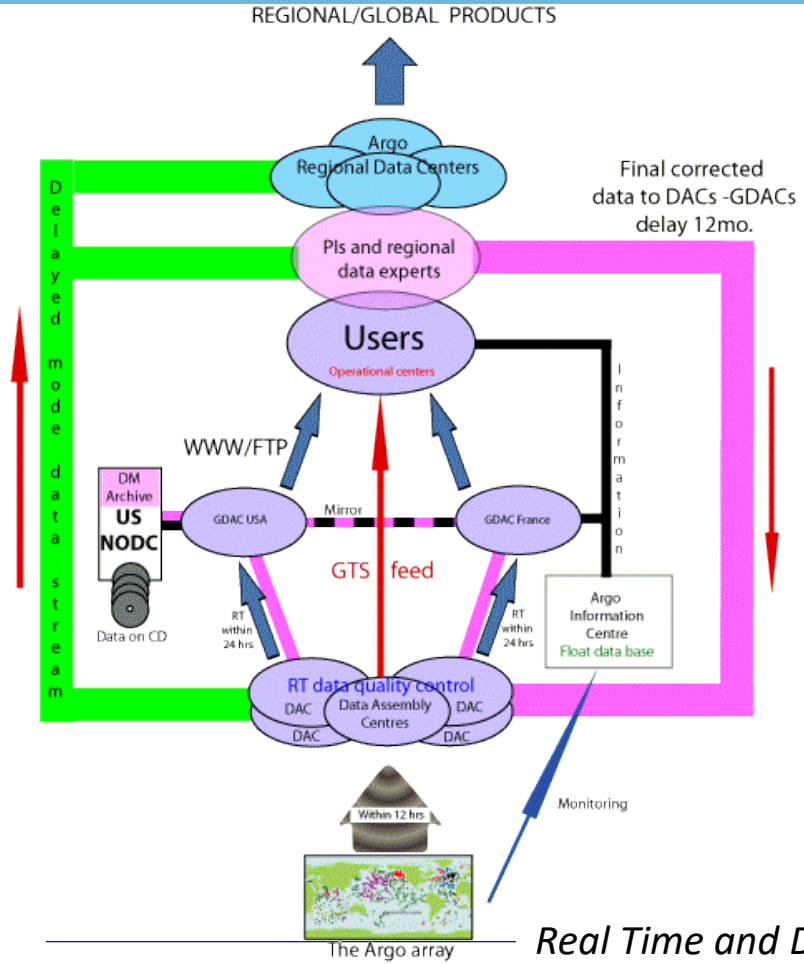
Argo data flow



- OO centers rely on different data flows and infrastructures to gather, quality control and deliver the in situ observation data sets to be assimilated.

- Some OO centers take the data on the GTS, so Argo data did not get throw the GDAC. Others have their own « data assembly center » that are conducting additional QC.

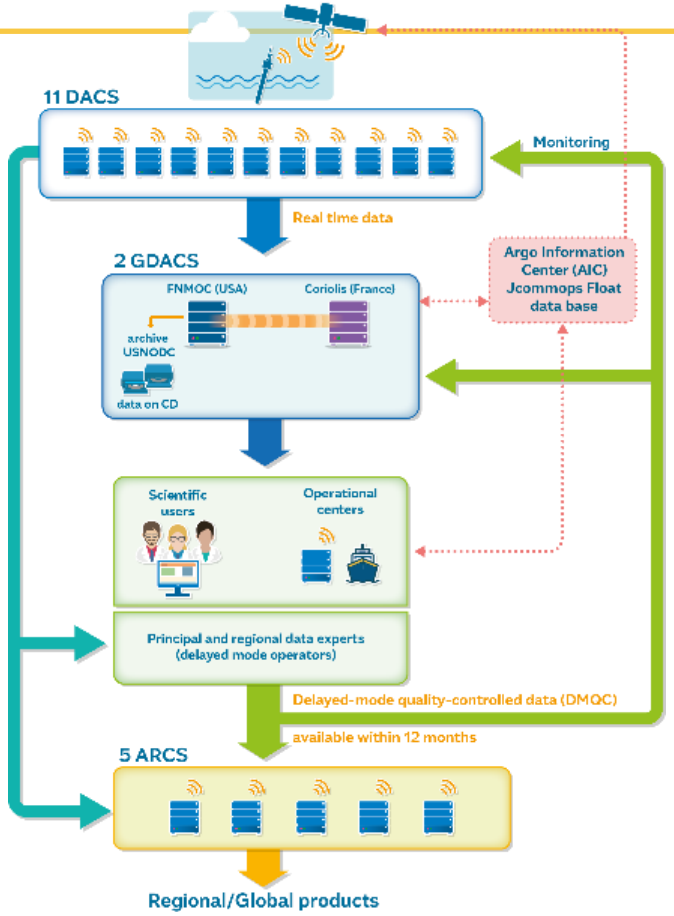
- Real Time and Delayed Time data flow differs.

