



Coriolis

OPERATIONAL OCEANOGRAPHY

Status of Anomalies at GDAC

C. COATANOAN

with the Coriolis operators

Stages in the anomaly detection procedure

- In real time

Objective analysis (based on too old climatology with too strict standard deviations giving too much false detections; need adjustments)

Adaptation of the minmax method to operational control (enlargement of the thresholds to achieve a good compromise of good and bad alerts, dedicated tools to manage those thresholds for the near real-time (especially for marginal seas)).

→ Minmax efficiency to raise suspicions for early salinity drift

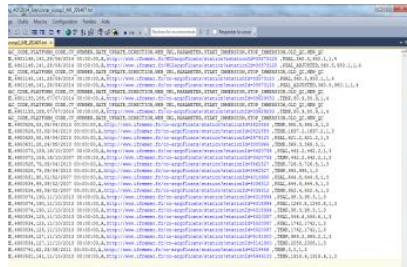
- In delayed mode

CORA

Complementary studies (Spike test, drift study for each DAC, improvement on minmax thresholds from delayed mode data)

SINCE LAST ADMT – CHANGES (REPORT, LIST OF ANOMALIES)

ADMT-21 - December 2020 Visio



Message - QC changes To DAC operators

ftp site
<ftp://ftp.ifremer.fr/ifremer/argo/etc/ObjectiveAnalysisWarning>



Monthly report
To argo-dm / argo-dm-dm



Re-organization of the report:

- Priority to doubtful behaviors of floats : table with comments (drift, ...)
- The first table has been slightly reorganized to highlight the new floats for which drift has been detected. The others are left under the banner "Previous reports" and indicate those still detected by the anomalies (not yet in grey list). At the end, two new categories
 - one to indicate the floats for which the DAC operators do not agree although these floats still appear in the anomalies.
 - a second to indicate the floats that have been present in the table in the previous month and that have been put in grey list.
- Link to the ftp site to get access to the messages sent to DAC operators (only list of floats with detected anomalies)

FLOATS WITH SUSPECTED DRIFT (TABLE IN REPORT)

Following the problem detected on some specific serial numbers of sensor model, a careful analysis of the floats is performed as soon as the salinity behaviour shows a suspicious drift.

ADMT20 - Action 13. Ask DACs to put floats that fail MinMax test for drift on the greylist. Information for this is found in monthly report from Coriolis in first chart. Start cycle and QC flag suggestion are included in the report. DACs should do this automatically

➔ Not the case for some PIs, put float on grey list decrease time to spend on floats warning by the MinMax method.

DAC	WMO	PI	Description	First station in alert	First cycle in alert	Last Station in alert	Last cycle in alert	SENSOR_MODEL	SERIAL_NU	Failure_Type for Coriolis DB (1-drift, 2-bias, 3-weird, 4-wrecked, 5-pressure, 6-adjustment issue)	Comment All drift mentions are SUSPICION drift value mentions are visual impression surrounding profiles = close in space (position diff < 2 degrees latitude/longitude) and in time (date diff < 5 years)
NEW											
AOML	3901114	BRECK OWENS, STEVEN JAYNE, P.E. ROBBINS	Argo WHOI	2020/10/06	191	2020/10/25	193	SBE41CP	6466	1	Drift
AOML	3901803	DEAN ROEMMICH	Argo SIO	2020/10/02	81	2020/10/22	83	SBE41CP_V7.2.5	10690	1	Slight jump and drift
AOML	3901809	BRECK OWENS, STEVEN JAYNE, P.E. ROBBINS	Argo WHOI	2020/10/25	271	2020/10/30	272	SBE41CP	8451	1	Slight jump and drift
AOML	3902164	BRECK OWENS, STEVEN JAYNE, P.E. ROBBINS	Argo WHOI	2020/10/22	59	2020/10/22	59	SBE41CP	11027	1	Slight jump and drift
AOML	4902313	GREGORY C. JOHNSON	Argo PMEL	2020/10/26	163	2020/10/26	163	SBE41CP	7547	1	Slight drift
CORIOLIS	3901903	Sabrina Speich	ARGO MOCCA - EU	2020/10/28	142	2020/10/28	142	SBE41CP_V7.2.5	8272	1	Drift
CORIOLIS	3901919	Sabrina Speich	ARGO MOCCA - EU	2020/10/14	142	2020/10/24	143	SBE41CP_V7.2.5	8303	1	Big jump, one cycle, wait for other cycles
CORIOLIS	3901937	Sabrina Speich	ARGO MOCCA - EU	2020/10/02	137	2020/10/22	139	SBE41CP_V7.2.5	8505	1	Drift, bias ? Wait for other cycles
CORIOLIS	6902762	Bernard BOURLES	CORIOLIS - PIRATA	2020/09/22	128	2020/10/22	131	SBE41CP_V7.2.5	8504	1	Slight drift, to checked
CORIOLIS	6902779	Sabrina Speich	CORIOLIS	2020/10/27	100	2020/10/27	100	SBE41CP_V7.2.5	8974	1	Slight drift, to checked
CORIOLIS	6902797	Christine COATANOAN	CORIOLIS	2020/10/07	53	2020/10/27	55	SBE41CP_V7.2.5	9082	1	Drift, bias ? Wait for other cycles
CORIOLIS	6902922	Sophie CRAVATTE	CORIOLIS	2020/09/23	58	2020/10/23	61	SBE41CP_V7.2.5	10768	1	Drift, bias ? Wait for other cycles
CORIOLIS	6903014	Franck DUMAS -> Grey List	CORIOLIS	2020/10/14	1	2020/10/27	12	SBE41CP_V7.2.5	11691	3	Big jump ? Problem during launch of the float
CORIOLIS	6903562	Kjell Arne Mork	Argo NORWAY	2020/09/16	48	2020/10/26	52	SBE41CP_V7.2.5	10941	1	Drift
CORIOLIS	6903574	Kjell Arne Mork	Argo NORWAY	2020/10/10	11	2020/10/20	13	SBE41CP	12716	2	Big jump
CSIO	2902622	ZENCHONG LIU	Argo CHINA	2020/10/23	220	2020/10/23	220	SBE41CP	5614	1	Drift
CSIRO	5903701	Susan Wijffels -> Grey List	Argo AUSTRALIA	2020/07/27	321	2020/10/15	329	SBE41_V3	5564	1	Slight drift
PREVIOUS REPORTS											
AOML	1901805	GREGORY C. JOHNSON	Argo PMEL	2020/07/28	135	2020/10/06	142	SBE41CP	8181	1	Adjustment on PSAL_ADJUSTED is going to introduced a bias
AOML	1901812	BRECK OWENS, STEVEN JAYNE, P.E. ROBBINS	Argo WHOI	2020/02/17	148	2020/08/05	169	SBE41CP	7205	3	Very weird behaviour, that may be depth-dependant. Cycle 148 is definitely out of distribution (0.08 psu saltier) but only at depth.
AOML	1902057	GREGORY C. JOHNSON	Argo PMEL	2019/10/03	105	2020/04/20	125	SBE41CP	8465	1	cycle 84 is 0.1 PSU saltier than platform's other profiles and surrounding profiles. cycle 101 is 0.3 PSU saltier.
AOML	1902198	GREGORY C. JOHNSON	Argo PMEL	2020/02/20	61	2020/10/27	86	SBE41CP	9911	1	cycle 53 is 0.05 psu saltier than surrounding profiles.
AOML	1902199	GREGORY C. JOHNSON	Argo PMEL	2020/03/05	54	2020/07/03	66	SBE41CP	9841	2	big fresh jump in salinity. cycle 35 is 1.5 PSU fresher
AOML	2902397	BRECK OWENS, STEVEN JAYNE, P.E. ROBBINS	Argo WHOI	2020/05/16	167	2020/10/28	184	SBE41CP	7335	1	Gap around 3 psu
AOML	3902290	CTDPHFN DIFCO	Argo FNU	2020/04/21	408	2020/09/05	411	SBE41	1044	1	Small drift which causes some back to correct profiles with cycle 413

FLOATS WITH SUSPECTED DRIFT (TABLE IN REPORT)

Please consult this report and proceed in priority with the DMQC on these floats without forgetting to ask the DACs to put them in the grey list.

Please also refer to the other procedures highlighting anomalies (see the website for links to the lists of problem floats).

ADMT-21 - December 2020 Visio

Argo

HOME ACCESS TO DATA DATA MGT TEAM DOCUMENTATION **DMQC** MONITORING AT GDAC ARGO REGIONAL CENTERS

Tools for DMQC

What float should I process first?

Mentors for Argo CTD

Reference data base

Known issues

What float should I process first?

The Argo community is periodically performing analysis to identify which floats need to be process first in DMQC as anomalies are suspected

The following information are available :

- > WHOI analysis to detect possible drift : http://argo.whoi.edu/argo/sbedrift_wmo/
- > Check against altimetry : <ftp://ftp.ifremer.fr/ifremer/argo/etc/argo-ast9-item13-AltimeterComparison/>
- > Check at Coriolis using Argo MinMax climatology tests are available in monthly Coriolis GDAC reports : ftp://ftp.ifremer.fr/ifremer/argo/etc/Report_ObjectiveAnalysisWarning/
- > DM consistency checks in the North Atlantic: <http://www.umr-lops.fr/en/SNO-Argo/Activities/NAARC/Consistency-checks-of-DM-salinity-corrections>

ALERTS

MESSAGE TO ARGO
USERS ABOUT AN

<http://www.argodatamgt.org/DMQC/What-float-should-I-process-first>

NEED TO UPGRADE THE MESSAGE ? REQUEST FROM SOME DACS

**Just to remind the minor changes in the message
since july 2019**

DAC_CODE,PLATFORM_CODE,CV_NUMBER,DATE_UPDATE,DIRECTION,WEB_URL,PARAMETER,START_IM
MERSION,STOP_IMMERSION,OLD_QC,NEW_QC,**VERTICAL_SAMPLING_SCHEME**
AO,4902104,67,30/07/2017 00:00:00,A,<http://www.ifremer.fr/co-argoFloats/station?stationId=53054408>
,PSAL,1.16,2011.6,1,3,**Primary sampling**

=> Add N_PROF
=> Add LEVEL_IMMERSION

Why N_PROF ? [PROFILE_NUMBER]

- N_PROF used in the NetCDF Files.
The indication 'Vertical sampling scheme' is not enough when 2 near-surface sampling exist for a same cycle.
Use the information archived in Metadata file as PROFILE_NUMBER.

Why LEVEL_IMMERSION ? [START_IMMLEVEL,STOP_IMMLEVEL]

- Level of the correction : 'imm_level' because the pressure data can also be duplicated or in error, then it is not so easy for an automated processing to find the right measurement.

DAC_CODE,PLATFORM_CODE,CV_NUMBER,DATE_UPDATE,DIRECTION,WEB_URL,PARAMETER,START_IMMERSION,STOP
_IMMERSION,OLD_QC,NEW_QC,**VERTICAL_SAMPLING_SCHEME**,**START_IMMLEVEL**,**STOP_IMMLEVEL**,**PROFILE_NUMBER**
AO,4900573,85,12/08/2019 00:00:00,A,<http://www.ifremer.fr/co-argoFloats/station?stationId=3813716>
,TEMP,1770,1770,1,4,**Primary sampling**,53,53,1

MESSAGES

- Message to DACs (generic address – operator address)

AOML	aoml.argo@noaa.gov
BODC	argo@bodc.ac.uk
CORIOLIS	codac@ifremer.fr / Thierry.Carval@ifremer.fr / Christine.Coatanoan@ifremer.fr
CSIO	liuzenghong@139.com
CSIRO	Jenny.Lovell@csiro.au / rebecca.cowley@csiro.au / catriona.johnson@csiro.au / Gabriela.Semolinipilo@csiro.au
INCOIS	argo@incois.gov.in / uday@incois.gov.in
JMA	argoadmin@climar.kishou.go.jp
KMA	phchang@korea.kr / jsp98@korea.kr / hjjo543@korea.kr / krkang@kma.go.kr
KIOST	sdkim@kiost.ac.kr / hyukmin@kiost.ac.kr
MEDS	ARGO-Canada@dfo-mpo.gc.ca
NMDIS	yupoyuhun@163.com

- Message also available on Coriolis ftp site

<ftp://ftp.ifremer.fr/ifremer/argo/etc/ObjectiveAnalysisWarning/>

- Monthly report

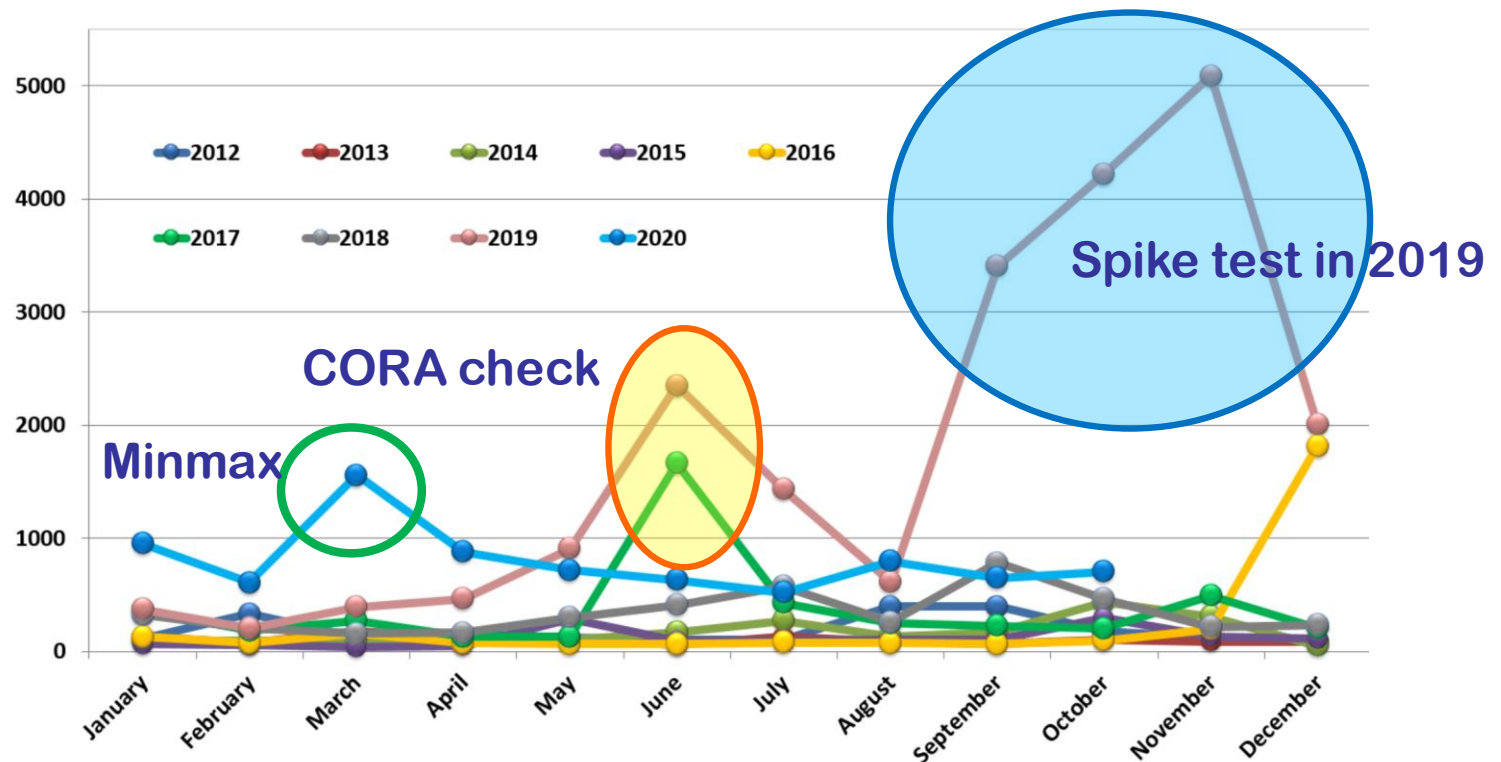
- argo-dm@jcommops.org & argo-dm-dm@jcommops.org
- on Coriolis ftp site

