

Trajectory file format status and path forward

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Argo Steering Team Meeting
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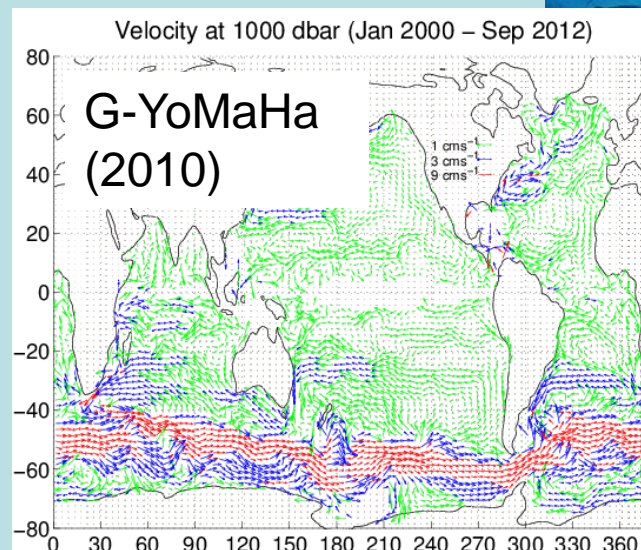
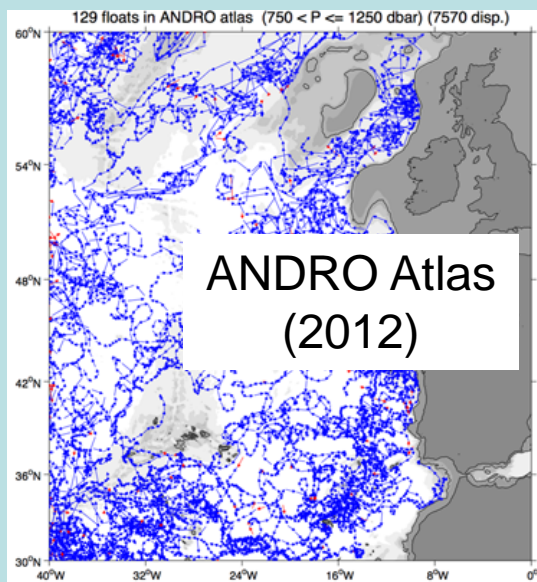
Overview

- Introduce new Trajectory 3.0 file format
 - Motivation for new format
 - Highlight changes
- Explanation of R and D trajectory file system
 - Who is responsible for R and D files
 - How will D files be produced?
- Path forward
 - Timeline for transition to 3.0 in real time
 - Dmode for trajectory files



Motivation for a new trajectory file

- Needed additional cycle timing variables
 - Important for velocity calculations
- Needed more flexibility and detail in describing what measurements occur during the float cycle
 - Important for both newer float models (SOLO-II, NAVIS, etc) and older float models
- Needed more consistency across DACs and with other Argo files
- Trajectory files being more widely used
 - velocity products being produced

