

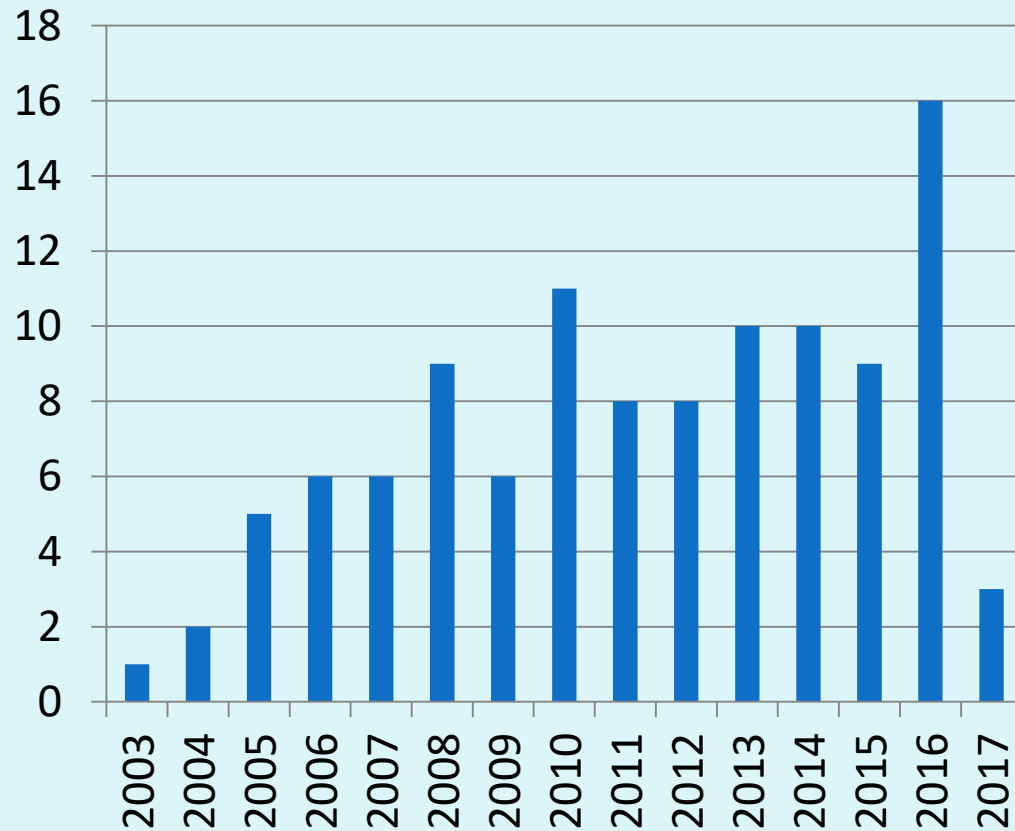
Status of v3.1 Trajectory Files

M. Scanderbeg, J. Gilson

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Papers using Argo trajectory files



- 100+ papers
- 4 papers focused on global velocity fields
- Most are regional studies
- 21+ papers used YoMaHa
- 12+ papers used ANDRO
- 8+ paper used gridded velocity products (G-YoMaHa or AGVA Grey-Riser product)
- 3+ assimilated into models



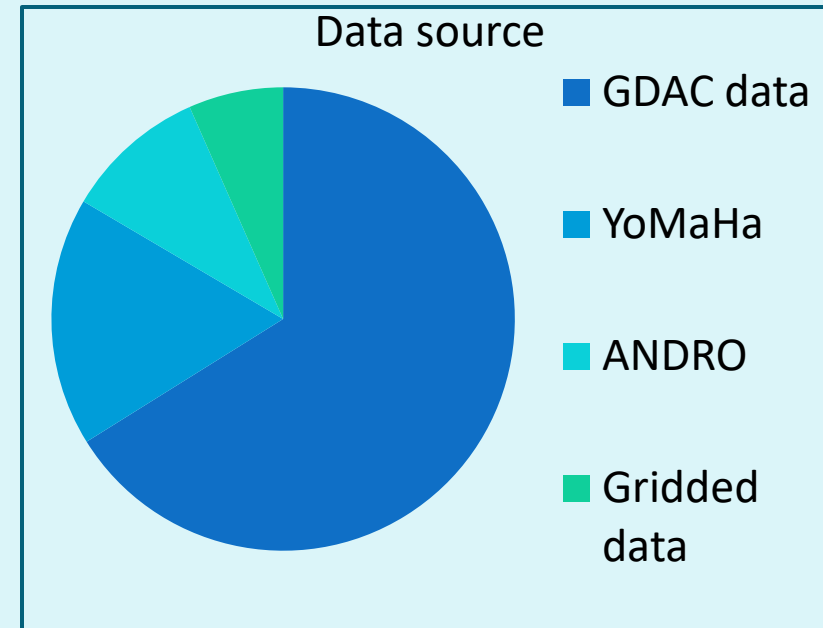
Potential ways to get velocities from Argo files

