

China National Argo Report for AST-8 Meeting

Submitted by Prof. Xu Jianping

The Second Institute of Oceanography, SOA, China

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The status of China Argo Program

The implementation of China Argo Program has been supporting by the Ministry of Science and Technology, the State Oceanic Administration, and the National Natural Science Foundation of China. However, up to now the fund support is just in form of research projects, and the support ability of fund is limited. For which, scientists from the State Oceanic Administration, China Meteorological Administration and Chinese Academy Sciences, are appealing the government to set a special program giving long-term support.

1. Floats deployed

Since 2002, China has deployed 35 Argo floats in the northwestern Pacific and eastern Indian Oceans (Fig.1), in which there were 6 floats deployed in 2006. Among these floats, 20 are APEX floats and 15 are PROVOR floats. Presently there are 12 floats normally operating in oceans. The statistics of the floats survival ratio is shown as the Fig.2. The APEX float has the mean lifespan of 52 cycles, and the PROVOR float has only 25 cycles.

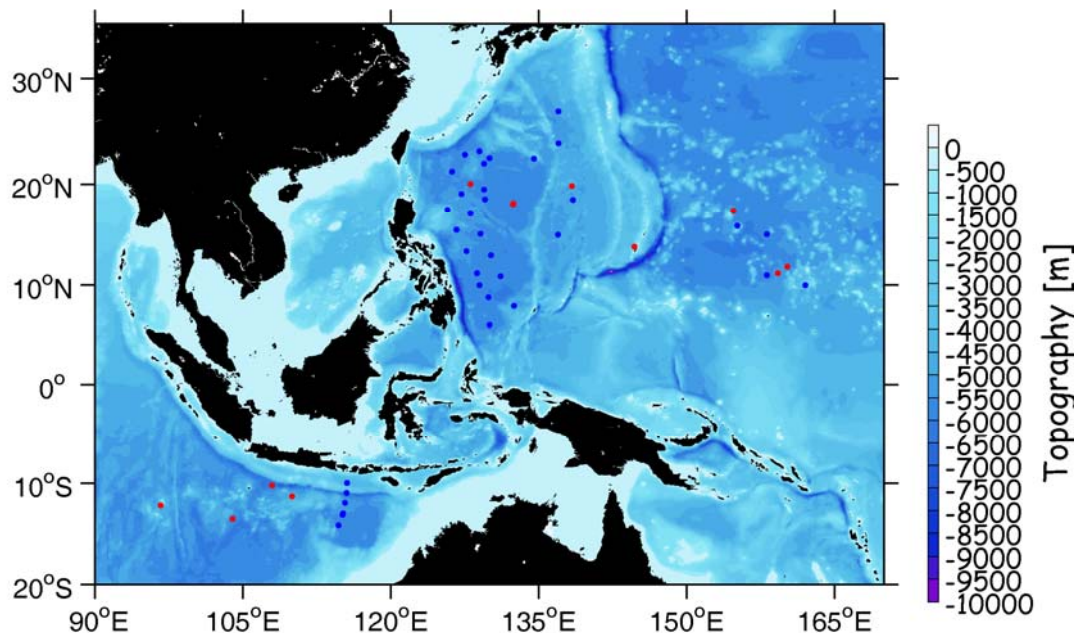


Fig.1 Locations of deployed (blue dots) and currently operating (red dots) Argo floats.

