Argo Data Management Team Meeting (ADMT-21)

2-4 December, 2020

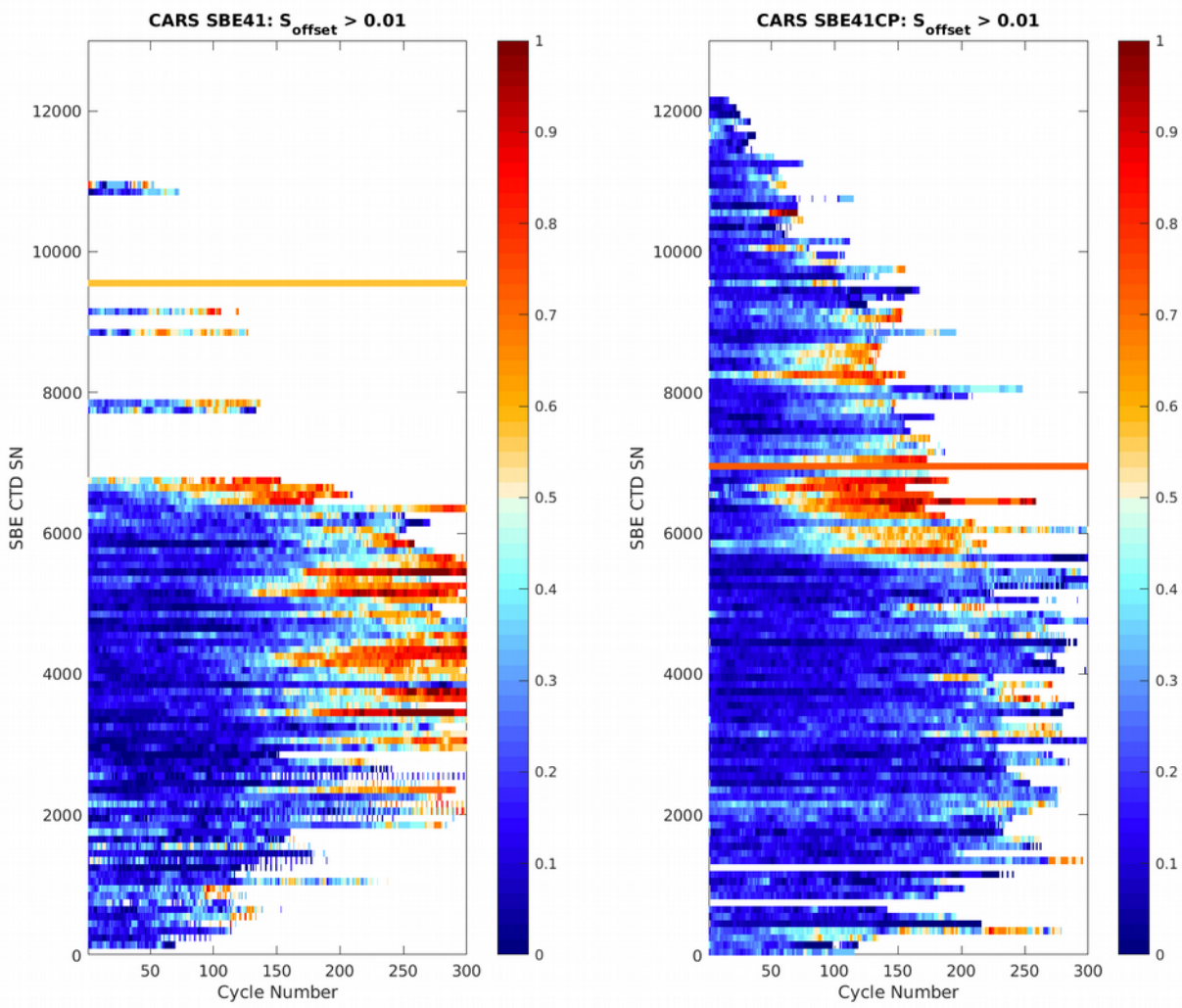
...from a computer screen near you

Action Item 47: DMQC Best Practice of Fast Salty SBE41/61 CTDs

Gilson (SIO) and the rest of the
FSD Working Group (Alkire, Bhaskar, Cabanes, Klein, Santiago, Sato, Scanderbeg, Walicka, and Wong)

SCRIPPS INSTITUTION OF OCEANOGRAPHY

Wijffels/Robbins Argo/CARS update June 2020



Fraction of assessed floats where the assessed salinity drift is greater than 0.01

ADMT20 Action Item 47

47. Form DMQC working group to create document with best practices for DMQC of high salinity drift CTDs (FSD). Present work at AST to get scientific feedback.