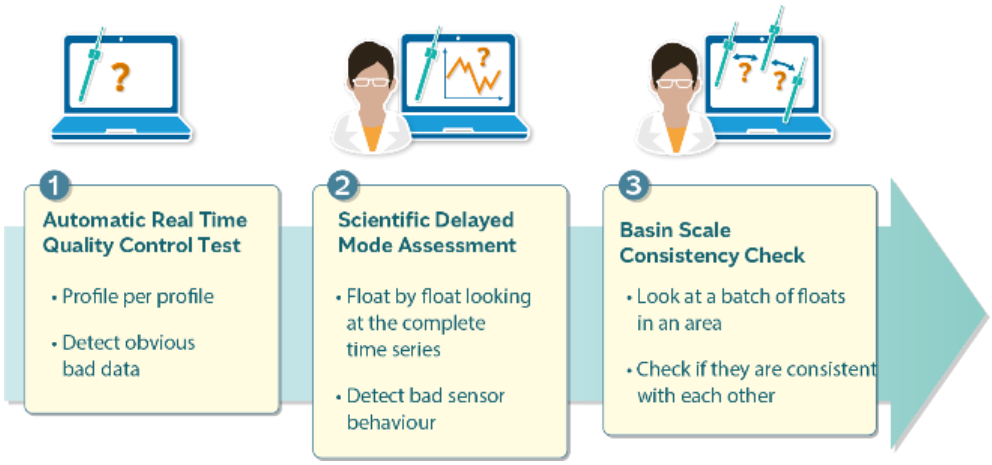
-> we (« assimilators ») are at the end of a complex chain. We need to understand and use the QC flags we get as our analysis are highly sensitive to data quality.

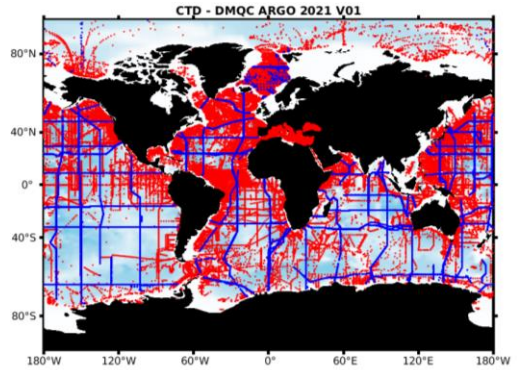
Argo is also specific compared to other in situ networks that do not benefit from a strong international coordination…

Real Time and Delayed Mode ARGO data flow (© AIC)

Argo Data System







EURO-ARGO.EU

History…

Tuesday 25 September 2018

http://www.argodatamgt.org/Documentation

Message to Argo users about an increased occurrence of salinity errors in the real time Argo data stream

Due to a manufacturing problem that occurred a few years ago, a larger than normal number of SeaBird Scientific CTD cells (SNs 6000 - 7100) used in Argo developed a high salinity bias within 2 years of deployment. Many of these CTDs are still active in Argo, and as result, a higher portion than normal of Argo real time data are subject to salinity errors larger than Argo's 0.01 accuracy target.

Today information available on the Argo webpage:

- Non exhaustive list of concerned platforms: http://argo.ucsd.edu/fast-salty-drifters-documented-by-dmqc-operators (around 550 platforms today)
- a list of sensor identified by SBE with a 'do not deploy' directive: https://argo.ucsd.edu/sea-bird-sbe41cp-and-sbe61-ctd-quality-concern/

- Not all the platforms are identified since the drift is slowing "developping".
- It could take up to 3 days for detected floats (Fast Salinity Drift) to be flagged to 3 by the DAC in RT.

On Argo side…

The ARGO steering team is working together with SEABIRD to find the origin of the problem.

ARGO steering team recommendations:

1) making the delayed-mode quality control as soon as possible in order to correctly flag the data and potentially apply corrections when possible
2) detecting in NRT the problem as early as possible, dedicating more man power to this specific problem
3) implementing corrections for sensors presenting a drift larger than 0.05 psu and without any jump larger than 0.01 psu.

