MOAA GPV

Grid Point Value of the Monthly Objective Analysis using the Argo data

Quick instruction

April 11, 2014

JAMSTEC

1. About MOAA GPV

JAMSTEC produces a gridded dataset named "MOAA GPV" (**G**rid **P**oint **V**alue of the **M**onthly **O**bjective **A**nalysis using the **A**rgo data) for the global mapping of temperature and salinity in quasi-real time. The gridded data is created from January 2001 by using 2-D optimal interpolation method with Argo float, TRITON mooring and available CTD data with both temperature and salinity profiles (e.g., White, 1995). From the gridded temperature and salinity data, we show monthly horizontal distributions of global temperature, salinity and those anomalies based on WOA01 climatology, not only in surface layer but also subsurface and deeper layers (http://www.jamstec.go.jp/ARGO/argo_web/prod/oi_prs_e.html) (Boyer et al., 2002; Stephens et al., 2002). The grid point values are also available via the web site, with analyzed values such as potential density and dynamical height. Summary, specification and notice for use of MOAA GPV are listed below. If users want to know about MOAA GPV in detail, please refer the technical document (Hosoda et al., 2008).

Table1. Summary of MOAA GPV.

Method	2-dimensional optimal interpolation on pressure surface
Parameters	Temperature and salinity
Areas	Global Ocean (70.5°N-60.5°S, 0.5°-359°E) Pacific 60.5°N-60.5°S, Atlantic 70.5°N-60.5°S, Indian 30.5°N-60.5°S (Including Bering Sea and Excluding marginal seas)
Resolution	Horizontal: 1°x1°, 25levels from 10 – 2000dbar (Standard pressure levels: 10, 20, 30, 50, 75, 100, 125, 150, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1750, 2000 dbar)
Data Source	Argo floats, TRITON buoys, available CTD casts (corporated with JMA, JGC and JODC)
Period	From January, 2001 – on going (monthly)

Table2. Conditions for profile selection.

Maximum depth	Deeper than 900 dbar
Minimum depth	Shallower than 15 dbar
Number of observed levels	More than 15 levels

Spacing of observed levels	< 400 dbar: Less than 50 dbar, 400 – 1000 dbar: Less than 100 dbar > 1000 dbar: Less than 300 dbar

1-1. Filename example

The conventions of NetCDF format for MOAA GPV have been registered with Unidata as the COARDS convention. Users can be converted for Ascii, GrADS, or Ocean Data View (ODV) format using ncdump in NetCDF utilities.

TS_YYYYMM_GLB.nc
RG_YYYYMM_GLB.nc

・"YYYYMM" is year and month.
・"TS" include Temperature (ITS90), Temperature interpolation error (ITS90), Salinity (PSS-78), and Salinity interpolation error (PSS-78) parameters.
・"RG" include Potential density (kg/m3), and Dynamic height (m2/s2) parameters.
・Potential density and Dynamic height were calculated from the temperature and salinity.

・File header information (NetCDF header).

```
netcdf TS_200707_GLB {
dimensions:
        LONGITUDE = 360 ;
        LATITUDE = 132 ;
        PRES = 25 ;
variables:
        float LONGITUDE(LONGITUDE) ;
                LONGITUDE:name = "LONGITUDE" ;
                LONGITUDE:units = "degrees_east" ;
        float LATITUDE(LATITUDE) ;
                LATITUDE:name = "LATITUDE" ;
                LATITUDE:units = "degrees_north" ;
        float PRES(PRES) ;
                PRES:name = "PRES" ;
                PRES:long_name = "Pressure" ;
```

```
                PRES:positive = "down" ;
                PRES:units = "decibar" ;
        float TOI(PRES, LATITUDE, LONGITUDE) ;
                TOI:name = "TOI" ;
                TOI:long_name = "Temperature.(ITS90)" ;
                TOI:_FillValue = 99999.f ;
                TOI:units = "degree_Celsius" ;
        float TOI_ERR(PRES, LATITUDE, LONGITUDE) ;
                TOI_ERR:name = "TOI_ERR" ;
                TOI_ERR:long_name = "Temperature Interpolation Error." ;
                TOI_ERR:_FillValue = 99999.f ;
                TOI_ERR:units = "degree_Celsius" ;
        float SOI(PRES, LATITUDE, LONGITUDE) ;
                SOI:name = "SOI" ;
                SOI:long_name = "Salinity.(PSS-78)" ;
                SOI:_FillValue = 99999.f ;
                SOI:units = "psu" ;
        float SOI_ERR(PRES, LATITUDE, LONGITUDE) ;
                SOI_ERR:name = "SOI_ERR" ;
                SOI_ERR:long_name = "Salinity Interpolation Error." ;
                SOI_ERR:_FillValue = 99999.f ;
                SOI_ERR:units = "psu" ;

// global attributes:
                :Conventions = "COARDS" ;
                :Title = "Argo OI TS 2007JUL Global ocean" ;
                :Version = "Created Aug.22,2007 by JAMSTEC/IORGC/ArgoGroup" ;
}
```

2. Notice of use of MOAA GPV

- Reprint without permission, the re-distribution, the modification, and the commercial use are prohibited though JAMSTEC doesn't disturb the free use of this data in principle.

S. Hosoda, T. Ohira, T. Nakamura, 2008: A monthly mean dataset of global oceanic temperature and salinity derived from Argo float observations. JAMSTEC Rep. Res. Dev., Vol. 8, 47-59.

- Please source the above when you make the result using this data public.
- JAMSTEC doesn't assume the responsibility to any damage of the user of this data.

3. References

Boyer, T. P., C. Stephens, J. I. Antonov, M. E. Conkright, R. A. Locarnini, T. D. O'Brien, and H. E. Garcia (2002): World Ocean Atlas 2001, vol. 2: Salinity, NOAA Atlas NESDIS 50, U.S. Gov. Print. Off., Washington, D. C., 165pp.

Hosoda, S., T. Ohira, and T. Nakamura (2008): A monthly mean dataset of global oceanic temperature and salinity derived from Argo float observations. JAMSTEC Rep. Res. Dev., Vol. 8, 47-59.

Stephens, C., J. I. Antonov, T. P. Boyer, M. E. Conkright, R. A. Locarnini, T. D. O'Brien, and H. E. Garcia (2002), World Ocean Atlas 2001, vol. 1: Temperature, NOAA Atlas NESDIS 49, U.S. Gov. Print. Off., Washington, D. C., 167 pp.

White, W. B. (1995), Design of a global observing system for gyre-scale upper ocean temperature variability, *Prog. Oceanogr., 36*, 169-217.