Recommendation #1

1) Anomalous Argo PSAL > +0.05psu should be strongly questioned and marked ‘4’ (bad) within DMQC, without solid evidence to the continued validity of the data

Recommendation #2

2) Amplitude is not the only indication of CTD sensor failure leading to flagging the data in DMQC

a) PSAL jumps of +0.01 psu
b) PSAL rate of change over several cycles
c) Strong regression back towards valid salinity values
d) Variability unexplained by the historical data

ADMT20 Action Item 47

Recommendation #3

3) The first 2 recommendations signal the failure of the CTD. However failure might not coincide with the cycle indicated by 1) and 2). Surrounding profiles should be carefully analyzed for questionable/failed data.

Recommendation #4

4) To track the impact of premature CTD failures within the Argo Program, a shared spreadsheet will be maintained listing important information on the affected floats. All DMQC groups are asked to submit their FSD information following the example of Coriolis to Birgit Klein (BSH, birgit.klein@bsh.de).

The Characteristics that qualify a float for the spreadsheet follow…

- a) SBE41(CP) sensor with CTD serial number > 6000 or any SBE61
- b) An estimated salinity adjustment of
  - i) > +0.01psu within two years of deployment
  - ii) CTD failure determined by 1), 2), or 3) above within five years of deployment

ADMT20 Action Item 47

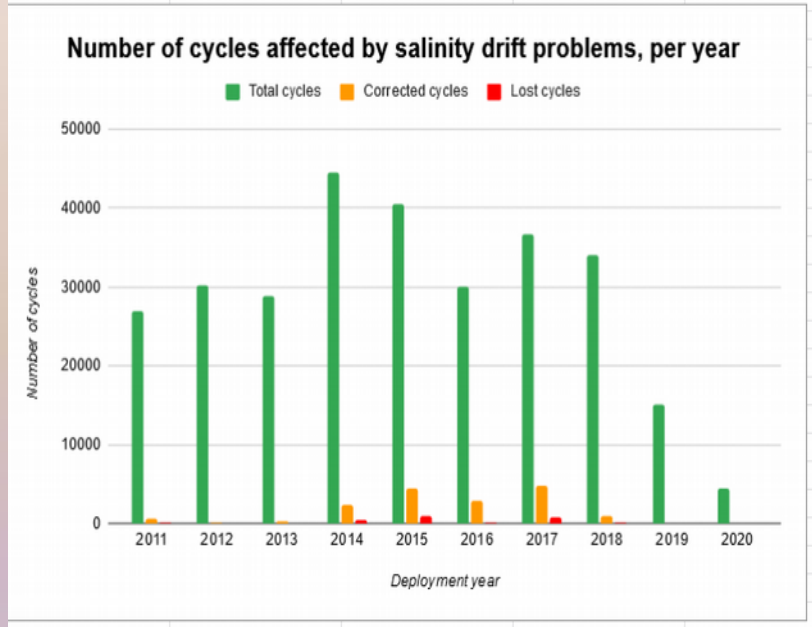
The FSD Spreadsheet (following the Coriolis precedent)