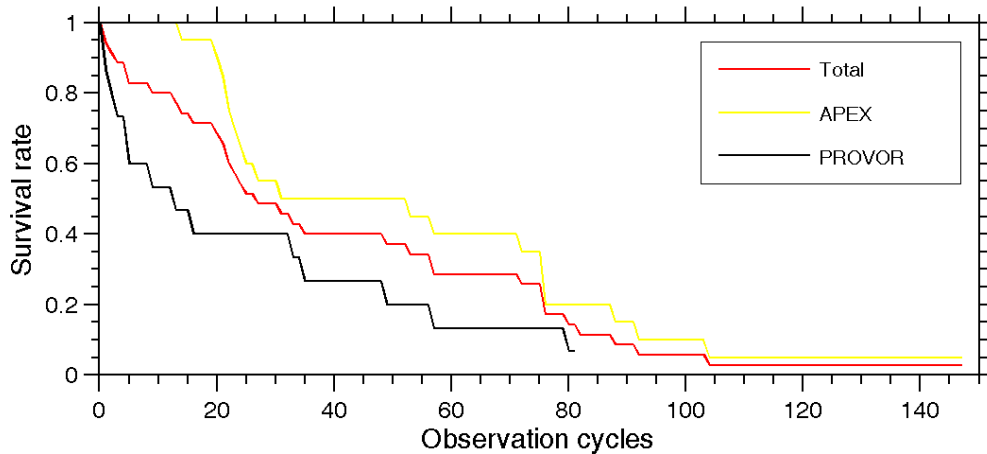


Fig.2 Survival rate estimated from all Argo floats (red), APEX (yellow) and PROVOR (black) as of 19 January 2007.

2. Technical problems encountered

There are three kinds of technical problems with the floats deployed by China Argo Program:

1) Energy flu

Among the 20 APEX floats, 2 floats encountered energy flu problem with the observed cycles of 56 and 91, respectively.

2) Druck pressure transducer problem

Among the 20 APEX floats, there are 2 floats existing Druck pressure transducer problem.

3) Other problems unknown reasons

As of the 15 PROVOR floats, 6 floats suddenly lost signals after observing several profiles, but the reason is unknown.

All these floats have the actual average operating period of 1-2 years, but the designed lifespan is 4-5 years. Obviously there exists a large difference between the actual lifetime and the designed, which once influenced the administration's confidence to the Argo Program.

The China developed profiling float — COPEX has almost finalized the design and tested in the sea, but it still needs long-time examination of reliability and stableness.

3. Status of Argo data management

1) Real-time data management

China Argo Real-time Data Center is responsible for receiving the data from all the floats deployed by China. All the data files are sent to GDACs as NetCDF format through a real-time QC, and profiles are inserted into the GTS under the help of CLS.

As of January 2007, the data center has sent 1338 profiles to GDACs.

2) Delayed-mode quality control (DMQC)

China Argo Real-time Data Center applies the WJO method to calibrate the salinity measurements. Up to now, 388 profiles after DMQC have been updated to GDACs. The work of thermal mass correction and surface pressure correction is in the stage of trying application. The profiles of all floats through DMQC are expected to upload into GDACs in 2007.

3) Argo floats information and data products

The global Argo data and related products are issued on the websites of China Argo Data Center (<http://www.argo-cndc.org/>) and China Argo Real-time Data Center (<http://www.argo.org.cn/>), including floats trajectories, T-S diagrams, T/S vertical profiles, and T/S horizontal distributions.

4. The operational application of Argo data

At present, Argo data has been widely used by research organizations under the jurisdiction of State Oceanic Administration, China Meteorological Administration, and Chinese Academy Sciences. Research results are involved in ocean circulation, water masses, mesoscale eddy, middle-layer circulation and thermocline distribution. The Chinese Academy of Meteorological Sciences has added the Argo profiles into the NCC-GODAS System, and this greatly improved the assimilating results, which has been released at the website of IRI/LDEO, Columbia University (<http://iridl.ldeo.columbia.edu/SOURCES/.CMA/.BCC/.GODAS/>). In addition, other research institutions are using Argo data in ocean data assimilation experiments, and reconstructing the T/S fields of the Pacific Ocean.

In June 2006, The Second Institute of Oceanography and the China Argo Real-time Data Center hosted the First China Argo Science Workshop in Hangzhou. There were about 50 scientists attended the meeting. The representatives discussed issues of the Argo data application, quality control, and floats technology development. The proceedings were published by China Ocean Press with the title of “Collection of Argo Application Papers”, which includes over 20 papers.

The China Argo Data Center hosted the 7th Argo Data Management Meeting (ADMT-7) during November 1-3, 2006, in Tianjin, China. 36 scientists participated in the meeting from 9 countries.