ftp://ftp.ifremer.fr/ifremer/argo/etc/Report_ObjectiveAnalysisWarning/

NUMBER OF ANOMALIES BY YEAR, BY MONTH

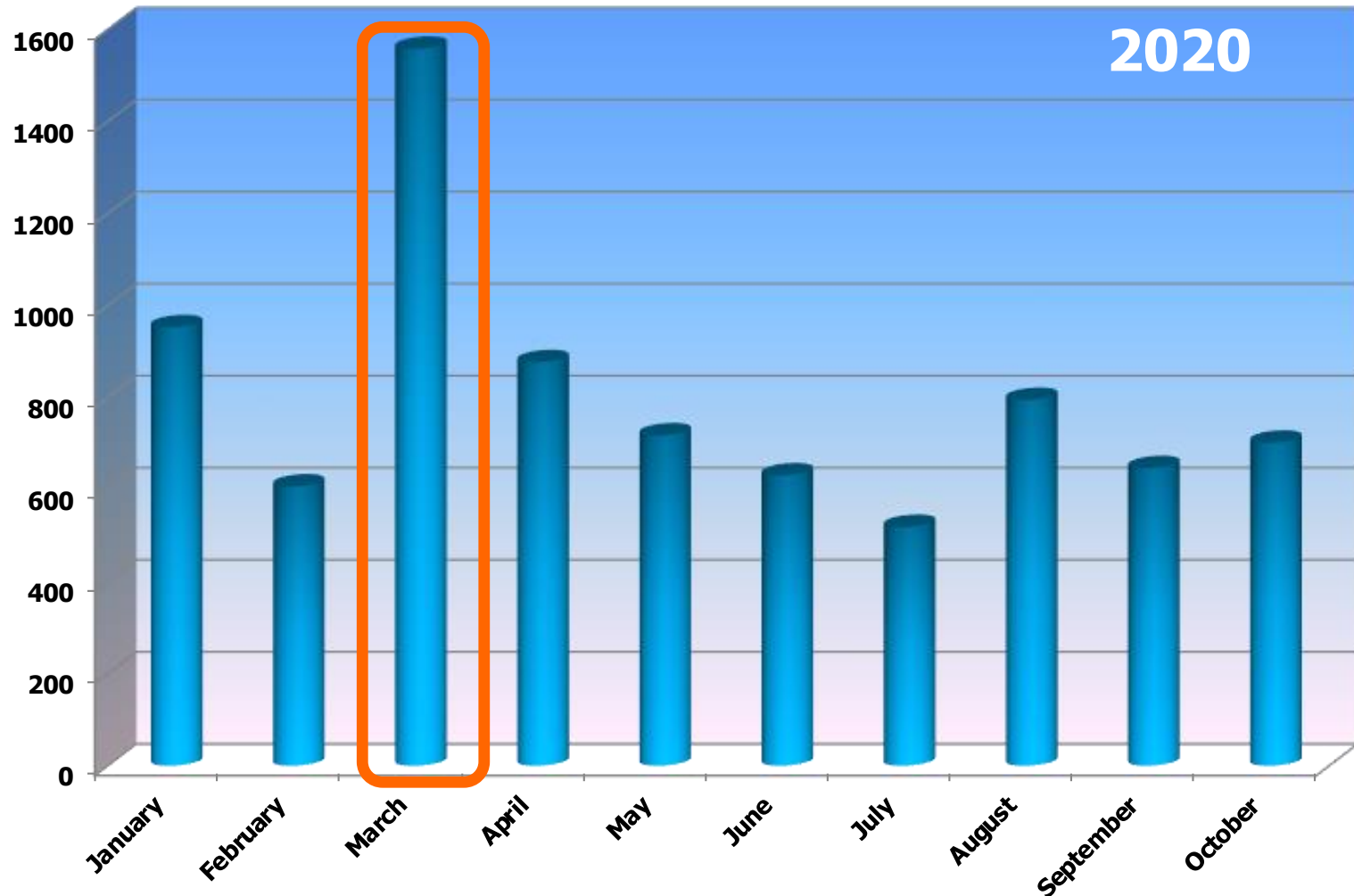
Regular and Special events on profile QC which can explain increase of anomaly number

- 'DM Analysis' checks for the CORA dataset [May-June-July 2019 – peak in June]
- Process of the new spike test (test performed on raw parameter for DM files first and RT second, providing many anomalies on DM/RT profiles) [September[DM/RT]/October-November[RT] 2019]



ANOMALIES MONITORING

Anomalies by month, from all DACs

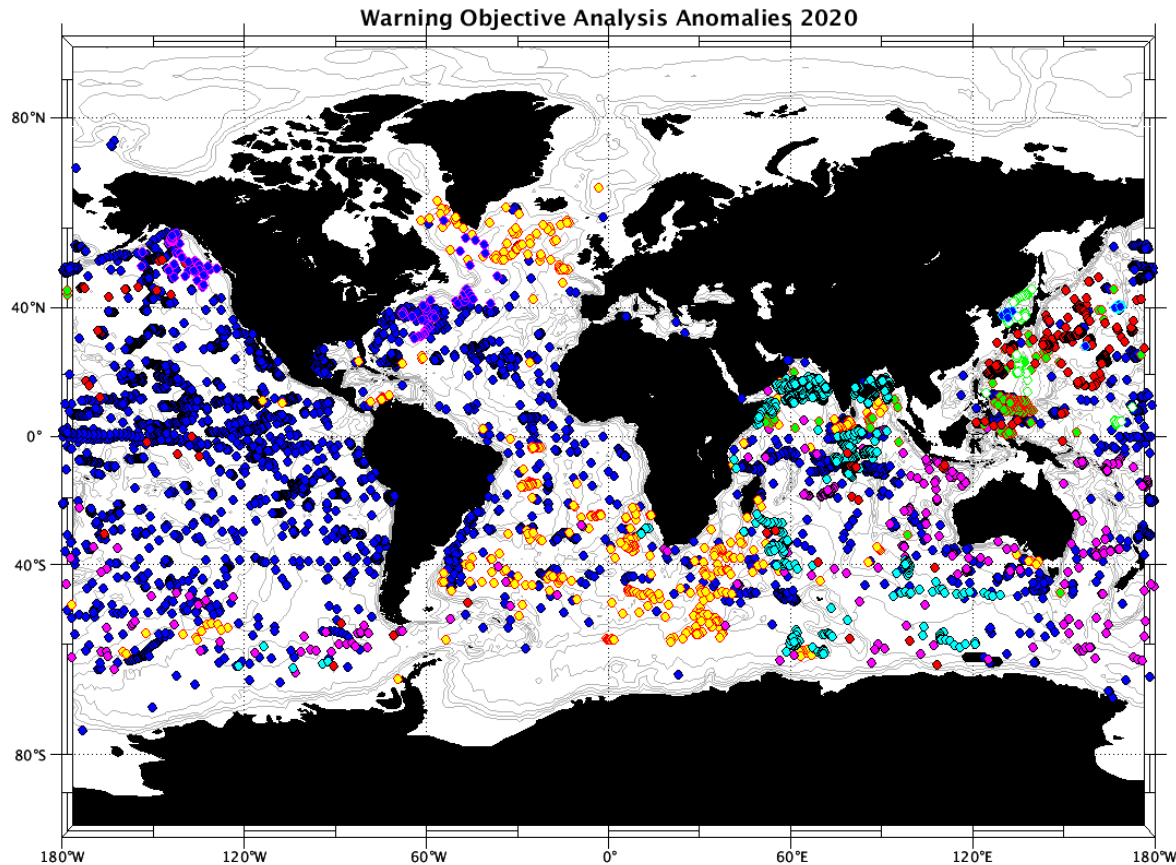


Specific work with minmax (test on new release V4)

ANOMALIES MONITORING

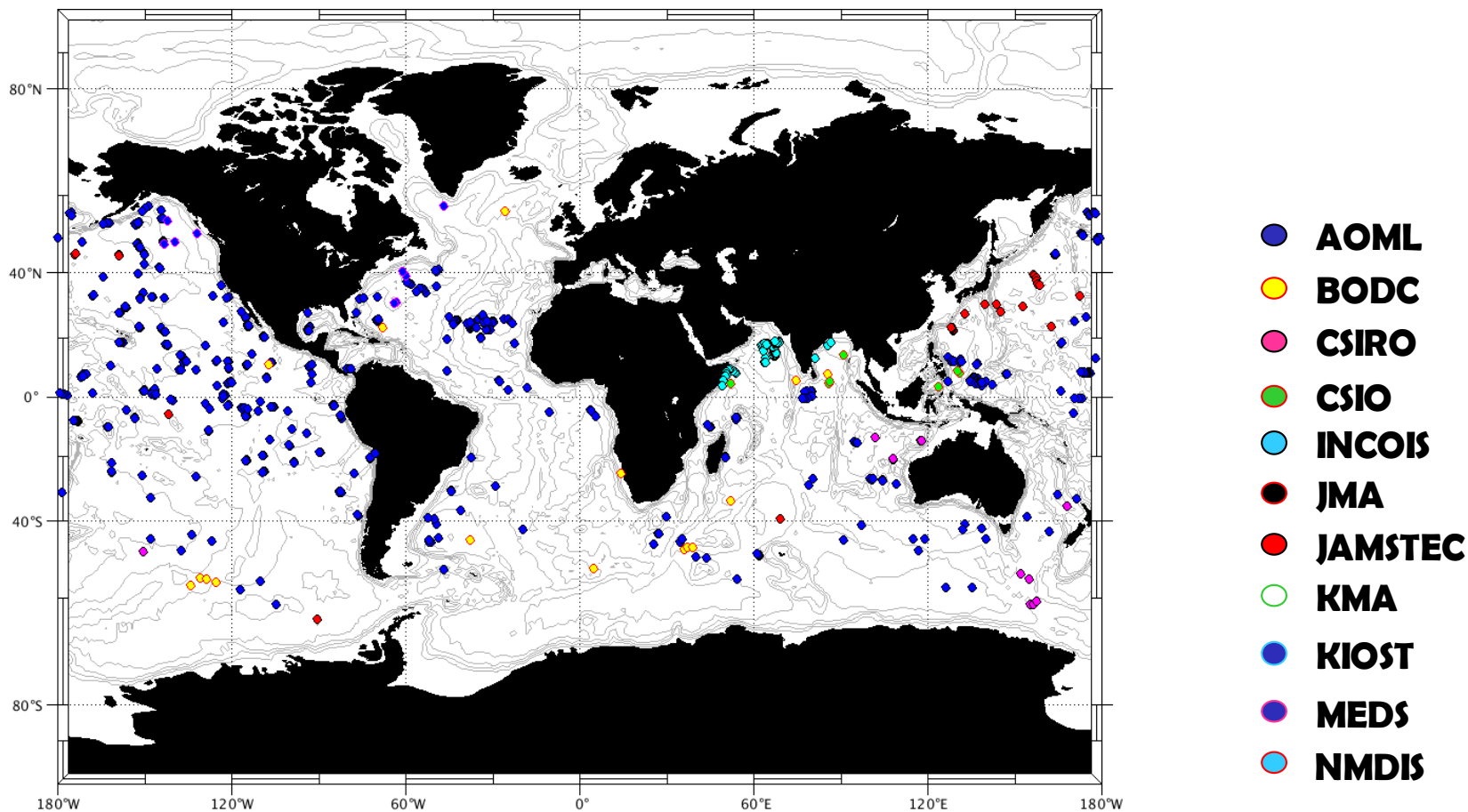
YEAR 2020 : 1st January to 23th November