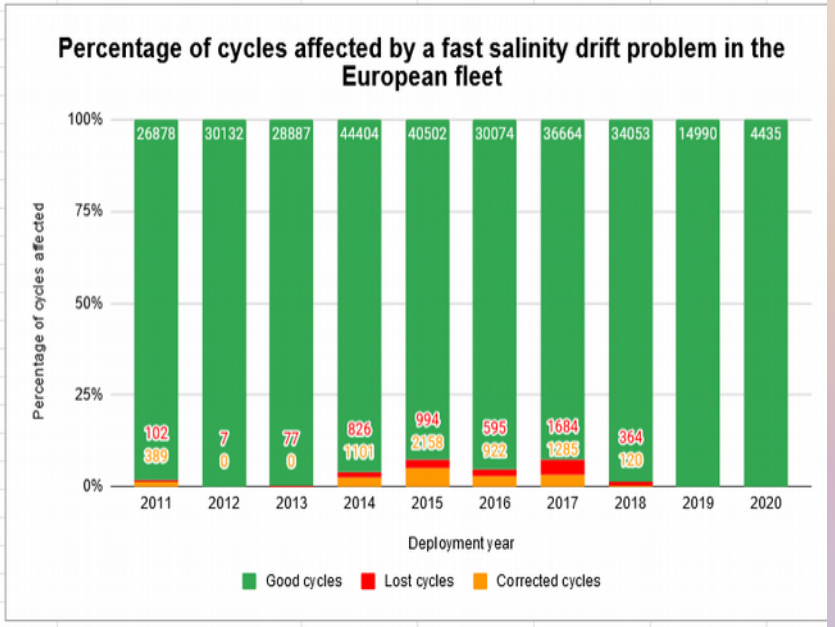
WMO_ID	Float_type	Program	Country	ACTIVE/INACTIVE	Date	Deployment year	CTD model & serial no	Is on Greylist ?	Number of existing cycle	Total cycles
1901305	APEX	BODC	UK	ACTIVE	24/03/2013	2013	41CP 5887	N/TO_ADD	256	(1-255)
1901355	APEX	BSH	Germany	INACTIVE	15/10/2012	2012	41CP 5951	dead	79	(1-79)
1901360	APEX	BSH	Germany	INACTIVE	23/06/2014	2014	41CP 6428	dead	108	(1-108)
1901362	APEX	BSH	Germany	INACTIVE	23/06/2014	2014	41CP 6430	dead	18	(1-18)
1901909	APEX	BODC	UK	ACTIVE	05/05/2018	2018	41CP 6550	N	76	(1-76)
2901096	APEX	BODC	UK	INACTIVE	31/01/2008	2008	41CP 2709	N/TO_ADD	176	(1-176)
2901102	APEX	BODC	UK	INACTIVE	08/11/2011	2011	41CP 4879	N	142	(1-142)
3901089	ARVOR	BSH	Germany	INACTIVE	27/10/2015	2015	41CP 6789	N	140	(1-139)

J	K	L	M	N	O	P	Q	R	S	
Number of existing cycle	Total cycles	Severity of drift problem (S=severe ; M=moderate)	Cycle at which malfunction started/ C1= first cycle with correction	C1= last cycle with correction	Total of corrected cycles before cycle 80th	Total of corrected cycles (sum of C1s)	C2= first uncorrectable cycle	C2= last uncorrectable cycle	Total of lost cycles (sum C2s)	
256	(1-255)	S			0	0	58	255	197	DMQC at 08.04.2020: Profile 1-
79	(1-79)	S			0	0	72	79	7	DMQC at 24.09.2018: Fast salt
108	(1-108)	M	48	108	32	60			0	DMQC at 15.07.2018: Stronger
18	(1-18)	S	1	18	17	17			0	DMQC at 15.06.2017: Early dea
76	(1-76)	M	1	76	75	75			0	DMQC at 19.06.2020 : Profiles
176	(1-176)	S	29	100	51	71	101	176	75	DMQC at 25.09.2020: Profile 1-
142	(1-142)	M	60	142	20	82			0	DMQC at 25.09.2020: Profile 1-