- Use traj files from GDACs
- Calculate velocities using preferred method of estimation
- Grid data if desired

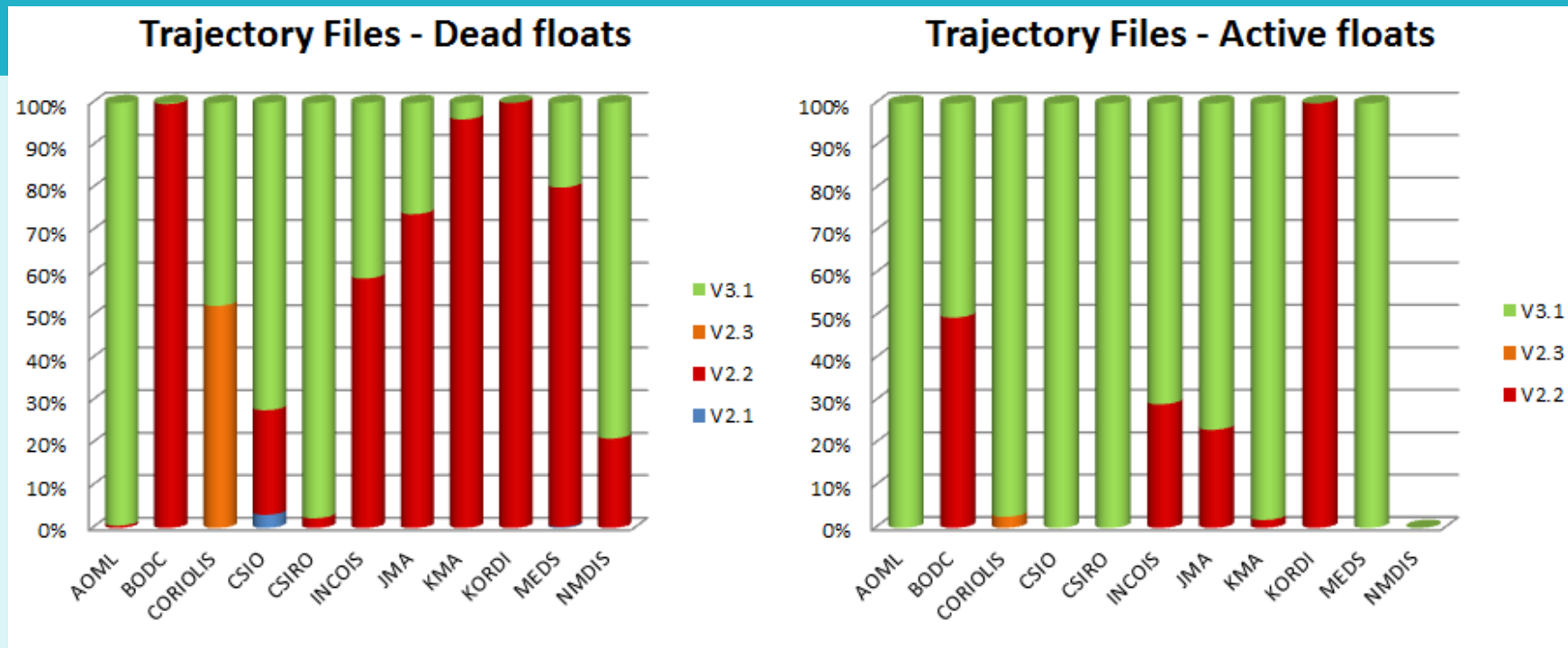
- Use 'curated' trajectory files like ANDRO or YoMaHa
- Grid data if desired

Use a gridded velocity product based on Argo like AGVA or G-YoMaHa

- Majority of papers still use GDAC data to calculate velocities
- Over time, likely that more papers will be published using other data sources as has been seen with Argo profile data



Status



- Most DACs are producing V3.1 files for some of their float types
- How are the contents of the files and are they more consistent across DACs than previous versions?
- FileChecker with v3.1 trajectory format checks is live-testing
- Are current v3.1 traj files on GDACs ready for dmode processing?