ADMT-21 - December 2020 Visio

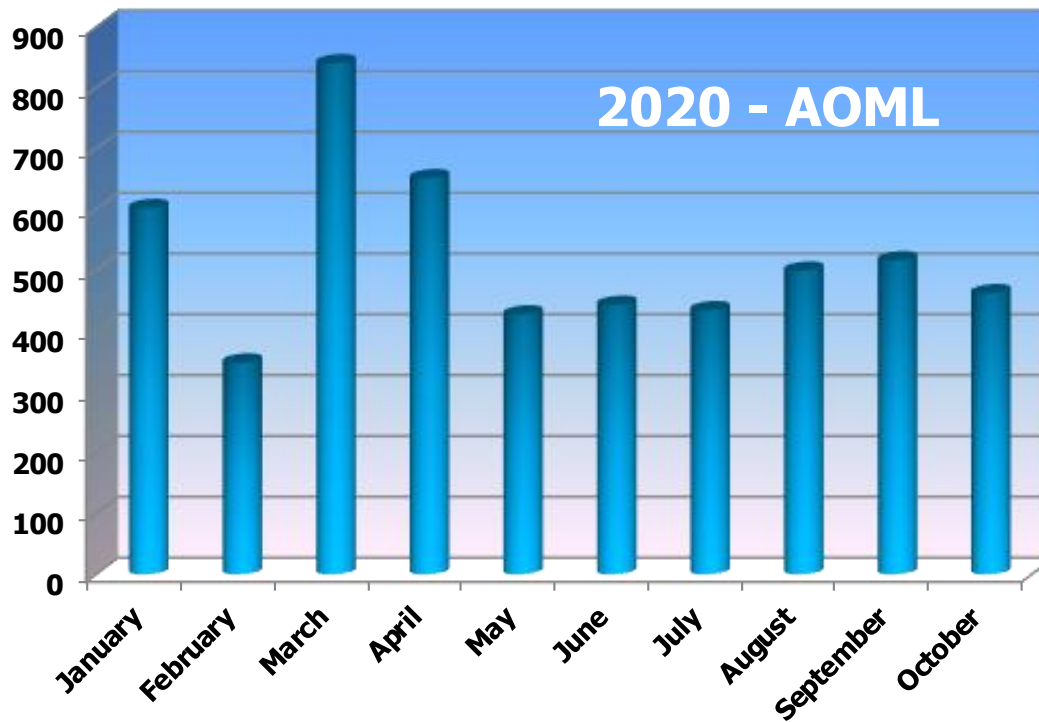
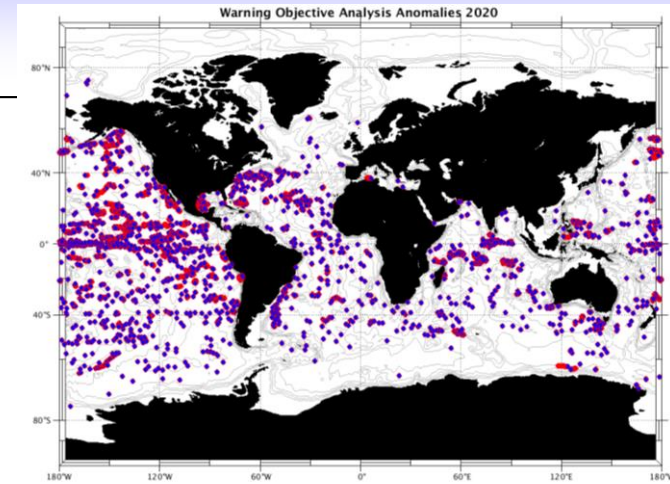


- AOML
- BODC
- CSIRO
- CSIO
- INCOIS
- JMA
- JAMSTEC
- KMA
- KIOST
- MEDS
- NMDIS

Focus on last month : October 2020



AOML profiles requiring corrections



Feedback:
From Claudia

ANOMALIES MONITORING



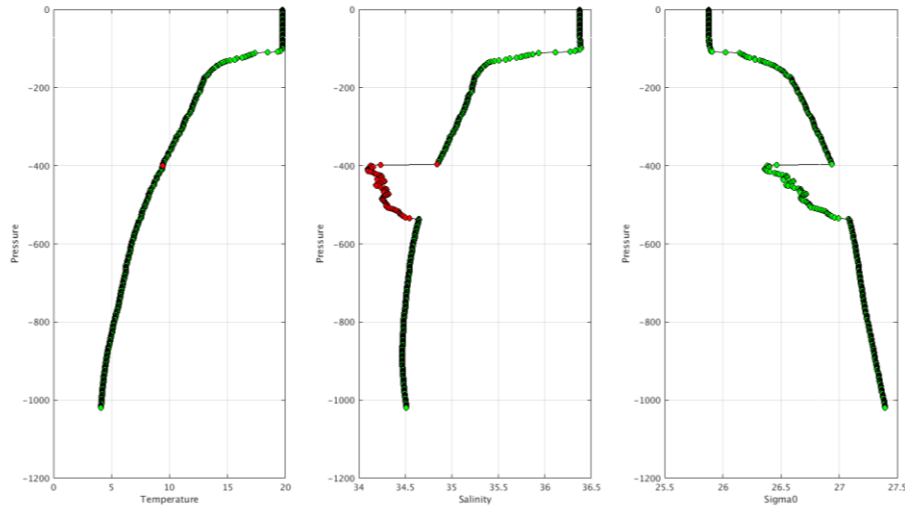
QC=4 BAD



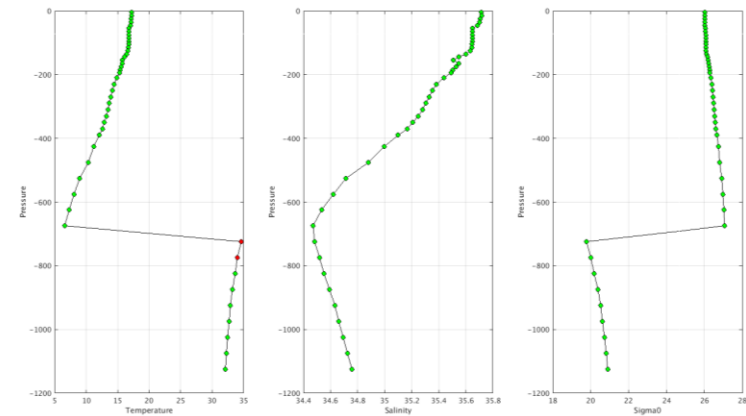
QC=1 GOOD

ADMT-21 - December 2020 Visio

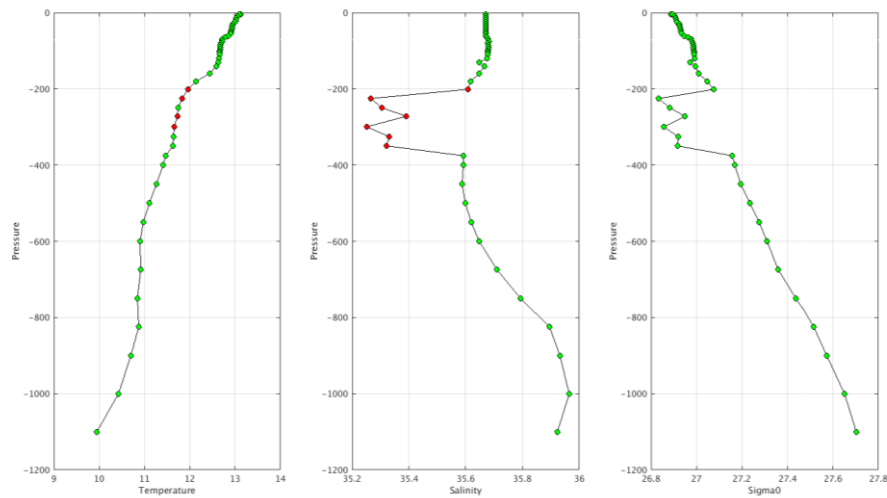
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC AO- Float 1901719 - 237



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC AO- Float 1900203 - 50



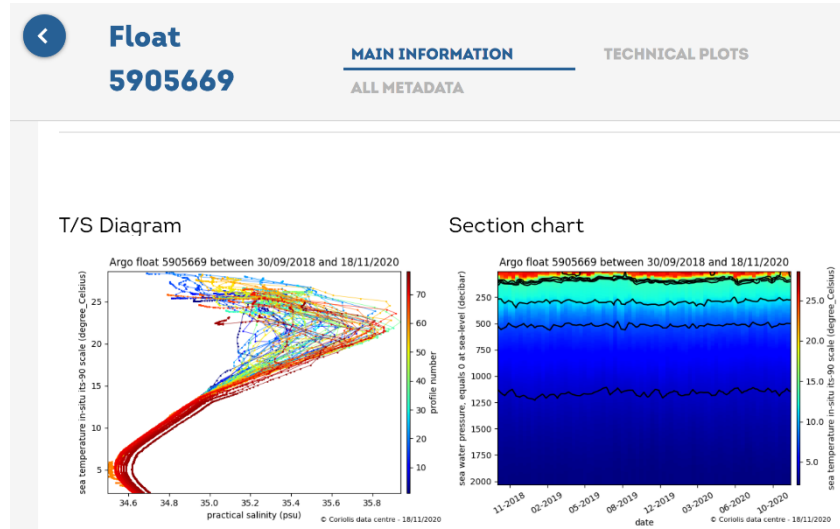
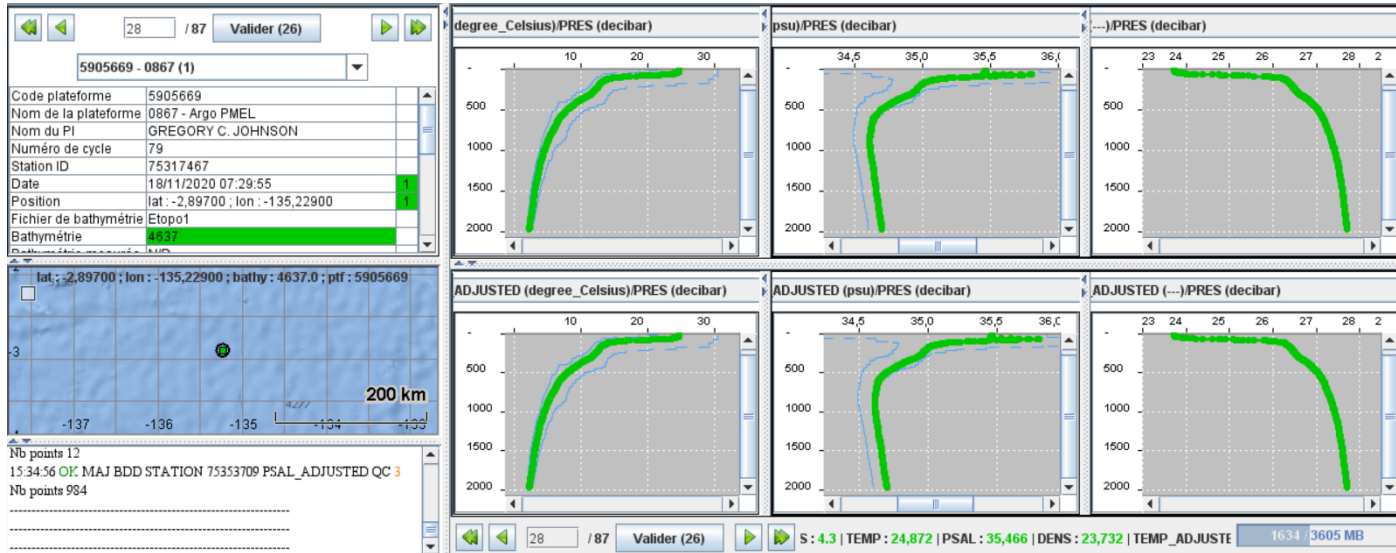
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC AO- Float 1901520 - 134



ANOMALIES MONITORING

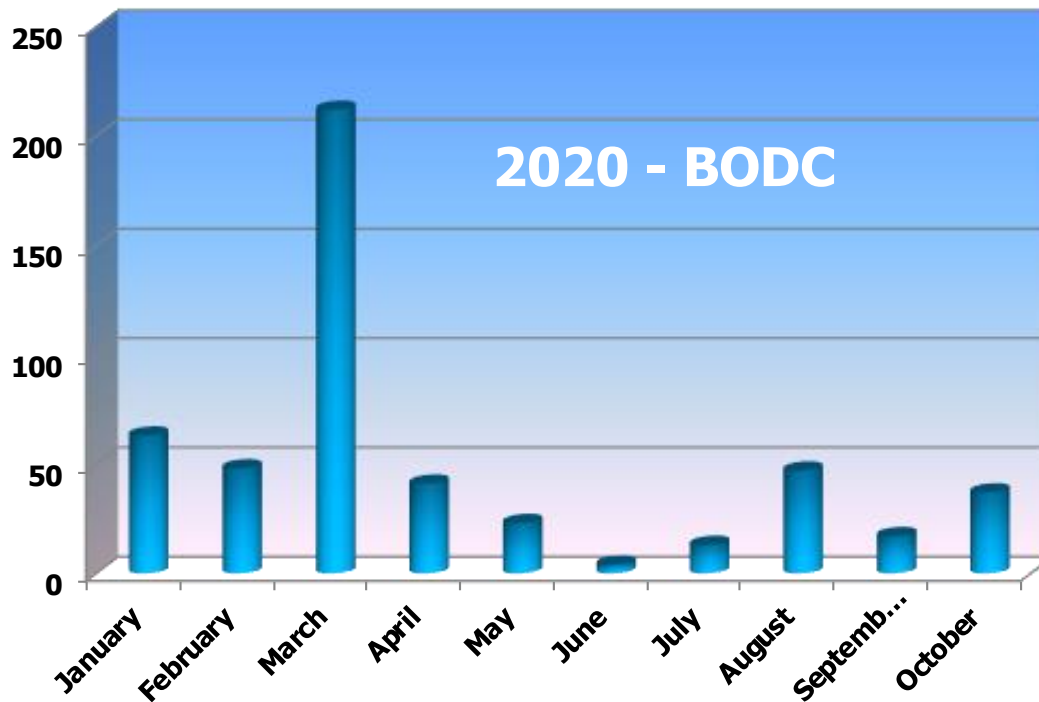
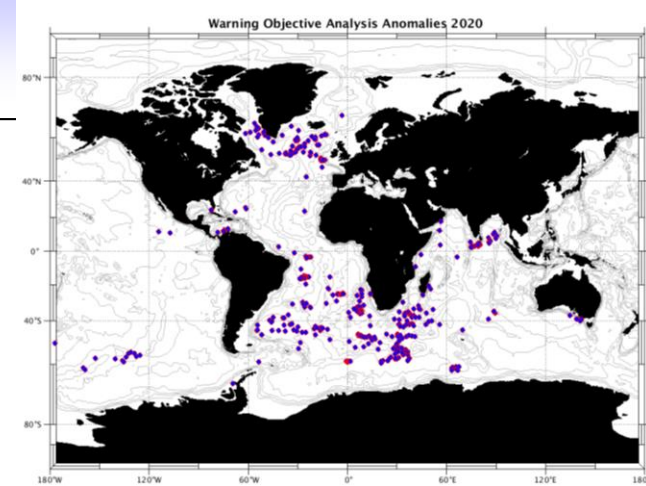
Still FLOATS WITH DRIFT WHICH CAN BE ON GREY LIST