Floats Deployment plans and future funding

1. Year Plan of 2007

2007 is the key year for the Global Argo Project to complete the construction real-time ocean observing network. The Ministry of Science and Technology and the State Oceanic Administration are planning to fund 10 million RMB, to deploy about

50 floats in the region of Western Pacific and Eastern Indian Ocean. And there is a plan to use the GTS node at China Meteorological Administration, to promote the China Argo data to be shared by all the global Argo member countries.

The Ministry of Science and Technology also plans to fund 5 million RMB for the COPEX float's reliability and stableness test in the sea, trying for forming the ability of small scale producing within 2 years.

2. 5 years plan

The Ministry of Science and Technology, and the State Oceanic Administration are positively looking for channel of national special program to support Argo project. The plan is, in the coming 5 years, to fund 10 million RMB each year to deploy 50 floats in the region mentioned above, i.e. in the period of 2008-2012 the total deployed floats reaches 250-300.

The Chinese polar research vessel "Xue Long" sails for Antarctic each year through November to March of the next year, to undertake the polar scientific investigation, and provide the logistics for Chinese Antarctic Scientific Stations of "Great Wall" and "Zhong Shan". Another research vessel "Da Yang 1", after finishing the global ocean voyage in 2006, it began the half year's Pacific—Indian ocean exploration from January 2007 (Fig.3). The floats of China Argo Program were deployed mostly by these two research vessels. We also with pleasure provide opportunities for the other Argo member countries to deploy the floats in regions of Pacific Ocean, Indian Ocean, and the Southern Ocean.

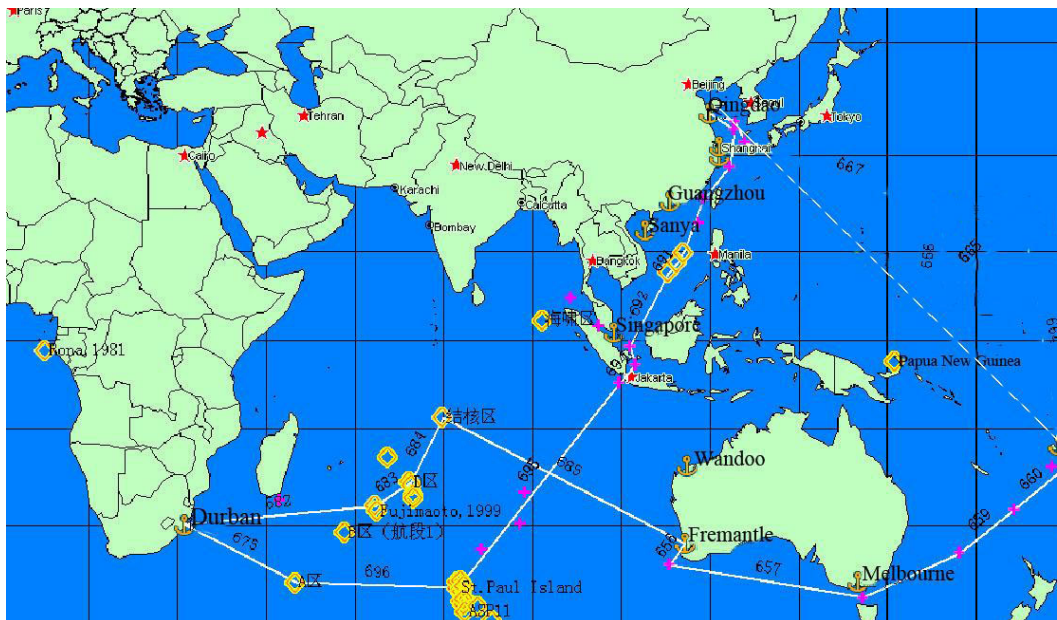


Fig.3 Cruise track of RV "Da Yang 1" during January-August, 2007.

China Argo Real-time Data Center, the State Key Laboratory of Satellite Ocean Environment Dynamics, and the Second Institute of Oceanography, State Oceanic Administration, hope to host the 3rd International Argo Science Workshop in Hangzhou, China, to make the contribution of promoting Argo data to be used more widely and the Argo Project sustainable development.

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