Argo Data 1999–2019: Two Million Temperature-Salinity Profiles and Subsurface Velocity Observations From a Global Array of Profiling Floats, https://www.frontiersin.org/articles/10.3389/fmars.2020.00700/full

Specific additional QC in data assembly center for OO

At Coriolis data assembly center (CMEMS TAC):

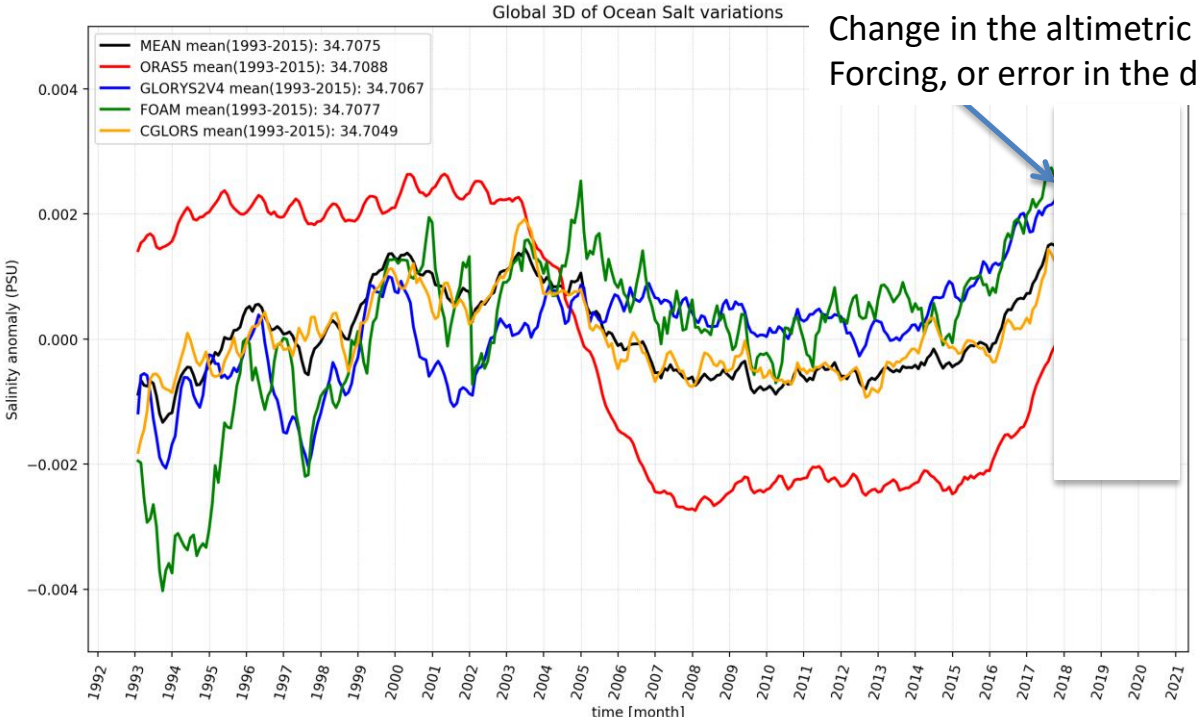
The “MinMax” QC performed at Coriolis allowing an early detection and data are flagged.
In NRT, this additional QC performed since January 2019 has allowed to detect most of the concerned platforms.
The typical amount of erroneous data is of order of 1 to 1.5 %, it did reach 4-5 % by late 2018.
This automatic QC can only detect salinity drift when that becomes “significant”.
Information is returned to Argo PI.

Both NRT and DT Coriolis in situ data sets benefit from this detection.
Ongoing work to better understand the detection efficiency of the MinMax QC for Argo salinity slow drift.
On a longer term, Coriolis will continue to improve the detection of faulty profiles.

The drift is not random, it will then create bias in gridded fields and salt content integral.
Recommandation: use the Delayed Time Argo data base for reanalysis

Gourrion J., Szekely T., Killick R, Owens B, Reverdin G, Chapron B.(2020). Improved Statistical Method for Quality Control of Hydrographic Observations. Journal Of Atmospheric And Oceanic Technology, 37(5), 789-806. Publisher's official version : https://doi.org/10.1175/JTECH-D-18-0244.1 , Open Access version : https://archimer.ifremer.fr/doc/00628/74031/

Impact on ocean analysis



Change in the altimetric data set (DT to NRT), atmos. Forcing, or error in the diag. Computation ?

Global salinity anomalies for individual GREP reanalysis and ensemble mean

We can see drift in all of those reanalysis since 2016.

- ***At which dates do those reanalysis switch from DT to NRT Argo data ?***
- discuss and agree on the sensitive/relevant diagnostic to detect salinity drift that could be due to « faulty Argo float data »: regional trend/map of *salt* content from 0 to 2000m?
- difficulty to distangle the reason of the drift without specific study…