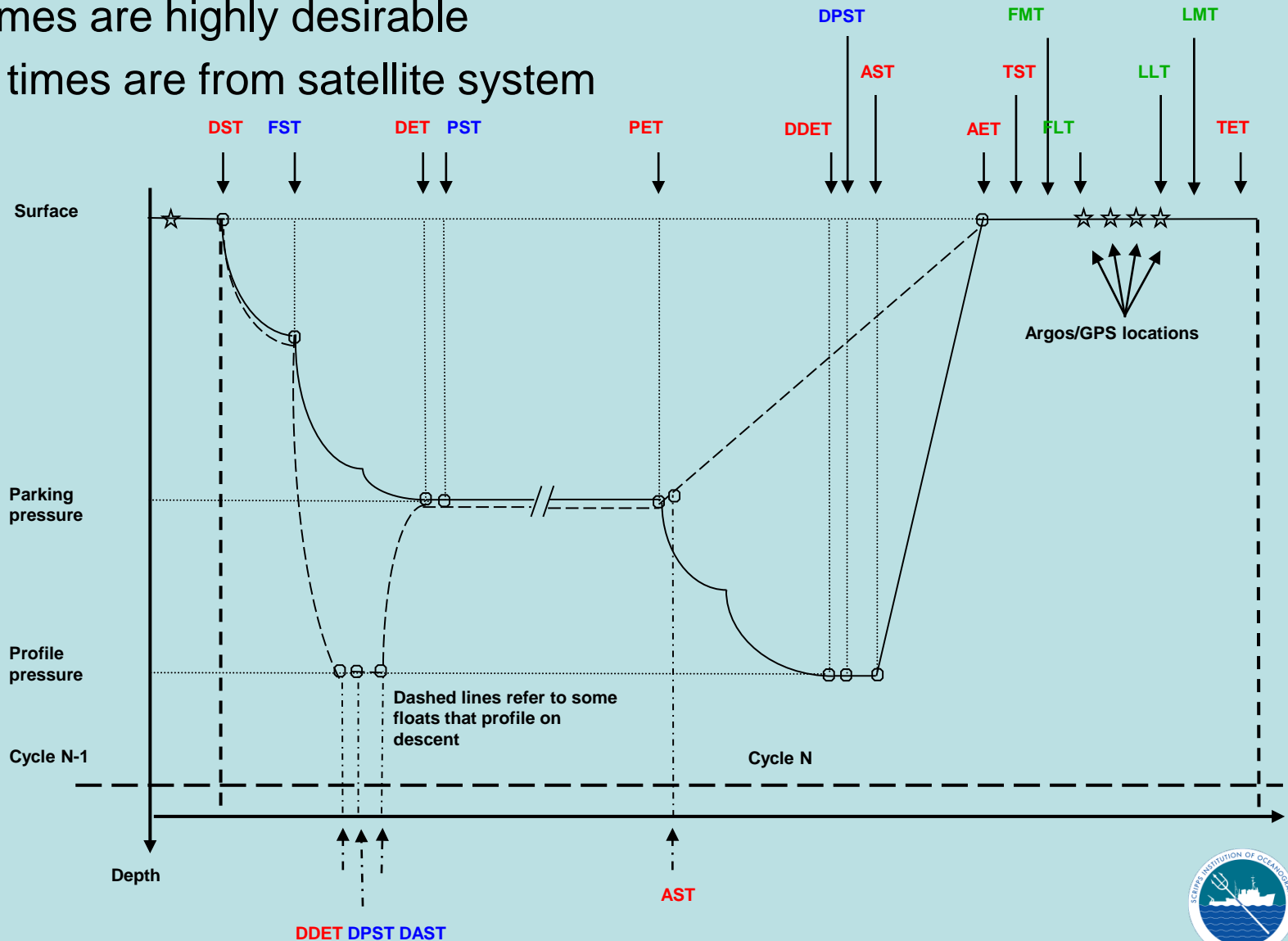


YoMaHa'07:
Velocity data assessed from trajectories of Argo floats at parking level and at the sea surface
Konstantin V. Lebedev, Hiroshi Yoshinari, Nikolai A. Maximenko, and Peter W. Hacker
IPRC Technical Note No.4(2)
June 12, 2007



Updated cycle timing variables

- Red times are mandatory for floats that experience that time
- Blue times are highly desirable
- Green times are from satellite system



More flexibility to describe actual measurements

Measurement Code (MC) with values range from 0-999

Defined categories of MC codes

- Primary MC : Mandatory cycle timing variables (100,200,300,etc)
- Secondary MC : Suggested, float specific variables(150,250,etc)
- Relative Generic Codes (MC-24 to MC-1)
 - Generic definitions allow application to wide range of floats/ data
 - Example: mean P/T/S taken during drift
 - Every Primary & Secondary MC has a set of 'Relative' codes
 - Relative Specific Codes (MC+1 to MC+25)

Subset of Measurement Code Table

Relative Generic MC

476-499	see above table	Any measurement recorded during transition towards AST	
500	AST	All measurements made at the start of the float's ascent to the surface Time (JULD_ASCENT_START)	Time: APEX APF9, PROVOR, ARVOR, SOLO-II, NEMO, NEMOIR, POPS
501		Down-time end date: end date of the down-time parameter reported by APEX floats	APEX
502		Ascent start date directly transmitted by APEX floats	APEX
503		Deepest bin reached during ascending profile	
504-525	unassigned	Reserved for specific timing events around AST.	