ADMT-21 - December 2020 Visio



ANOMALIES MONITORING

BODC anomalies profiles requiring corrections



Feedback:
From Matthew Donnelly

ANOMALIES MONITORING



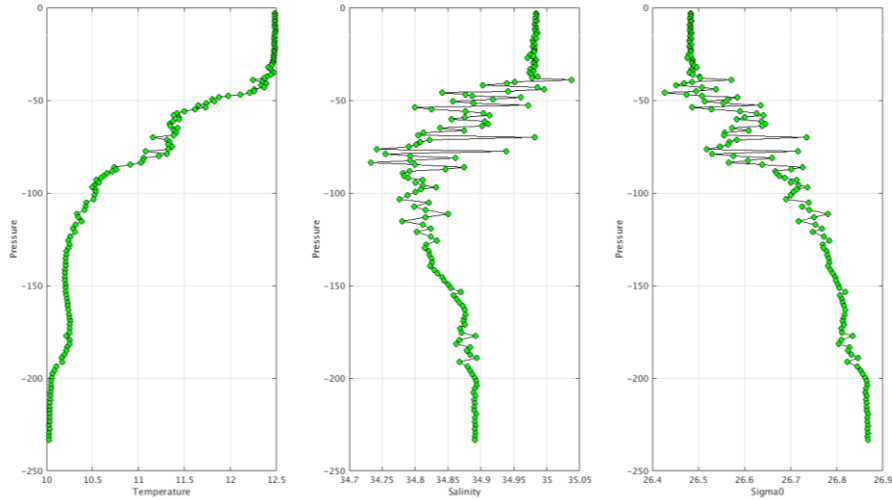
QC=4 BAD



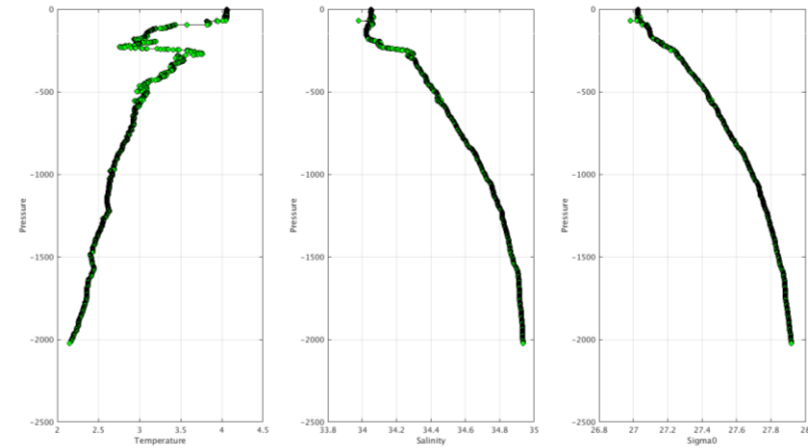
QC=1 GOOD

ADMT-21 - December 2020 Visio

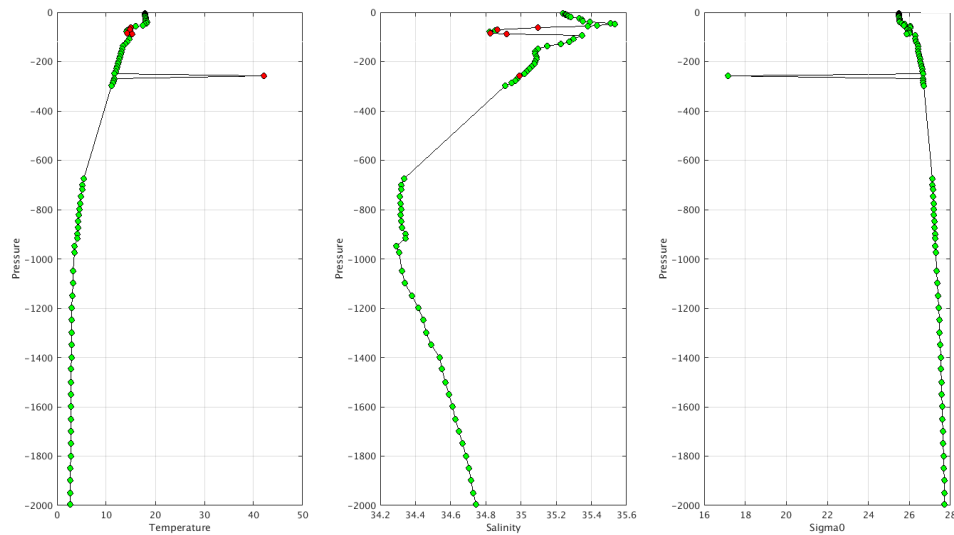
Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC BO- Float 3901965 - 147



Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC BO- Float 3901885 - 139



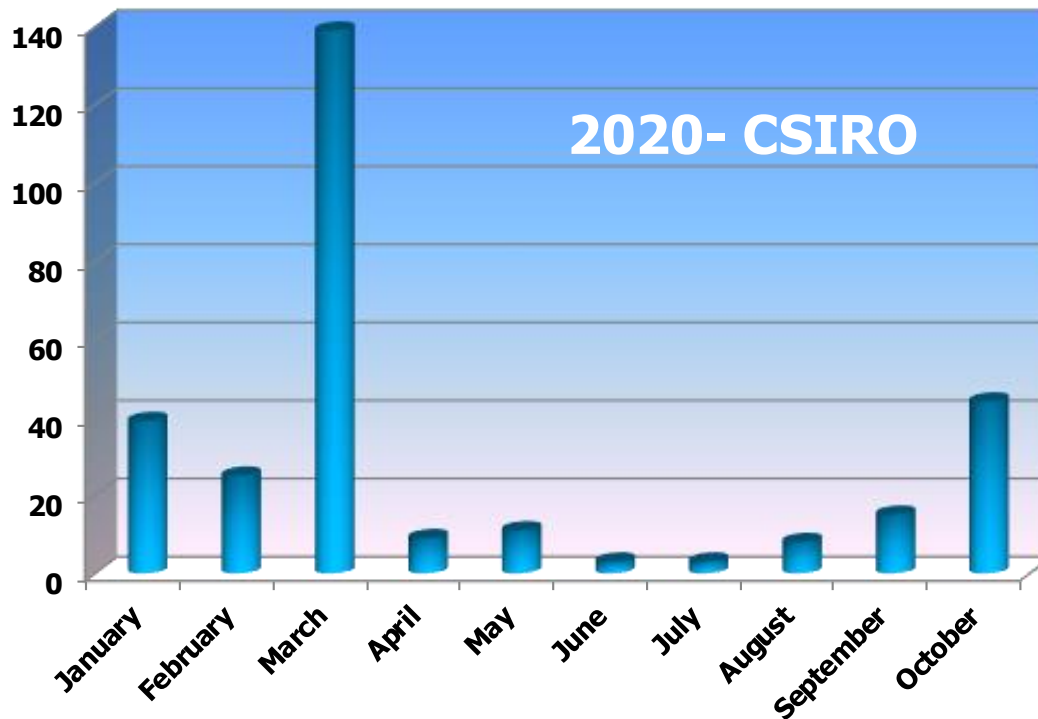
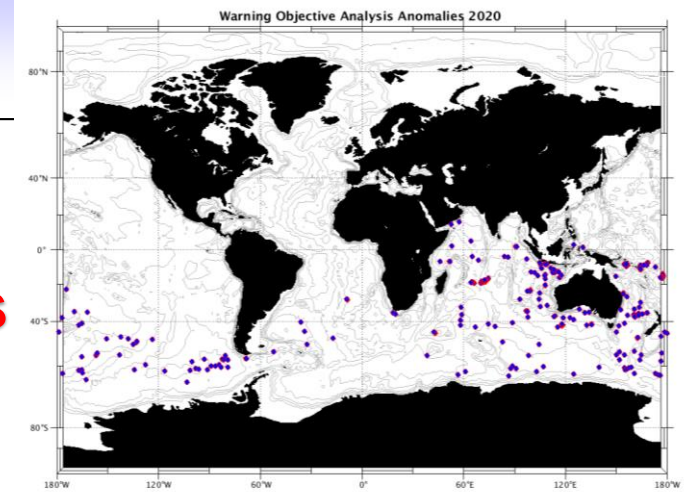
Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC BO- Float 3901546 - 52



Coriolis

ANOMALIES MONITORING

CSIRO anomalies profiles requiring corrections



Feedback:
From Jenny Lovell
Catriona Johnson
Rebecca Cowley

ANOMALIES MONITORING



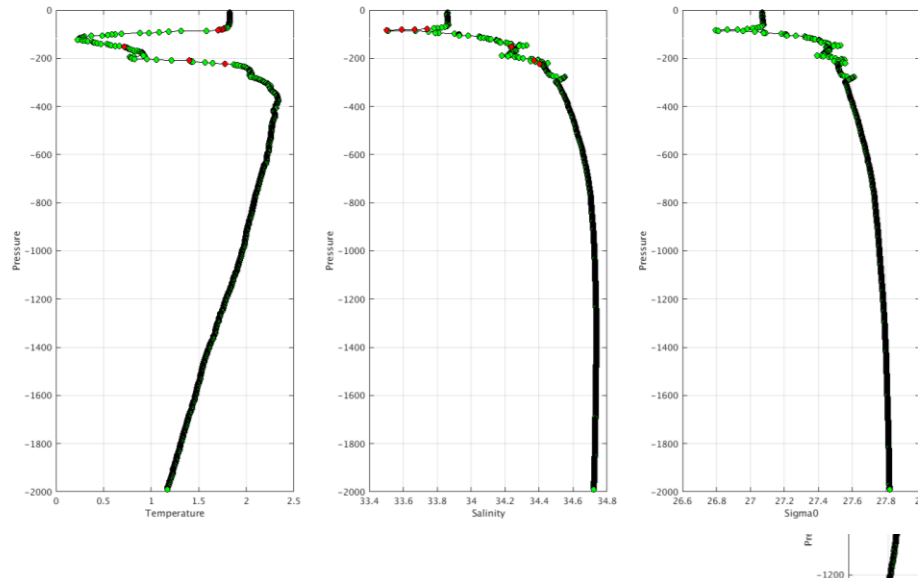
QC=4 BAD



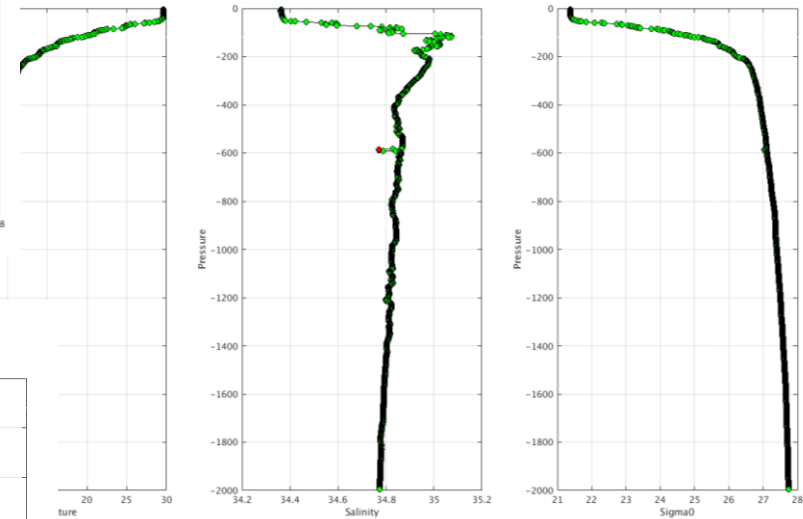
QC=1 GOOD

ADMT-21 - December 2020 Visio

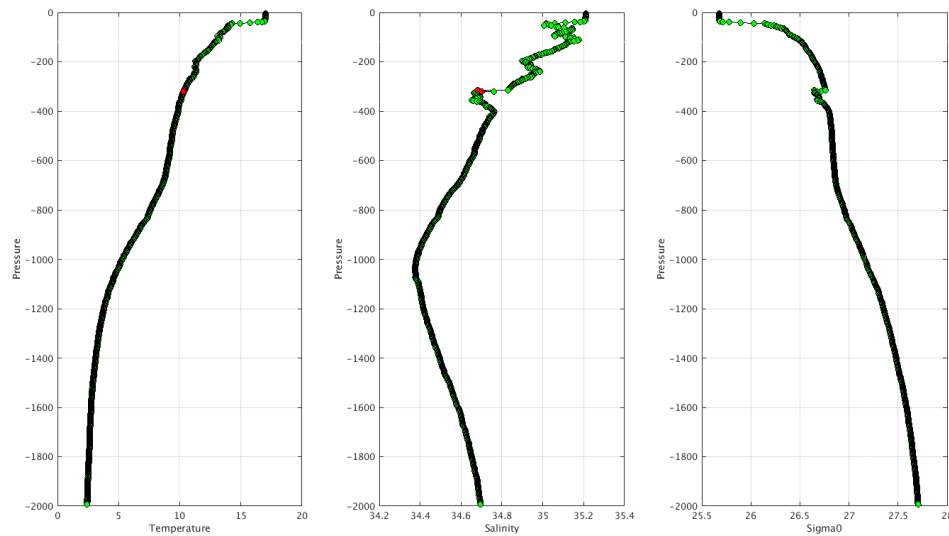
Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC CS- Float 5905394 - 85



Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC CS- Float 1901331 - 244



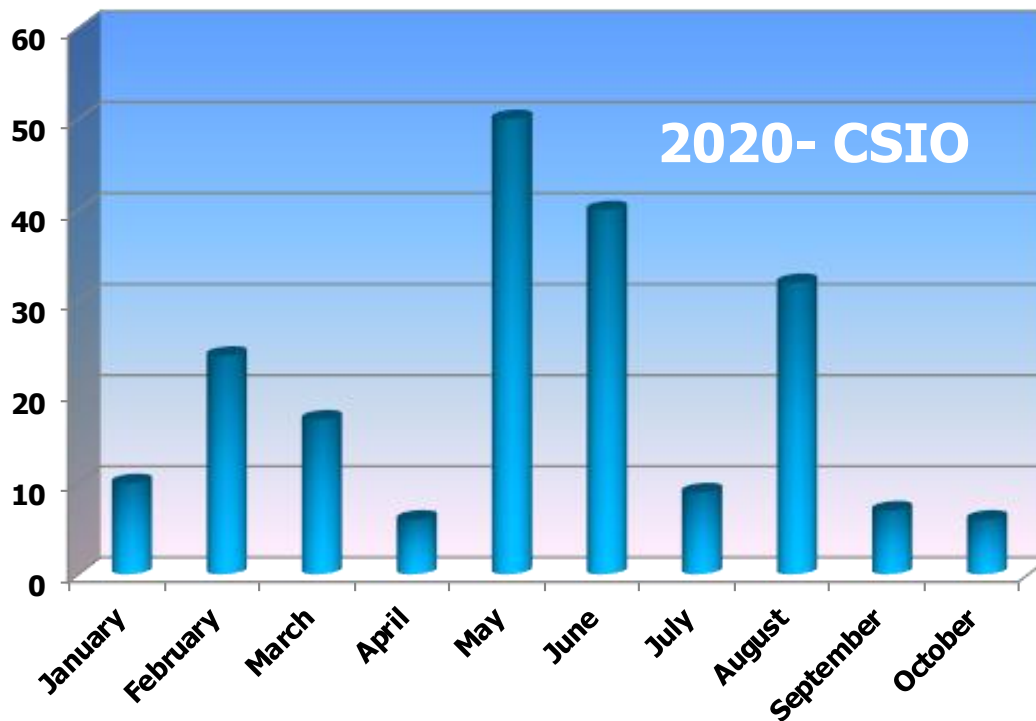
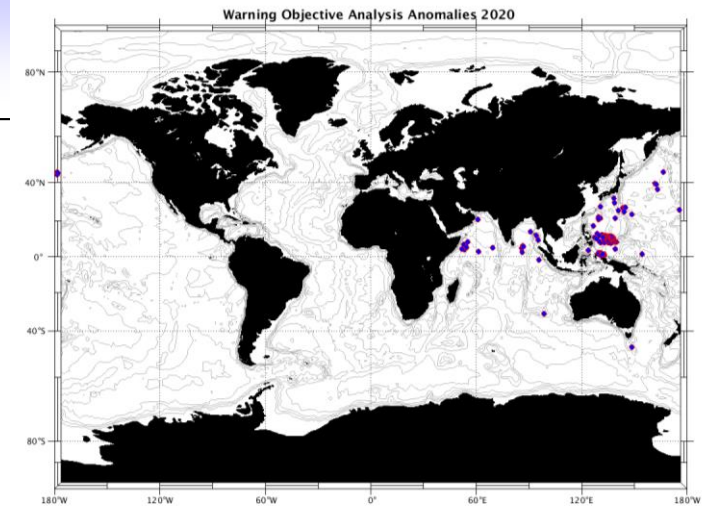
Warning Objective Analysis Anomalies 2020 October TEMP PSAL: DAC CS- Float 5904890 - 196



