Argo National Data Management Report

1. Status

The Japan DAC, the Japan Meteorological Agency (JMA), has processed data from 1851 Japanese Argo and Argo-equivalent floats including 115 BGC floats, of which 225 are active floats including 23 BGC floats, as of November 19th, 2021. There are 11 Japanese PIs who agreed to provide data to the international Argo data management. The DAC is acquiring ARGOS messages from CLS and getting IRIDIUM messages via e-mail and WebDAV server in real-time, thanks to the understanding and the cooperation of PIs. Almost all profiles from those floats are transmitted to GDACs in the netCDF format and issued to GTS using BUFR codes after real-time QC on an operational basis.

The Japan Agency for Marine-Earth Science and Technology (JAMSTEC) is in charge of operating the Delayed Mode QC for all Japanese floats, providing Argo QC'ed data in collaboration with JMA. The delayed mode QC for the 16,027 profiles observed by Japanese floats from November 19th, 2020 to November 19th, 2021 are in progress. JAMSTEC decoded 11,530 profiles of these, which were acquired as ARGOS messages and Iridium messages from November 19th, 2020 to November 19th, 2021. JAMSTEC sent 16,498 delayed profile files (D-files) to GDACs through the Japan DAC, JMA, during the period.

JMA and JAMSTEC have converted the meta-, prof-, tech-, and traj-files of Japanese floats, including APEX, DeepAPEX, PROVOR, ARVOR, NEMO, NOVA, Navis, NINJA, DeepNINJA and S2A. JMA and JAMSTEC have converted most all of Japanese meta-files from v2 to v3.1 and submitted them to GDAC. JMA has converted almost all of Japanese tech-files and submitted them to GDAC. Accordingly, JMA has converted the Rprof-files of Japanese ARGOS floats, except floats with NST sampling scheme and Iridium floats. JAMSTEC has converted all v2 Dprof-files of Japanese floats to v3.1 and submitted them to GDAC. JMA has converted about 30% of Japanese traj-files from v2 to v3.1 and submitted them to GDAC.
JMA has made meta-, tech-, traj-, and Rprof-files v3.1 of the almost all of floats newly deployed since March 2016 and JAMSTEC has made meta-files in v3.1 of JAMSTEC's floats newly deployed since October 2015. JAMSTEC has made Dprof-files in v3.1 since January 2016.

Due to a network security incident occurred at JAMSTEC in mid-March 2021, JAMSTEC's servers could not connect to the internet, and JAMSTEC was temporarily unable to send the raw data files of its Iridium communication floats to JMA. The internet connection of JASTEC has not been completely restored yet, so that the raw data files of the target floats are not sent to JMA in real time at this time. Therefore, the delivery time of the Rprof-/BRprof-files and traj-files to GDAC tends to be delayed, at least over 24 hours. JAMSTEC's internet connection is expected to be fully restored around March next year.

Web pages:

Japan Argo

http://www.jamstec.go.jp/J-ARGO/index_e.html

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. This site has been currently unavailable since mid-March 2021, due to a network security incident at JAMSTEC as described in the previous subsection.

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.

Delayed mode Database (Argo JAMSTEC)

http://www.jamstec.go.jp/ARGO/argo_web/argo/?lang=en

JAMSTEC's website shows mainly Japanese float list, trajectory map, profile chart, and QCed float data. Brief profile figures of the selected floats are also shown. This site also shows global maps based on objective analysis (temperature, salinity, potential density, dynamic height, geostrophic current, mixed layer depth, etc.). This site has been currently unavailable since mid-March 2021, due to a network security incident at JAMSTEC as described in the previous subsection.

Statistics of Argo data usage:

Operational models of JMA

MOVE/MRI.COM-G2 (Multivariate Ocean Variation Estimation System/ Meteorological Research Institute Community Ocean Model – Global 2)

JMA operates the MOVE/MRI.COM-G2, which replaced the previous version (MOVE/MRI.COM) in June 2015, for the monitoring of El Niño and the Southern Oscillation (ENSO) and for initialization of the seasonal prediction model (JMA/MRI-CGCM2). The MOVE/MRI.COM-G2 consists of an ocean general circulation model (OGCM) and an objective analysis scheme.

For details please visit:

https://ds.data.jma.go.jp/tcc/tcc/products/elnino/move_mricom-g2_doc.html

JMA/MRI-CGCM2 (JMA/MRI - Coupled ocean-atmosphere General Circulation Model 2)

JMA operates JMA/MRI-CGCM2, which replaced the previous version (JMA/MRI-CGCM) in June 2015, as a seasonal prediction model and an ENSO prediction model. The oceanic part of this model is identical to the OGCM used for the MOVE/MRI.COM-G2.