ADMT20 Action Item 47

Example of impact of FSD on the European fleet using the present spreadsheet





ADMT20 Action Item 47

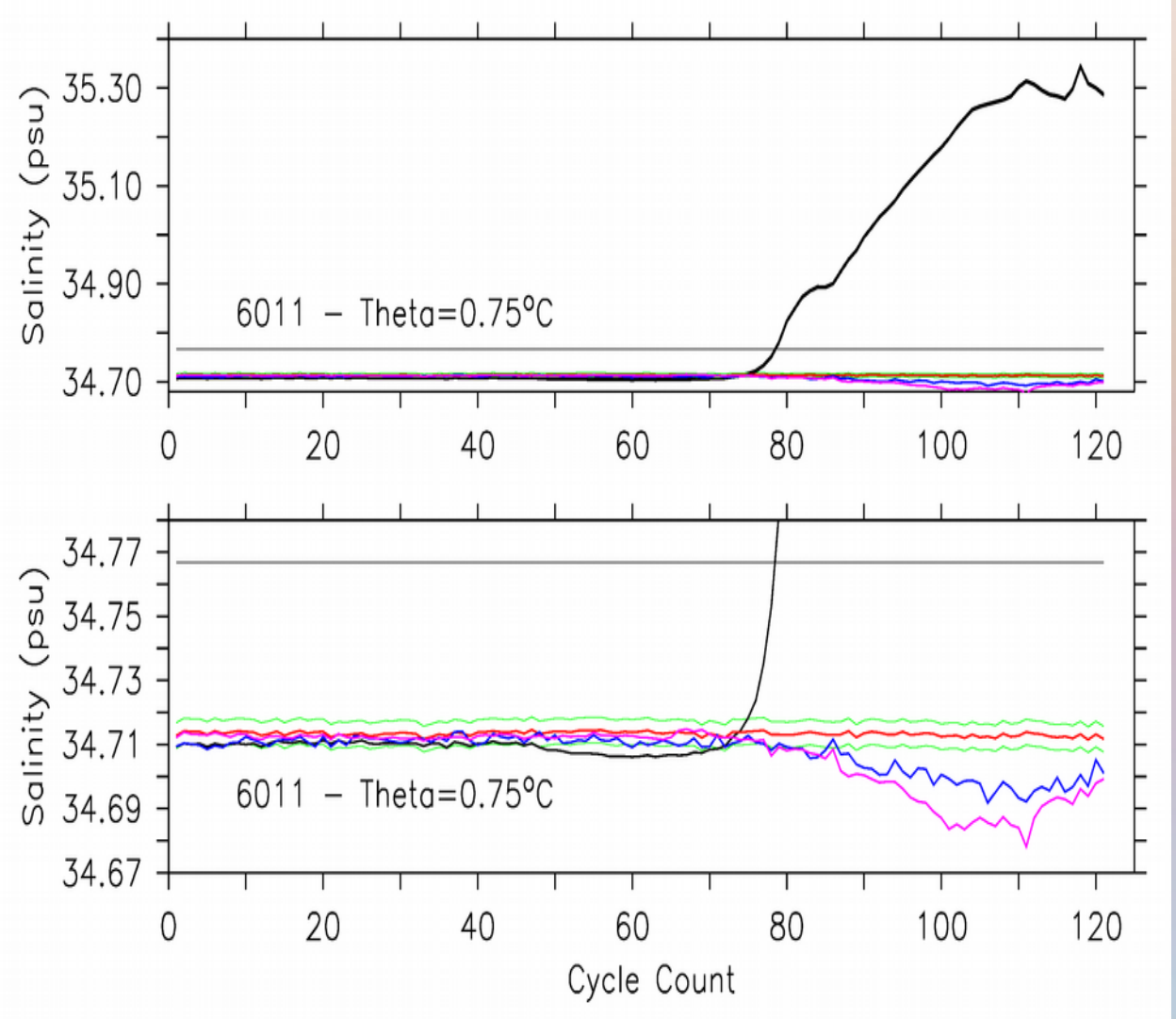
….The End

Stay Safe and Healthy!

ADMT20 Action Item 47: Depth Dependence

A Deep Argo WMO 5902448)

Thick Black: Raw salinity on the 0.75°C isotherm

No OWC model used. Each cycle corrected indv.

Red: OWC correction using deepest pressure levels (4000-6000dbar)
Blue: OWC correction using 3000-4000dbar
Magenta: OWC correction using 2000-3000dbar