Coriolis

ANOMALIES MONITORING

CSIO anomalies profiles requiring corrections



Feedback:
From Liu Zenghong

RTQC PROCEDURES

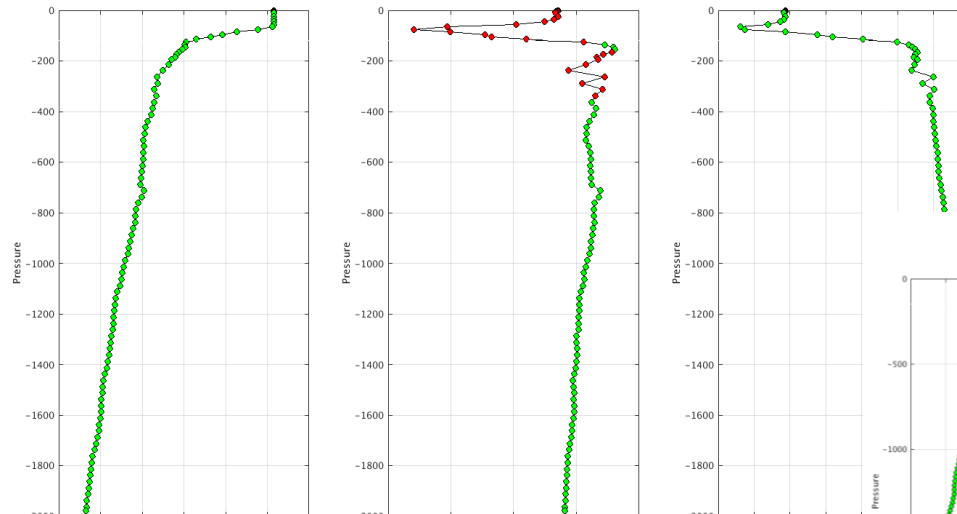


QC=4 BAD

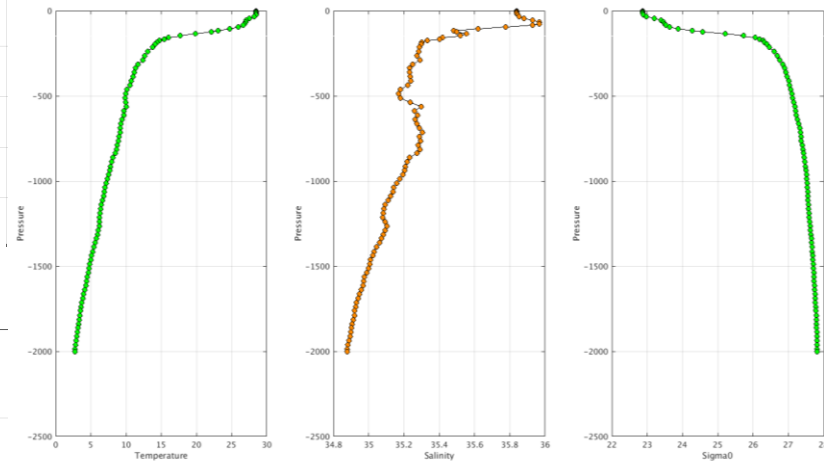


QC=1 GOOD

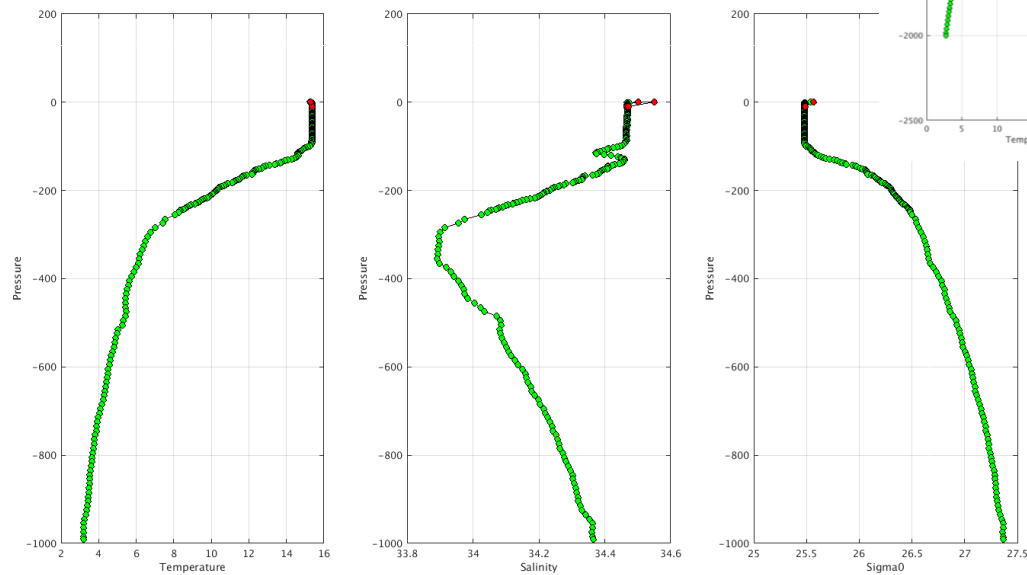
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC HZ- Float 2902622 - 12



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC HZ- Float 2902622 - 220



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC HZ- Float 2902755 - 208

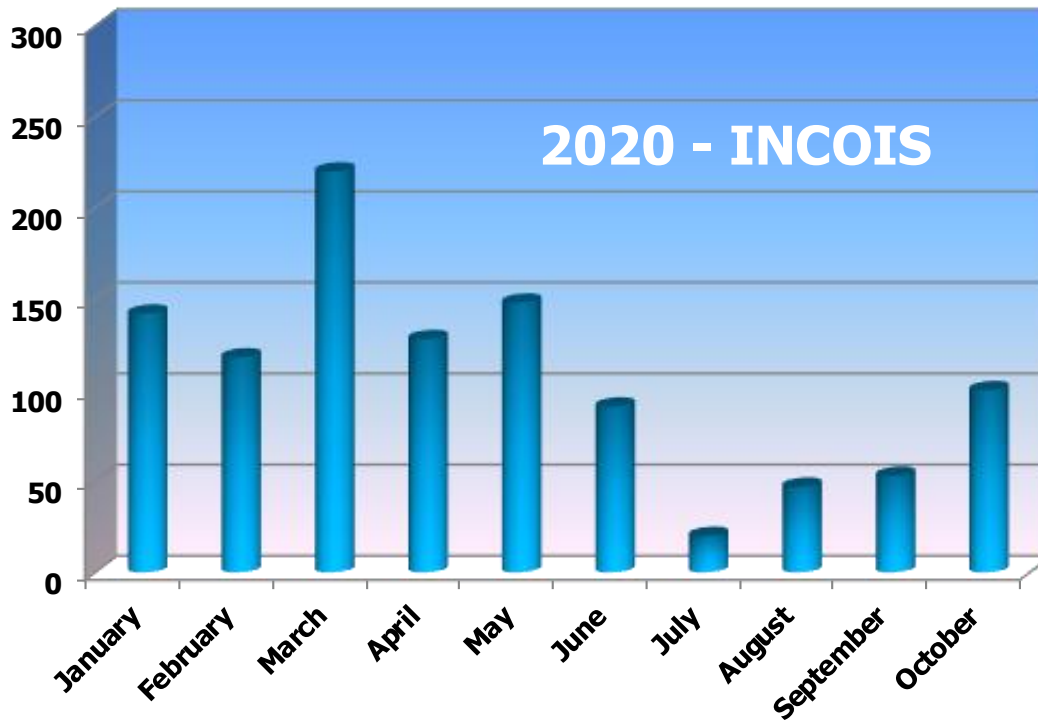
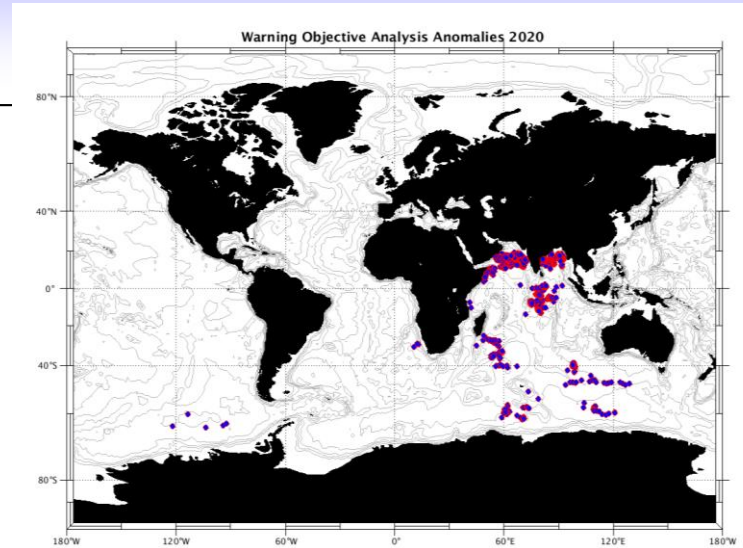


ADMT-21 - December 2020 Visio

Coriolis

ANOMALIES MONITORING

INCOIS anomalies

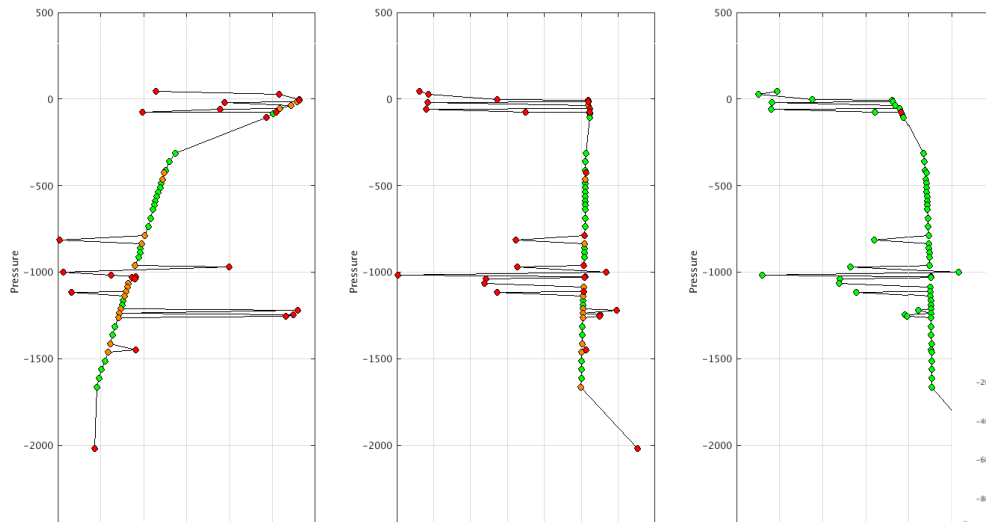


Feedback:
From T V S Uday Bhaskar

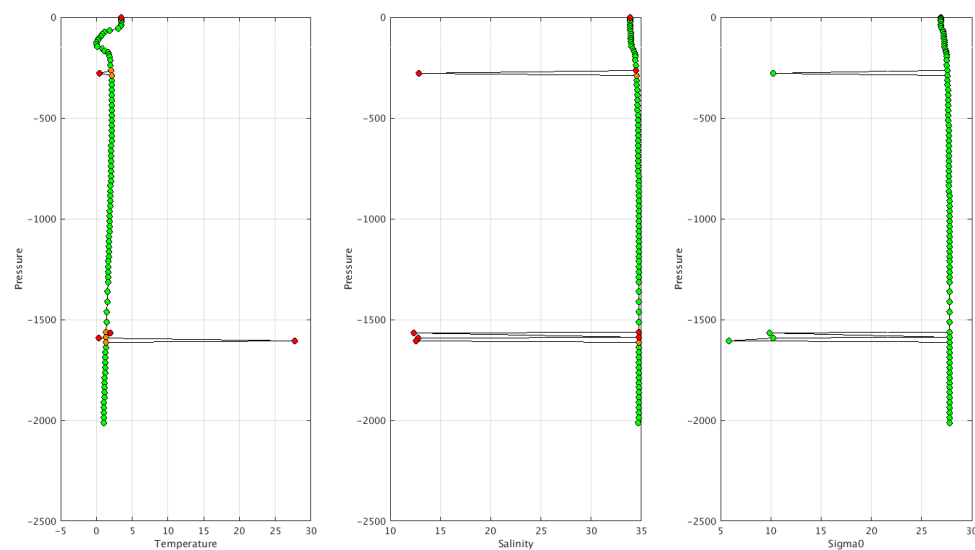
ANOMALIES MONITORING

ADMT-21 - December 2020 Visio

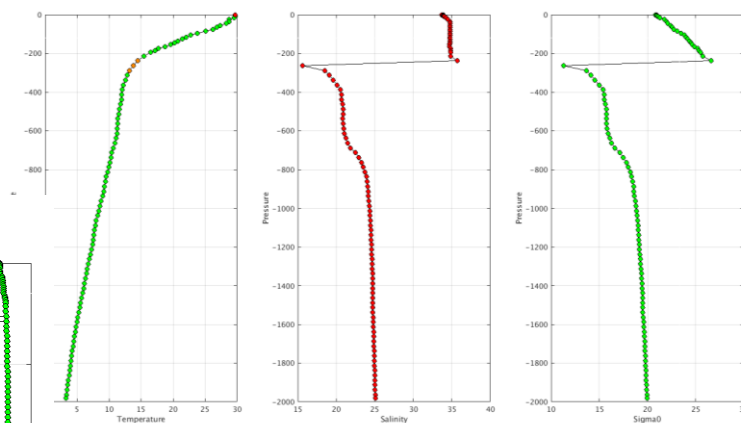
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC IN- Float 2902255 - 185