Survey of v3.1 traj files at DACs

- Asked each DAC to send me an example WMO for each float type available in current DAC cookbook
- Almost all DACs responded; clear that DACs are converting to v3.1 by float type
- Wanted to check for:
 - Consistency across DACs (Most float types; SOLO/SOLO-II only at single DAC)
 - Whether DACs were following float type and float version tables in DAC cookbook
 - Check whether timing information was being included for primary and secondary measurement codes
 - Check basic agreement between N_MEASUREMENT array and N_CYCLE array
 - Arrangement of events in array
 - Whether P/T/S information was included, where and if times were attached



Survey results from DACs

APEX APF8	APEX APF9 with Argos	APEX APF9 with Iridium	NAVIS
AOML CSIRO Not yet: BODC Coriolis	AOML Coriolis CSIO CSIRO JMA Not yet: BODC	AOML CSIO CSIRO Not yet: BODC Coriolis JMA	AOML JMA Not yet: Coriolis CSIRO JMA

PROVOR	ARVOR	SOLO	SOLO-II	NOVA
Coriolis CSIO Not yet: JMA	BODC Coriolis CSIO JMA	AOML	AOML Not yet: JMA	Coriolis MEDS

- 'Not yet' information not complete as not all DACs provided this
- Suggest DACs in black work with DACs in green to improve traj files
- Sharing of decoders or other code could be helpful



Timing information

- Most mandatory primary timing measurement codes (MCs) are being included
 - Some times are not available, but MC is present
 - Widespread differences in which timing MCs have actual times for APEX APF9 floats due to the need for some of the times to be calculated by DAC
- Additional optional timing information depends on float type and DAC
 - SOLO-II, PROVOR/ARVOR have lots of timing info
 - Some DACs choosing only to include primary MCs, no secondary or relative MCs
 - Several DACs excluding DOWNTIME for APEX floats which is important to trajectory estimation



N_CYCLE vs N_MEASUREMENT

- **Good agreement between the two:** DACs fixed differences between STATUS flags and differences between actual JULD, JULD_ADJ and N_CYCLE times after AST-18
- File Checker designed to find inconsistencies and reject file if this occurs and check is active
- Not always a trivial task to find ‘best time’ for some of the times due to clock offset, several attempts at GPS fixes, under-ice profiles, etc.
 - If JULD_ADJUSTED in N_MEASUREMENT array is filled, that time goes in N_CYCLE array
 - If JULD_ADJUSTED in N_MEASUREMENT array is NOT filled, JULD goes in N_CYCLE array
 - Has to be looked at on a cycle by cycle basis



Arrangement of events

- Most DACs appear to be putting events in order that they occurred
- Some DACs were confused about timing of surface events for Iridium floats (assume the same as Argos, but this is not the case), but **this has been fixed since AST-18**



P/T/S measurements

- All files had drift measurements; some with times and some without
- Addition of MC makes it clear when in cycle measurement took place and what type of measurement it was (average, single, min/max, etc)
- Some floats include many pressure measurements along entire float cycle
- AOML added many APEX APF9 drift measurements after AST-18 to be more consistent with other DACs



Overall consistency

- Improving since AST-18, but still room for improvement
- Not all DACs using DAC Trajectory Cookbook
- Best for SOLO-II and PROVOR/ARVOR floats where decoders are being shared and/or measurement codes are included in float manuals
- Worse for APEX floats where timing information can be difficult to deal with because it isn't there or it doesn't fit well with Argo's desired times
- With Iridium, DACs get from various sources: PIs, Iridium itself, etc. May need to examine this link to ensure all important information is being transferred appropriately



DAC Trajectory Workshop

- Working groups to assign MCs for APEX, NAVIS and PROVOR for v3.1 trajectory and b-trajectory files
- Please download sample data if you haven't yet:
ftp://kakapo.ucsd.edu/pub/argo/DAC_traj_ws_data/DAC_Traj_WS_files.zip
- Update DAC Trajectory Cookbook based on feedback from workshop to include new float types (ie APF11) and to include all MCs for floats; not just timing MCs
- Discuss trajectory file checker, when it can become live and any possible additions
- Discuss consistency and ways to improve real time QC of trajectory files
- Encourage decoder/code sharing and MCs being added to float user manuals
- Delayed Mode trajectory files



How to move forward

- V3.1 trajectory files are complicated and need a float expert to help interpret how the data matches with MCs
- Continue outreach to manufacturers to improve consistency in cycle timing reporting and to add MCs into float user manuals (working with TWR on APF11)
- Consider a Delayed Mode Trajectory Workshop
 - Who will dmode trajectory files? Already falling behind on profile DMQC
 - Minimal real time QC done; nothing on P/T/S
 - Coordinate between RT and DM: things not done in RT need to be done in DM
 - Will all floats be expected to have a 'D' traj file? Some floats may need more timing estimation than others; will there be a minimum expectation?
 - Will outside products become like 'D' traj files?