For details please visit:

https://ds.data.jma.go.jp/tcc/tcc/products/model/outline/cps2_description.html

MOVE/MRI.COM-JPN (Multivariate Ocean Variation Estimation System/ Meteorological Research Institute Community Ocean Model - an operational system for monitoring and forecasting coastal and open ocean states around Japan)

JMA operates MOVE/MRI.COM-JPN, which replaced the previous version (MOVE/MRI.COM-WNP) in October 2020. MOVE/MRI.COM-JPN provides daily, 10day-mean and monthly products of subsurface temperatures and currents for the seas around Japan and North Pacific Ocean.

Other operational models

JCOPE2 (Japan Coastal Ocean Predictability Experiment)

JCOPE2 is the model for prediction of the oceanic variation around Japan which is operated by JAMSTEC. JCOPE2 is the second version of JCOPE, developed with enhanced model and data assimilation schemes. In 2019, JCOPE2M, which is updated version of JCOPE2/FRA-JCOPE2 reanalysis, was released. The Argo data are used by way of GTSPP. The hindcast data 6 months back and the forecast data 3 months ahead are disclosed on the following web site:
http://www.jamstec.go.jp/frcgc/jcope/. More information is shown in
http://www.jamstec.go.jp/frcgc/jcope/htdocs/e/home.html
This site has been currently unavailable since mid-March 2021, due to a network security incident at JAMSTEC as described in the previous subsection.

FRA-ROMS

FRA-ROMS is the nowcast and forecast system for the Western North Pacific Ocean developed by Japan Fisheries Research and Education Agency (FRA) based on the Regional Ocean Modeling System (ROMS). FRA started the operation in May 2012. The forecast oceanographic fields are provided every week on the website http://fm.dc.affrc.go.jp/fra-roms/index.html/.

Products generated from Argo data:

Products of JMA

El Niño Monitoring and Outlook / Indian Ocean Dipole

JMA issues on a monthly basis an ENSO diagnosis and six-month outlook as well as an IOD analysis on the following web site. The outputs of the MOVE/MRI.COM-G2 and the JMA/MRI-CGCM2 can be found here.
https://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

Subsurface Temperatures and Surface Currents in the seas around Japan

The following parameter outputs of MOVE/MRI.COM-JPN was newly released in December 2021 and can be found on https://www.data.jma.go.jp/goos/data/database.html. They replace the conventional outputs of MOVE/MRI.COM-WNP, the release of which will be stopped in the near future.

- 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.

Products of JAMSTEC

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2. Delayed Mode QC

JAMSTEC has done the DMQC for all Japanese floats. JAMSTEC has submitted the delayed mode files of 175,121 profiles to GDACs as of November 19th, 2021.
The procedure of DMQC in JAMSTEC is as follows.

(JAMSTEC floats and the most of Argo-equivalent floats)

1. (within 10days) data re-acquisition from CLS, bit-error repair (if possible), real-time processing, position QC, visual QC
2. (within 180days) surface pressure offset correction, cell TM correction (Apex only)
3. (after 180days) WJO and OW salinity correction, the definitive judgement by experts, D-netCDF file making

(Argo-equivalent floats that had ceased by 2007)

JMA executes real-time processing again by using the latest procedure. The procedure after real-time processing is executed by JAMSTEC according to the procedure describe above.

The OW software is mainly operated instead of WJO. The calculation result of OW has been used at the definitive judgment. The result OW has been used just for reference.

JAMSTEC has adjusted salinity data of Deep floats by using optimal CPcor for each Deep float. When our Deep float is launched, shipboard-CTD observation is often performed. Therefore, for the optimal CPcor for each Deep float is estimated by comparing its first profile with shipboard-CTD data at its deployment.

And, JAMSTEC has started performing delayed mode QC for our BGC floats. We are now preparing to processing programs for DOXY-DMQC. We are also testing whether Nitrate and pH observed by our BGC floats in the North Pacific are corrected well by SAGE. We aim to start to release D-mode DOXY_Adjusted of our BGC floats to GDAC next year.

3. Regional Centre Functions

JAMSTEC operates PARC in cooperation with IPRC and CSIRO and has extended the responsible region into the whole Pacific.
JAMSTEC is providing the float monitoring information in the Pacific region (e.g., float activity watch, QC status, anomaly from objective analysis, diagnosis plot for sensor correction, etc.), reference data set for DMQC (SeHyD and IOHB), the link to the CTD data disclosure site of Japanese PIs, some documents, and some QC tools on the following web pages (http://www.jamstec.go.jp/ARGORC/). Unfortunately, this site has been currently unavailable since mid-March 2021, due to a network security incident at JAMSTEC as described above.
JAMSTEC has been building the new PARC websites since last year. We 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, DMQC operators and users, and to coordinate float development opportunities. The site is going to be more user-friendly than its current version. Since JAMSTEC's internet connection is expected to be fully restored around March next year, we will release the new version of PARC websites in 2022.