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC IN- Float 2902248 - 76

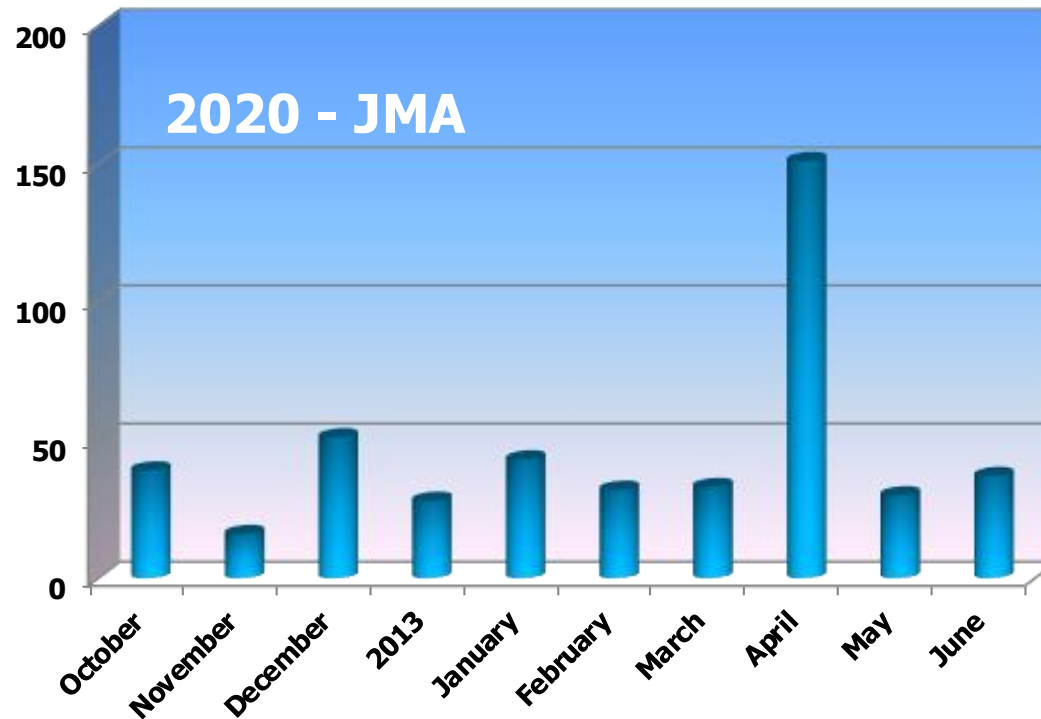
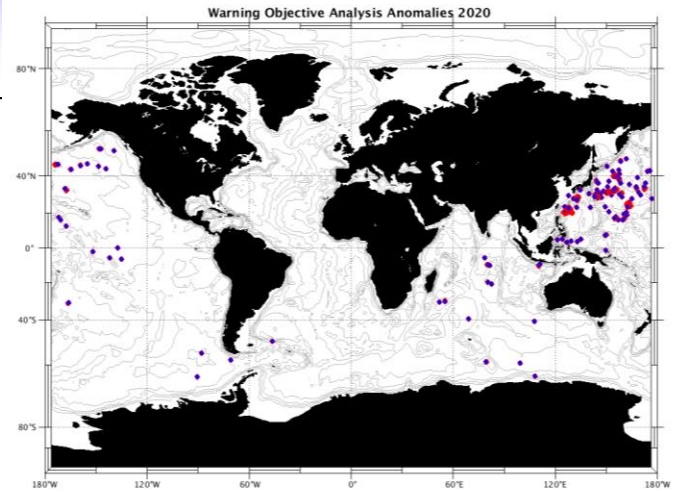


Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC IN- Float 2902266 - 43



ANOMALIES MONITORING

JMA anomalies



Feedback:
From Katsunari Sato and
Kensaku Koayashi

ANOMALIES MONITORING



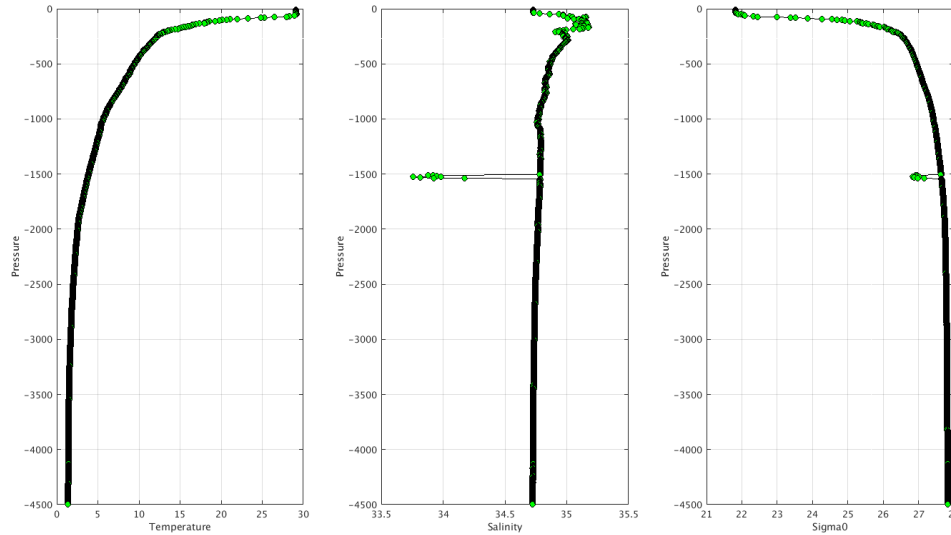
QC=4 BAD



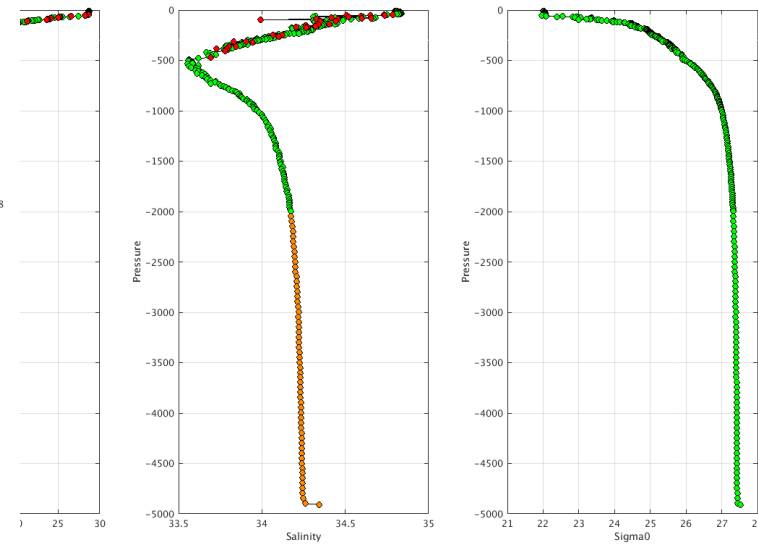
QC=1 GOOD

ADMT-21 - December 2020 Visio

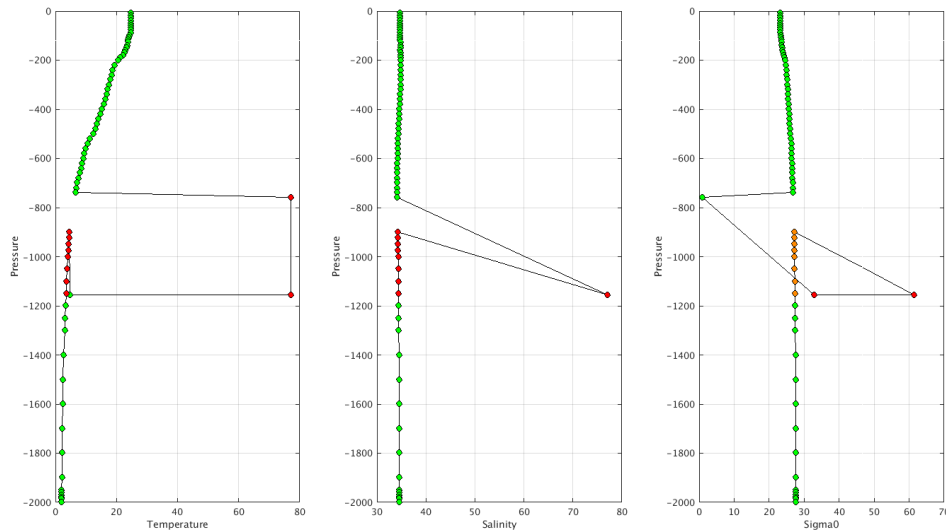
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC JA- Float 2903390 - 48



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC JA- Float 2903212 - 102



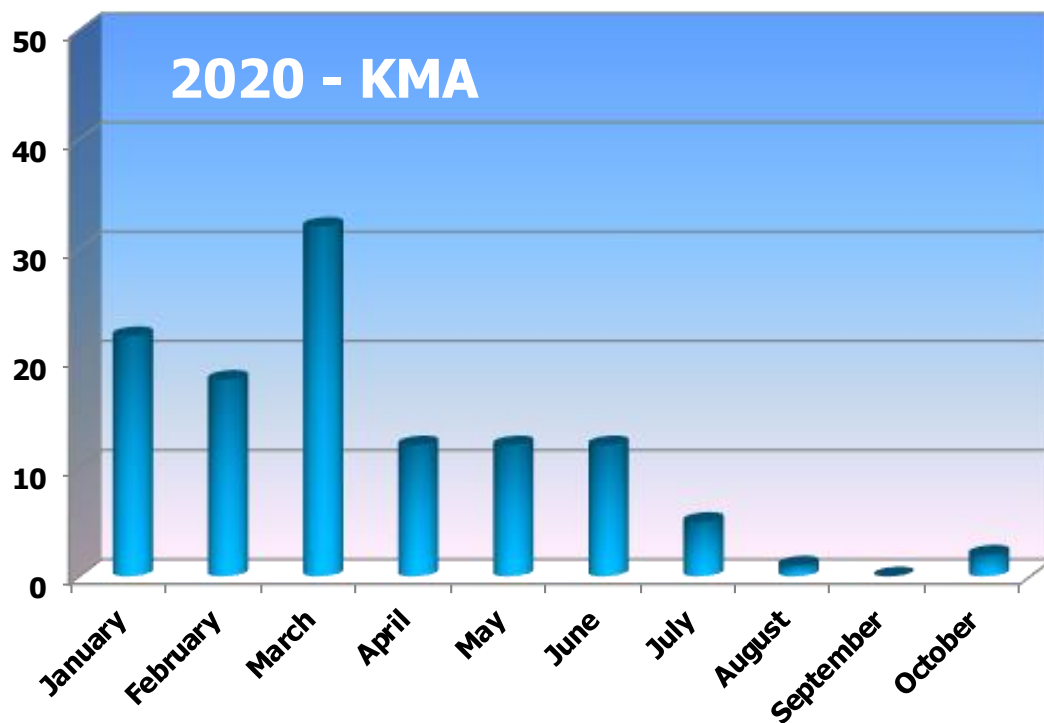
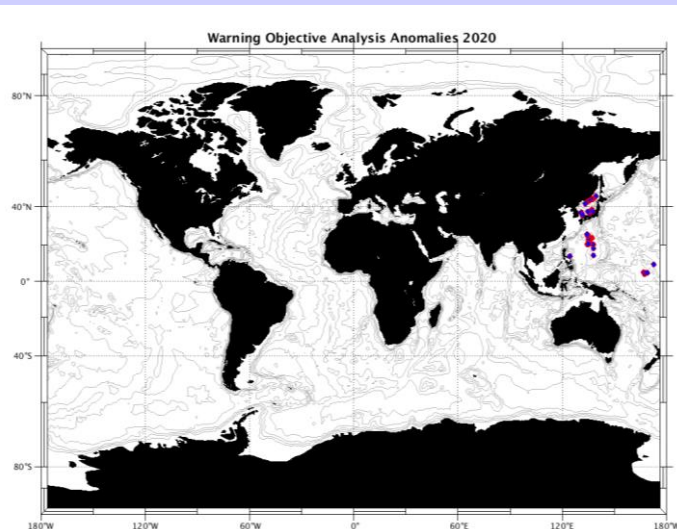
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC JA- Float 2903384 - 15



