to this, because JMA was not aware of the apf11 firmware error which writes data files overlapping observation layers, another reason why the results of decoding data by JMA and JAMSTEC were different. To avoid occurring the problem, JMA and JAMSTEC decide to submit Core-D and BD files simultaneously after both DMQC for Core and DMQC for one of BGC parameters are completed. Following the decision, JAMSTEC just started submitting BD files of Japanese floats with the corrected values for DOXY, Nitrate and pH to the GDAC.

Fixing the SAGE tool

We correct Nitrate and pH using SAGE, which are released by MBARI. We found that garbled characters appeared in SAGE installed on a Windows PC purchased in Japan when reading ODV files, which contain only alphanumeric characters, and neither ODV files could be read nor results output. We debugged the problem ourselves and solved it. Similar problems may occur in other languages.

Evaluating again the temporal drift of ARO-FTs

We evaluated again the temporal drift of ARO-FTs with ten APEX floats after the float deployment, which were deployed in 2021 and 2022. The ARO-FT is the optical dissolved oxygen sensor developed by JFE Advantech Co., Ltd., in collaboration with JAMSTEC. They have higher accuracy and resolution and faster response time than Optode4330. The temporal drift of ARO-FTs after the float deployment were estimated using oxygen measured in air approximately 20 times each time the floats reaches the sea surface each cycle. The oxygen partial pressure measured by ARO-FT in air often showed the unusual values, such as those close to 0 or above 1,000 mbar, when the float reaches the sea surface in the local daytime. The temporal drift of the float deployment estimated without these unusual values of the oxygen partial pressure is estimated to be $-0.31 \pm 0.17\%$ year⁻¹ by applying Bittig et al. (2018). This is slightly larger than that of Optode4330 mounted on the Argo floats. However, we succeeded that the temporal drift of dissolved oxygen

measured by ARO-FT after the float deployment could be corrected well. We confirmed the seasonal change of ocean saturation concentration calculated using the corrected dissolved oxygen of ARO-FT at 5 dbar and its amplitude was consistent with those shown in the monthly climatology of WOA2023 . We also checked that the corrected dissolved oxygen profile of ARO-FT observed at 210 days after the float deployment was within the initial accuracy of the specification using the dissolved oxygen data of the ship-based bottle sampling data which were sampled within 5km of the float position on the same day.

- Do you have any code or tools you'd like to share with other DM operators? If so, where is that available?

No.

- Do you have any concerns you'd like to bring to the ADMT?

No.

3. Value Added items

- List of current national Argo web pages, especially data specific ones

Japan Argo

<https://www.jamstec.go.jp/J-ARGO/?lang=en>

This site is the portal of Japan Argo program. The outline of Japanese approach on the Argo program, the list of the publication, and the link to the database site and PIs, etc. are being offered.

Real-time Database (JMA)

<https://www.data.jma.go.jp/argo/data/index.html>

This site shows global float coverage, global profiles based on GTS BUFR messages, and status of the Japanese floats.

- Known National Argo data usage
 - Please list known operational centers using Argo data in your country in this table:

Operational center	Contact (name, email), if known	What data do they use? (for example, core, BGC, all profile data, trajectory data)
Japan Meteorological Agency	argoadmin@climar.kishou.go.jp	Core profile data

- Products generated from Argo data that can be shared

Products of JMA

The following parameter outputs of MOVE/MRI.COM-JPN was released in December 2021 and can be found on

<https://www.data.jma.go.jp/goos/data/database.html>.

- Daily, 10day-mean and Monthly mean subsurface temperatures at the depths of 50m, 100m, 200m and 400m analyzed for approximately 0.1 x 0.1 degree grid points.
- Daily and 10day-mean Surface Currents for approximately 0.1 x 0.1 degree grid points.

MOAA GPV (Grid Point Value of the Monthly Objective Analysis using the Argo data)

MOAA GPV is the global GPV data set which is made by monthly OI objective analysis using Argo and TRITON mooring data. The dataset consists of two products using different float data modes, Near Real Time (NRT) mode and Delayed Mode (DM). The former mainly use real time QC Argo profile. The latter uses delayed mode QC Argo profile. The dataset of DM is updated once a year for last 10 years, using all Argo profile data in GDAC at that time.

These data set are released on the following website:

https://www.jamstec.go.jp/argo_research/dataset/moaagpv/moaa_en.html

MOAA GPV version 2 will be released in November 2024. The updates since version 1 are 3-dimentional (horizontal and temporal) OI objective analysis and the increase layers from 25 to 66 layers. The data set has monthly and every 10 days.