Primary MC →

Relative Specific MC's ↗ ↘

Consistency across DACs & with other Argo files

- Created the DAC cookbook to document how to fill the trajectory 3.0 format for each float type, including newer floats
- Added JULD_ADJUSTED and CLOCK_DRIFT variables to match other *ADJUSTED variables
- Added clear link in both the N_MEASUREMENT (measurement) array and the N_CYCLE (cycle timing) array within trajectory file to the cycle number in profile files on GDAC
- Decided on a two-file trajectory system – a real time file (R) and a delayed mode file (D) where both files are in the same format
- Will need to educate users on all these changes



Real Time (R) and Delayed mode (D) file system

Real Time (R) files

- Contain only raw data for the float's trajectory
- Created by DACs based on instructions in DAC cookbook
- Exist when :
 - there is no dmode data for a float
 - or
 - there are recent cycles that have not yet been dmoded
(RWMO_traj.nc for all cycles)

DMode (D) files

- Contain both raw and delayed mode data
- Created by PIs/ scientists familiar with floats
- Exist when :
 - float dies & all cycles have been dmoded (replaces R file)
 - or
 - there are some cycles that have been dmoded (DWMO_traj.nc for float's DM cycles)

R & D file system continued

- Example :
- Float has completed 100 cycles; first 25 are D-moded based on information provided by ANDRO covering the period through 2009. Float lived on, but no more ANDRO data available.
 - RWMO_traj.nc file contains raw data for all 100 cycles
 - DWMO_traj.nc file contains raw and delayed mode data for first 25 cycles
- All the details still need to be worked out with the DACs and described in DAC cookbook and on ADMT, AST websites

Timeline for R files

- Finalize traj3.0 format and DAC cookbook
 - Done by end of April
- Educate users on changes to traj file, including R and D versions, on ADMT, AIC and AST websites by end of April
 - **Action item on this?**
- DACs begin producing R files based on cookbook – all DACs aim to transition to traj3.0 by next ADMT
- GDACs expect to be able to accept both RWMO_traj.nc and DWMO_traj.nc starting in June
- Bonus that new traj3.0 format, along with DAC cookbook, allows some older floats to include more timing information important for velocity calculations in R format
- Newer floats can include much of their data in the R format



How will D files be produced?

- Some DACs will be starting with D traj3.0 files produced by Coriolis based on ANDRO Atlas work done by M. Ollitrault and JP Rannou
 - Coriolis
- Some DACs may want to learn how to produce their own D files
 - BODC, CSIRO, MEDS?
- Some PIs/ dmoders want to produce their own D files
 - J. Gilson, other US float providers for AOML
 - JAMSTEC for JMA



D traj3.0 files from ANDRO

- Coriolis is producing D traj3.0 files based on work done by M. Ollitrault and J-P Rannou to make the ANDRO database (ANDRO & DEP files freely available at : <http://wwz.ifremer.fr/lpo/Produits/ANDRO>)
- These D traj3.0 files will be distributed to all DACs for data through the end of 2009
- The D traj3.0 files are a starting place for a DWMO_traj.nc file, but additional work needs to be done before they can be placed on the GDACs
 - There will not be a clear link to profile cycle number on GDAC – DACs who want to use these files will need to make that link
 - Need to better understand positions included in D traj3.0 files from ANDRO – quick comparisons by J. Gilson and M. Scanderbeg have found differences between their traj file positions and ANDRO



How to move forward for D files

- PIs and DACs need to work together to decide who will be producing D files
 - Might be a combination of work done by DACs to D traj3.0 files delivered by ANDRO and work done by PI
- Timeline to DWMO_traj.nc files being on GDACs is likely longer than for RWMO_traj.nc files & dependent upon PIs and DACs
- Start thinking about float experts working together to come up with standard dmode procedures for older float types



Update ANDRO?

- It would be possible to fund M. Ollitrault and JP Rannou to produce ANDRO through the end of 2012. The cost to update ANDRO and produce the valid trajectories and DEP file would be =>
- There would be additional costs if new decoders are required (almost certain)
- Corilis is funding them to produce D files through 2012

DAC	# FLOATS	Cost (euros)
CSIRO	450	16,500
INCOIS	150	10,000
Coriolis	750	40,500
AOML	3000	93,000
BODC	200	14,000
JMA	550	31,500
MEDS	200	14,000
KORDI	50	9,000
KMA	80	9,000
CSIO	50	6,000
NMDIS	?	9,500
Totals	> 5480	2 years - 253,000 (less if fully funded and not split)