Coriolis

ANOMALIES MONITORING

KMA anomalies



Feedback:
Hyeong-jun Jo

ANOMALIES MONITORING



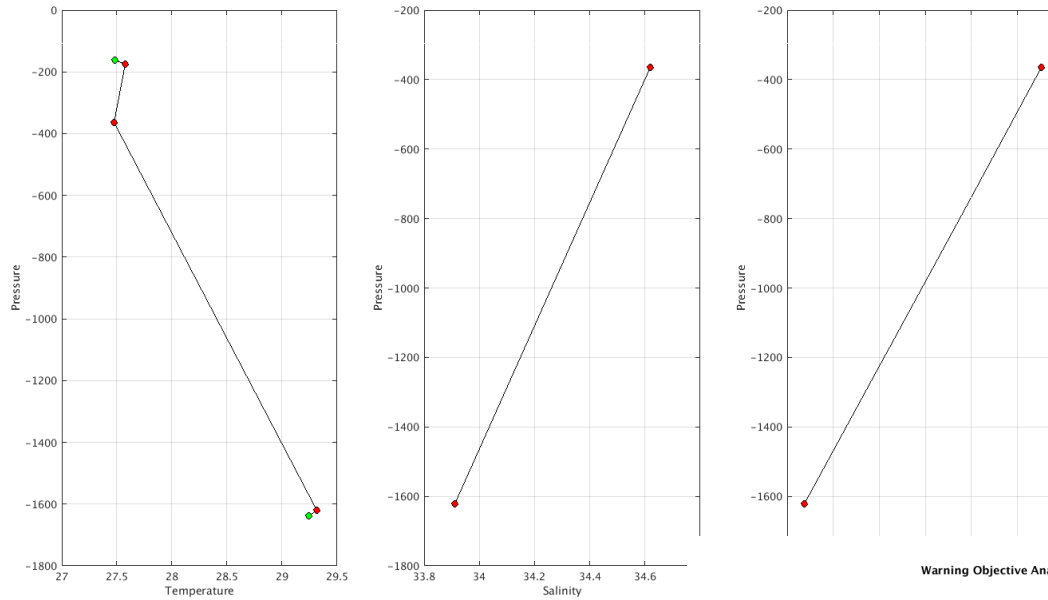
QC=4 BAD



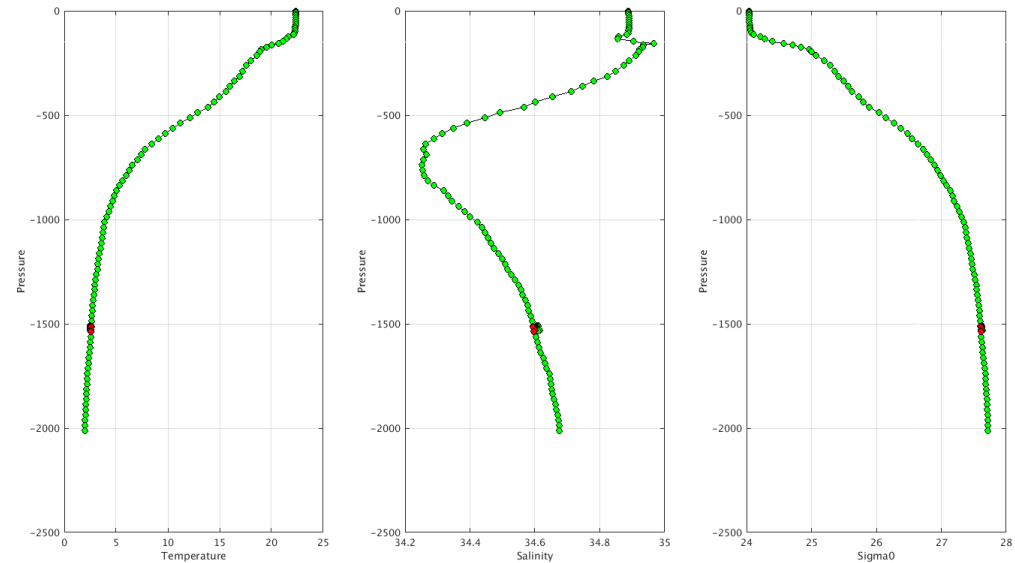
QC=1 GOOD

ADMT-21 - December 2020 Visio

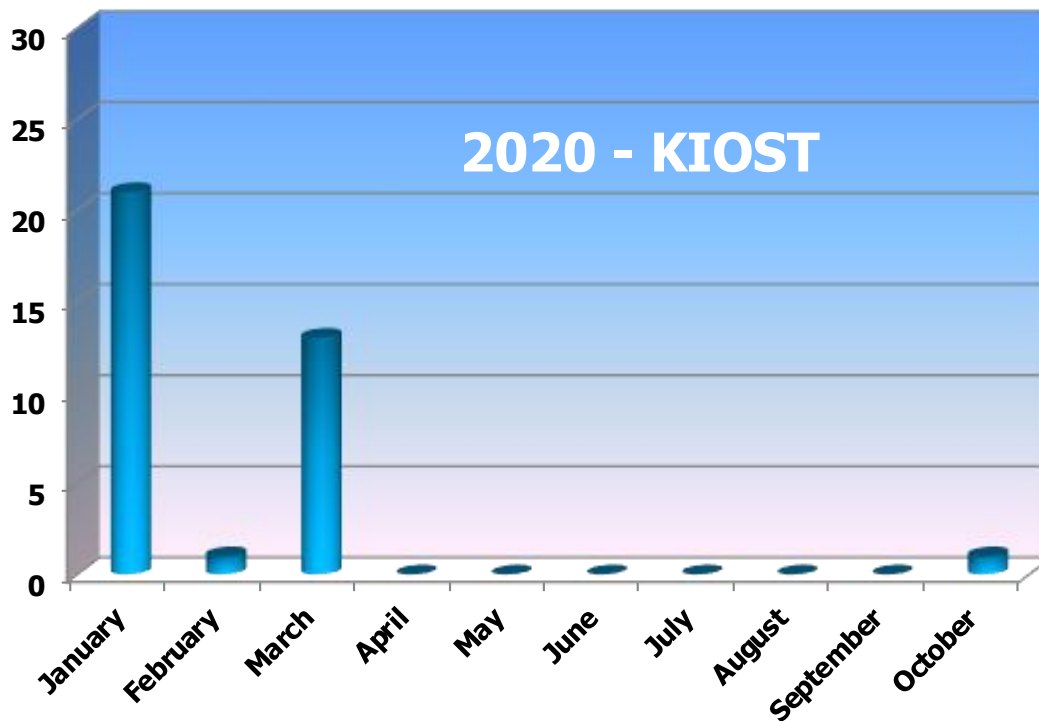
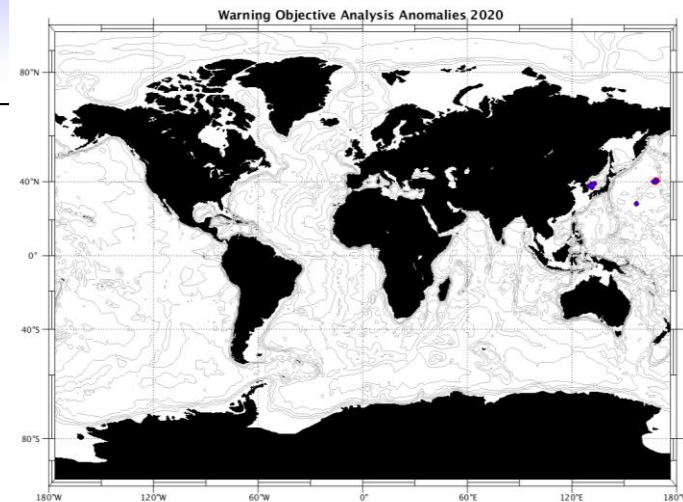
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC KM- Float 2900306 - 35



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC KM- Float 2901763 - 128



KIOST anomalies



Feedback:
Sung-Dae Kim

ANOMALIES MONITORING

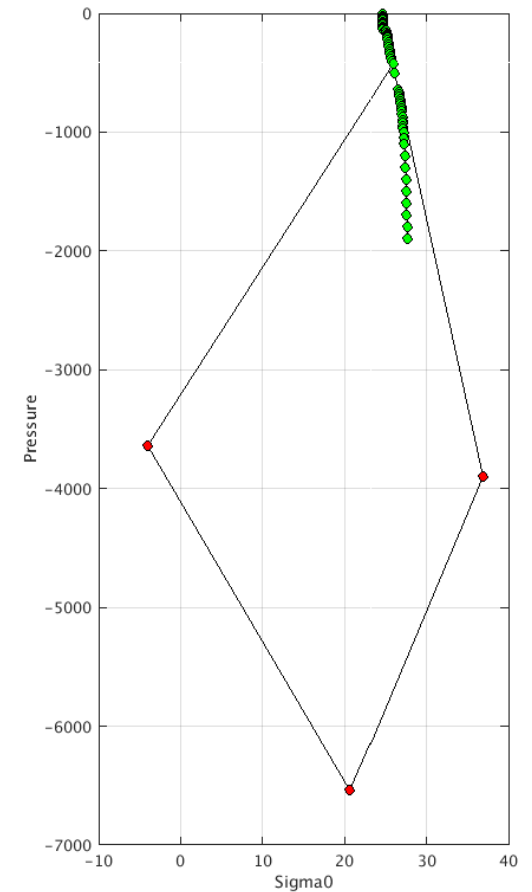
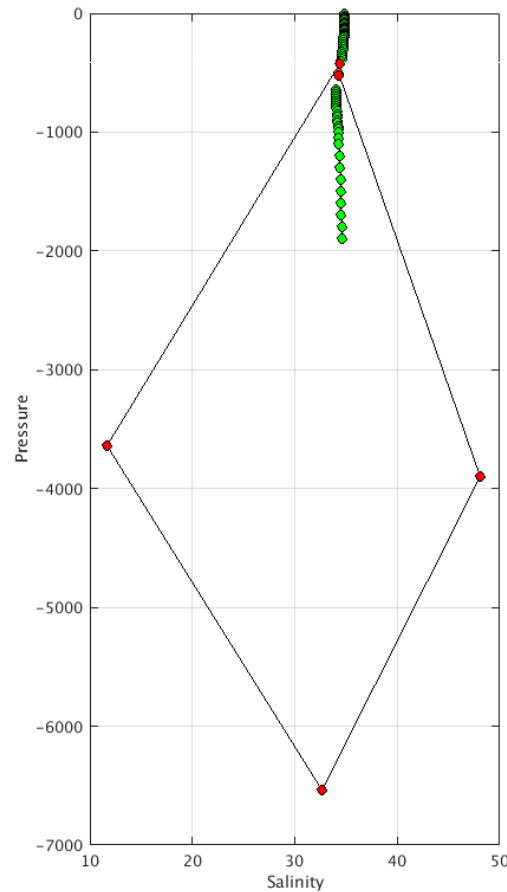
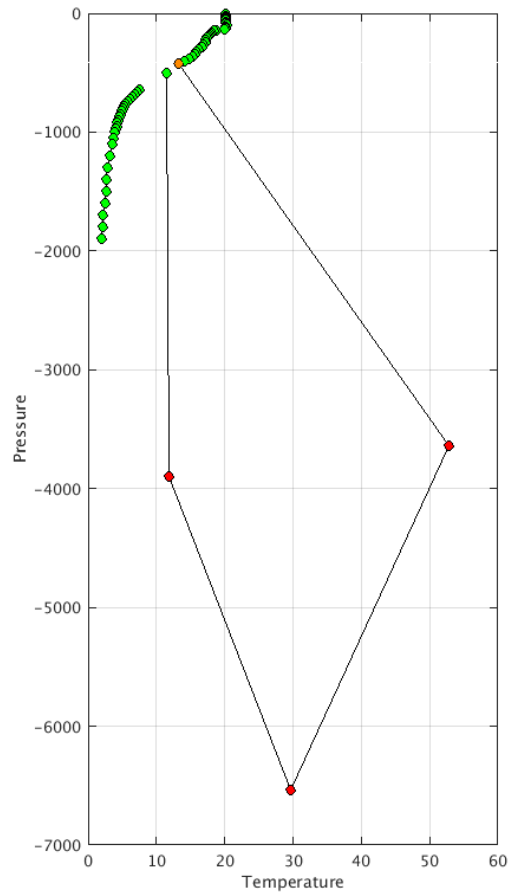


QC=4 BAD



QC=1 GOOD

Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC KO- Float 2901779 - 167

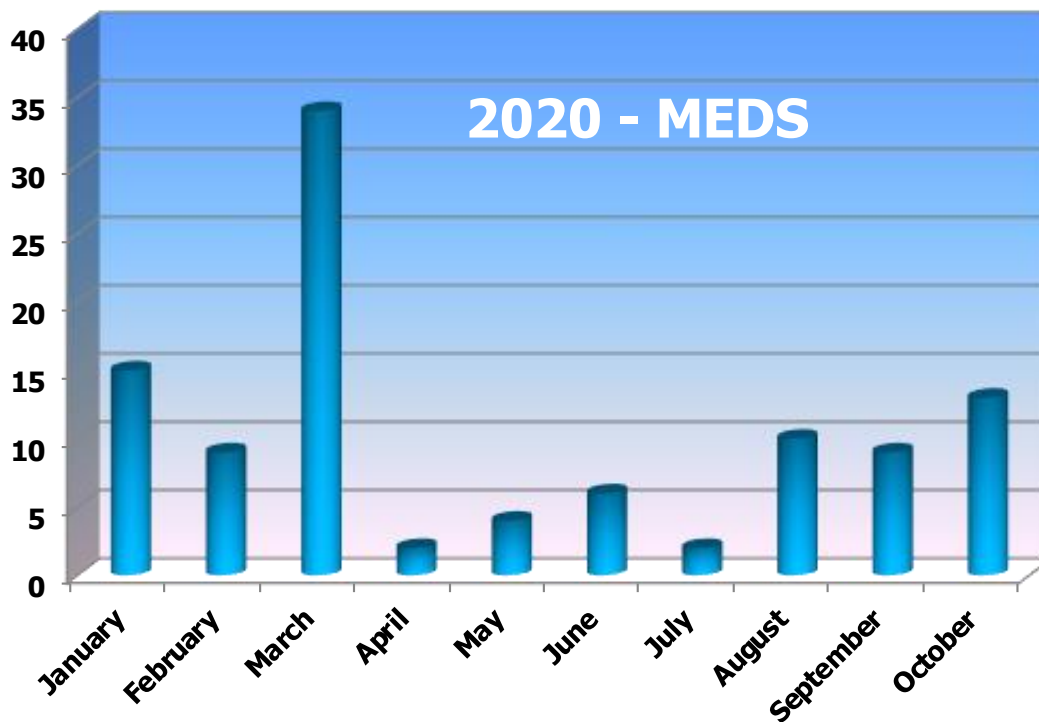
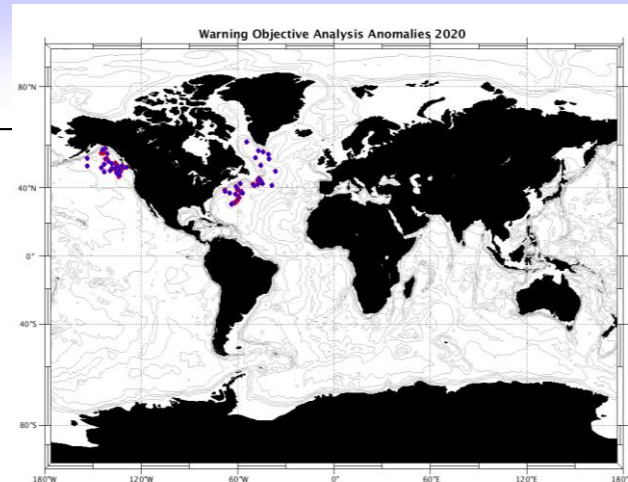