G-YoMaHa (Objectively mapped velocity data at 1000 dbar derived from trajectories of Argo floats)

JAMSTEC maps the drift data from Argo floats, YoMaHa'07, at the depth of 1000 dbar on a 1 degree grid, using optimal interpolation analysis. The mapped velocity field satisfies the geostrophic balance and the horizontal boundary condition of no flow through the boundary. The dataset is released on the following website:

https://www.jamstec.go.jp/argo_research/dataset/gyomaha/gyomaha_en.html
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MILA GPV (Mixed Layer data set of Argo, Grid Point Value)

JAMSTEC provides a data set of gridded mixed layer depth with its related parameters, named MILA GPV. This consists of 10-day and monthly average data and monthly climatology data in the global ocean using Argo temperature and salinity profiles. According to abrupt salty drift of CTD sensors on Argo floats that occur more frequently than usual because of a manufacturing problem, JAMSTEC had recalculated using the Argo profile data on the latest quality control status at September 17th 2021. Furthermore, JAMSTEC has released the new dataset mainly delayed mode Argo profile data (hereinafter referred to as Delayed Mode (DM)), in addition to the MILA GPV mainly using real time QC Argo profile (this version is hereinafter referred to as Near Real Time (NRT)). DM is updated once a year and JAMSTEC will recalculate the dataset for the entire period, using all Argo profile data in GDAC. Therefore, DM uses more delayed mode Argo profile data than NRT.

These data set are released on the following website:

https://www.jamstec.go.jp/argo_research/dataset/milagpv/mila_en.html

AQC Argo Data version 1.2

JAMSTEC provides the Argo temperature and salinity profiles as an extra corrected dataset, conducting more advanced automatic checks than real-time quality controls every month. This data set delivers in the ascii formation as well as the netcdf format, because it is useful for analyses using various software. This dataset are released on the following website:

https://www.jamstec.go.jp/argo_research/dataset/aqc/aqc_en.html

ESTOC

This product is an integrated dataset of ocean observations including Argo data by using a four dimensional variational (4D-VAR) data assimilation approach. ESTOC is the open data that consists of not only physical but also biogeochemical parameters for 60 years during 1957-2016 (See the website

in JAMSTEC, <https://www.godac.jamstec.go.jp/estoc/e/>). The dataset will be updated for physical parameters for 65 years during 1957-2022.

JCOPE (Japan Coastal Ocean Predictability Experiment)

JCOPE is a research project for prediction of the oceanic variation using ocean models with assimilation of remote-sensing and in-situ data, which is managed by JAMSTEC. In 2019, JCOPE2M, which is updated version of JCOPE2/FRA-JCOPE2 reanalysis covering the Northwestern Pacific, was released. The Argo data are used by way of GTSPP. The hindcast data 6 months back and the forecast data 2 months ahead are disclosed on the following website: <https://www.jamstec.go.jp/jcope/htdocs/e/home.html>. More information is shown in <https://www.jamstec.go.jp/jcope/htdocs/e/distribution/index.html>. In 2022, JCOPE-FGO, a reanalysis product covering a quasi-global ocean, was released: <https://www.jamstec.go.jp/jcope/htdocs/e/distribution/fgo.html>.

- Publicly available software tools to access
None.

5. Regional Centre Functions

If your Nation operates a regional centre, report the functions performed and any future plans.

Pacific Argo Regional Center (hereafter, PARC) is operated by JAMSTEC since 2019 when IPRC terminated to co-operate due to their funding and human resource issue. However, IPRC (APDRC) actively provides various products. Users can easily and freely download products from <http://apdrc.soest.hawaii.edu/>.

JAMSTEC has renewed PARC website in October 2024 (<https://www.jamstec.go.jp/PARC/>). In the PARC web site, the statistics, time series of number of Core and BGC profiles in the Pacific etc., are shown. The web site provides the meta-information, time section figures, and time series of error magnitude on floats with data which deviate significantly from the MOAA GPV.

JAMSTEC has also released the information of Pacific Deployment Coordination Group and its activities on the PARC website:

https://www.jamstec.go.jp/PARC/float_deployment.

This page provides for PIs and users related to the Pacific region to communicate with each other. You can see lots of information, including reports of the group meetings and members.

We also plan to develop a few new functions; to share information of technical problems and quality control of data including Core, BGC, and Deep Argo floats among PIs, and DMQC operators and users in the next year.

6. Other Issues

Please include any specific comments on issues you wish to be considered by the Argo Data Management Team. These might include tasks performed by OceanOPS, the coordination of activities at an international level and the performance of the Argo data system.

JMA and JAMSTEC provide Argo-related figures on each web site using data in the OceanOPS server, e.g., “argo_operational.csv”. The programs create the figures on their servers routinely.

The OceanOPS frequently changes data format and directory structure, like delimiters of their files and csv files. The changes in OceanOPS make us frustrated, because we need to modify their programs and contents, while sometimes it is difficult for us to modify promptly due to busy schedules for other businesses.

We would like to ask the OceanOPS to announce for DACs, PIs, or users in advance when they plan to change the format, contents and directory structure, at least within one month.