ADMT-21 - December 2020 Visio

Coriolis

ANOMALIES MONITORING

MEDS anomalies



Feedback:
Zhimin (Robert) Ma

ANOMALIES MONITORING



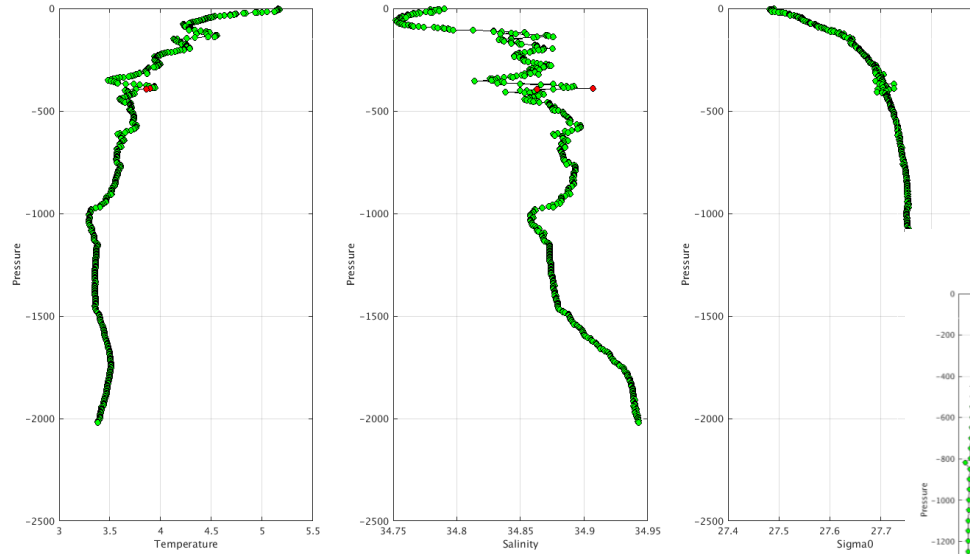
QC=4 BAD



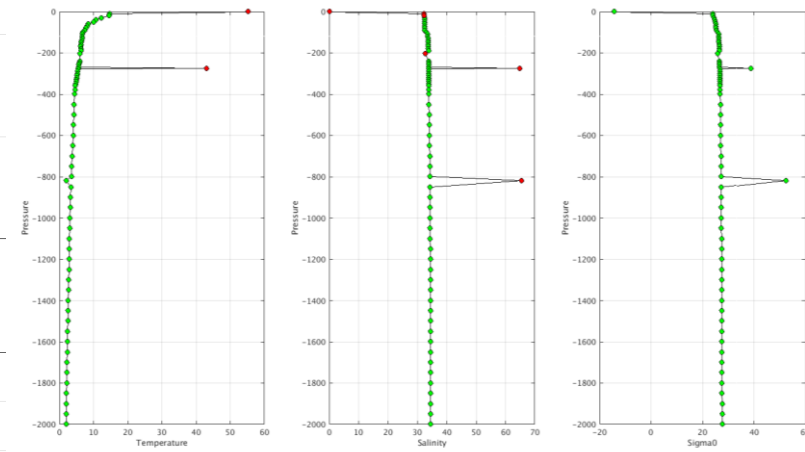
QC=1 GOOD

ADMT-21 - December 2020 Visio

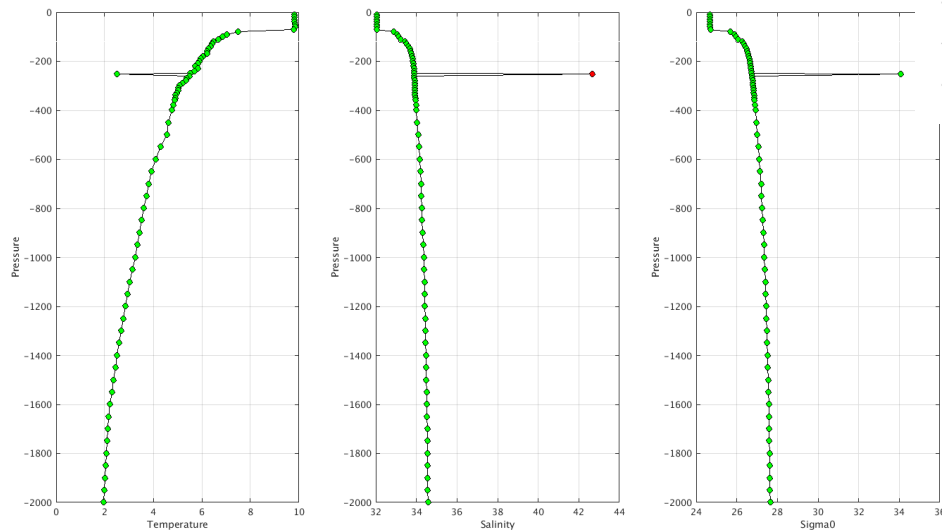
Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC ME- Float 4902409 - 94



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC ME- Float 4900117 - 88



Warning Objective Analysis Anomalies 2020 October TEMP PSAL : DAC ME- Float 4900240 - 51

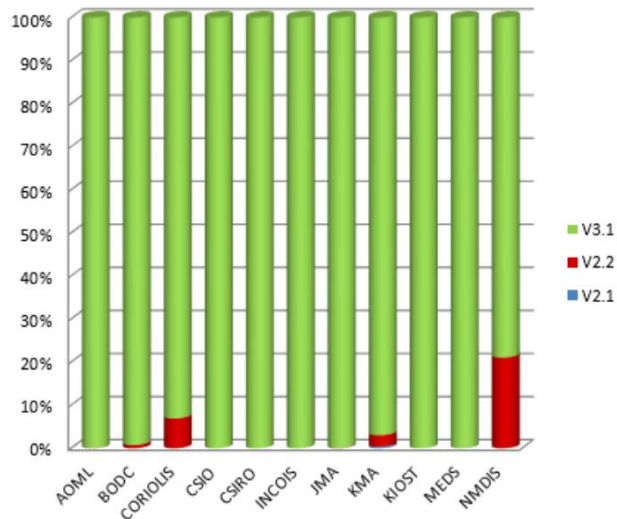


Coriolis

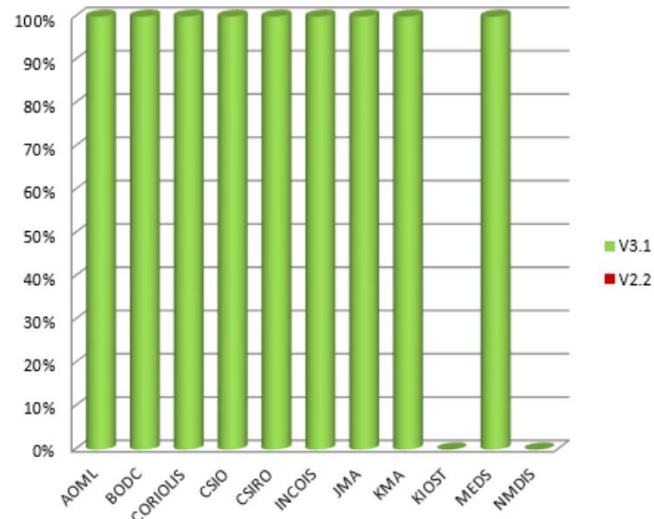
REVIEW ON FORMAT NETCDF FILES ON GDAC

ADMT-21 - December 2020 Visio

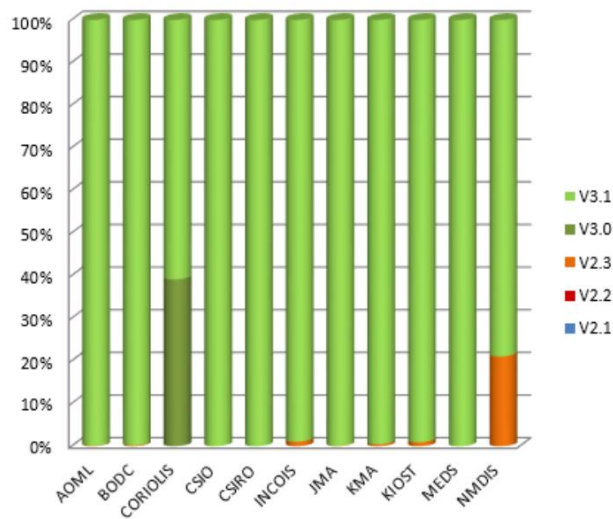
Metadata Files - Dead floats



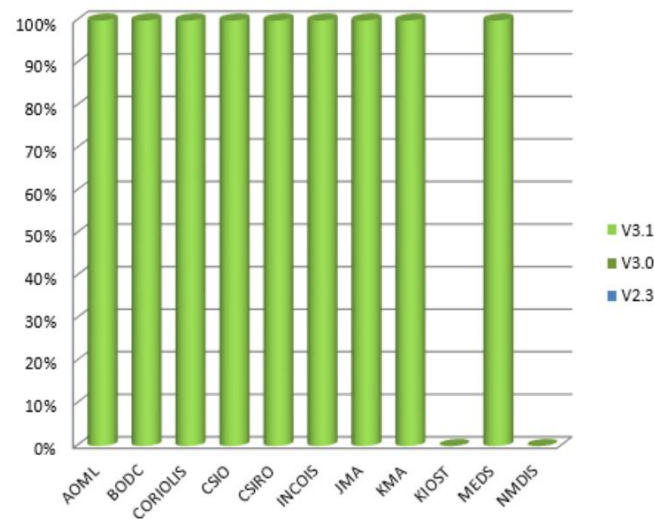
Metadata Files - Active floats



Technical Files - Dead floats



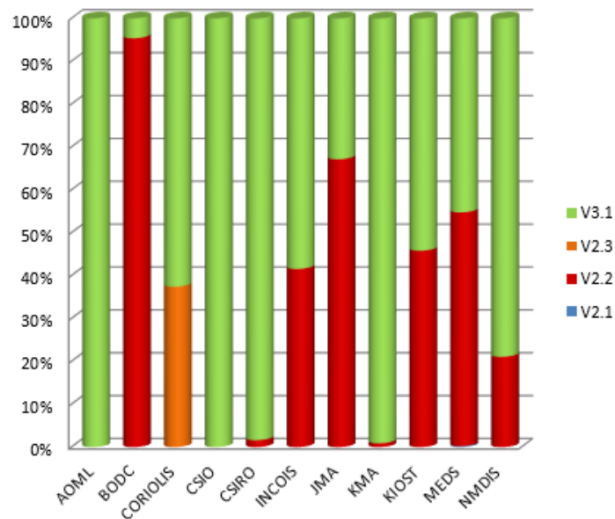
Technical Files - Active floats



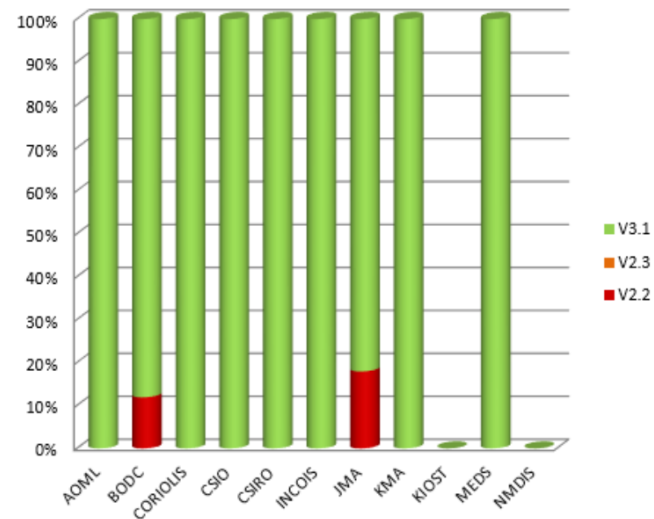
REVIEW ON FORMAT NETCDF FILES ON GDAC

ADMT-21 - December 2020 Visio

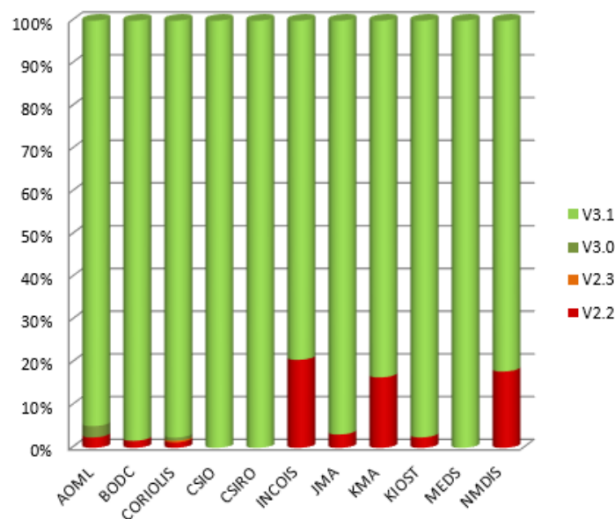
Trajectory Files - Dead floats



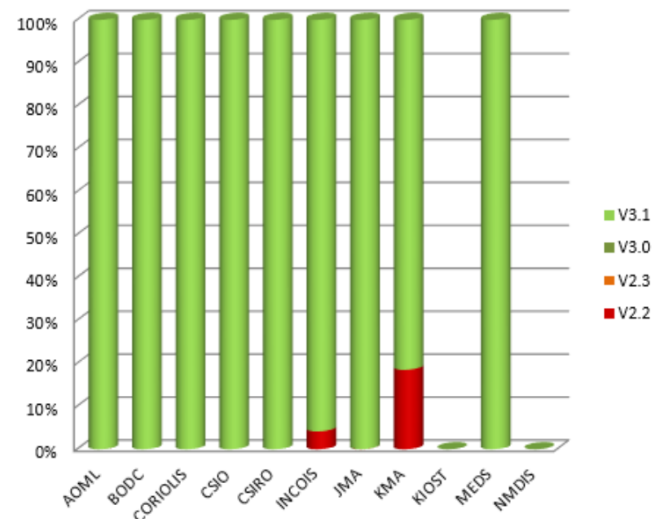
Trajectory Files - Active floats



Profile files - Dead floats

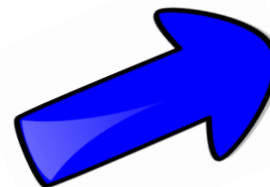
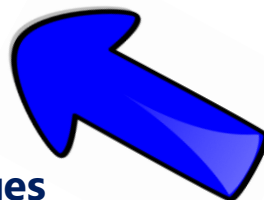
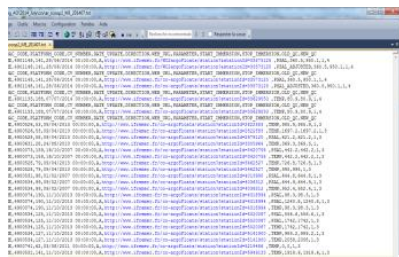


Profile Files - Active floats



THANKS

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**Message - QC changes
To DAC operators**

ftp site

<ftp://ftp.ifremer.fr/ifremer/argo/etc/ObjectiveAnalysisWarning/>



**Monthly report
To argo-dm / argo-dm-dm**

Please look at the messages/report !!



Mail to : christine.coatanoan@ifremer.fr or codac@ifremer.fr

Coriolis