



Arvor-Provor Technical Workshop

Monitoring Argo floats – Euro-Argo

Ifremer, 28-30 January 2020



Monitoring Argo floats

<https://fleetmonitoring.euro-argo.eu/>

- Targeted audience
- Demo
- Use cases
- Discussions



- “Visualization of Argo profiling float metadata, ocean measurements, trajectories and technical parameters”
- For
 - Argo fleet operators
 - PIs
 - General public and communication activities
 - ARCs



Monitoring Argo floats – Demo

<https://fleetmonitoring.euro-argo.eu/dashboard>

- “Visualization of Argo profiling **float metadata**, ocean measurements, trajectories and technical parameters”

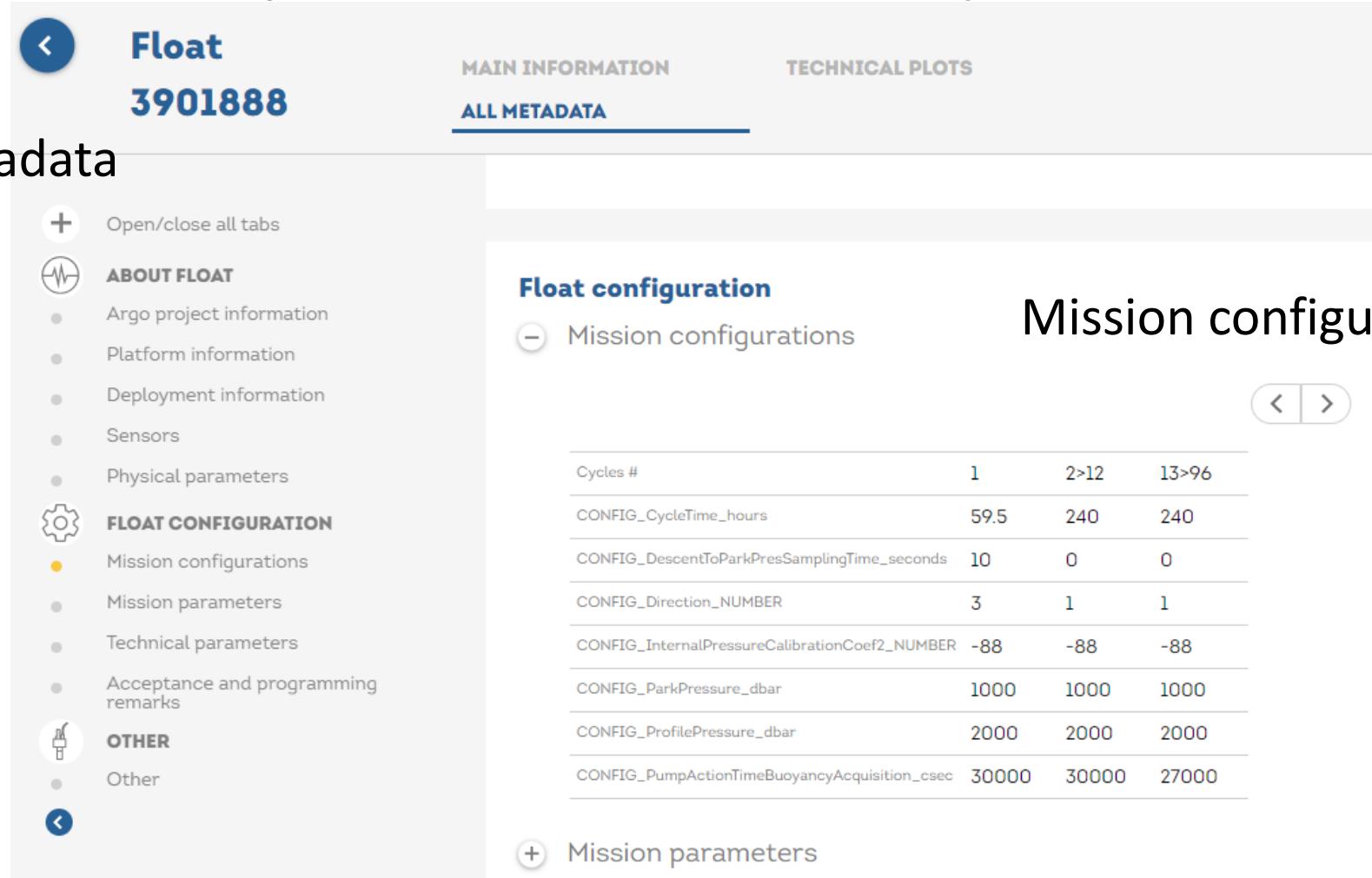
Float
5903795

MAIN INFORMATION **TECHNICAL PLOTS**

ALL METADATA

About Float		Deployment 7 years ago		Cycle activity	
WMO 5903795	Maker SIO_IDG	Launched 15/10/2011 23:57:14	Deployment Latitude -9.012	Deployment Longitude -158.748	Status Active
Inst reference 3017	Platform type SOLO	Ship R/V Kaharoa	Cruise	Age 7.98 years old	Last station date 07/10/2019
Transmission system ARGOS	PTT 45827	Project US ARGO PROJECT	Principal Investigator DEAN ROEMMICH	Cycle 285	07:38:25
Owner AOML				Last Surface Data 5.5 dbar 28.088°C 36.216 PSU	
Sensors CTD_PRES, CTD_TEMP, CTD_CNDC				Last Bottom Data 1452 dbar 2.812°C 34.666 PSU	
				Stations data in Ascii in Netcdf	Trajectory data in Ascii in Netcdf
				Grey List PSAL	

- “Visualization of Argo profiling **float metadata**, ocean measurements, trajectories and technical parameters”



Hierarchized metadata

Float
3901888

MAIN INFORMATION TECHNICAL PLOTS

ALL METADATA

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Open/close all tabs

ABOUT FLOAT

- Argo project information
- Platform information
- Deployment information
- Sensors
- Physical parameters

FLOAT CONFIGURATION

- Mission configurations
- Mission parameters
- Technical parameters
- Acceptance and programming remarks

OTHER

- Other

Float configuration

- Mission configurations

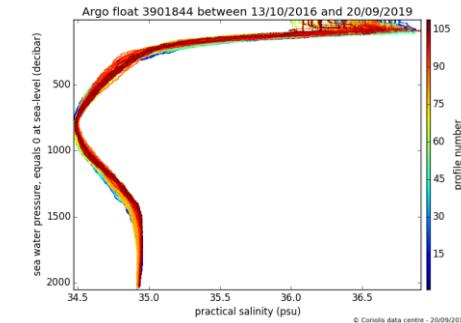
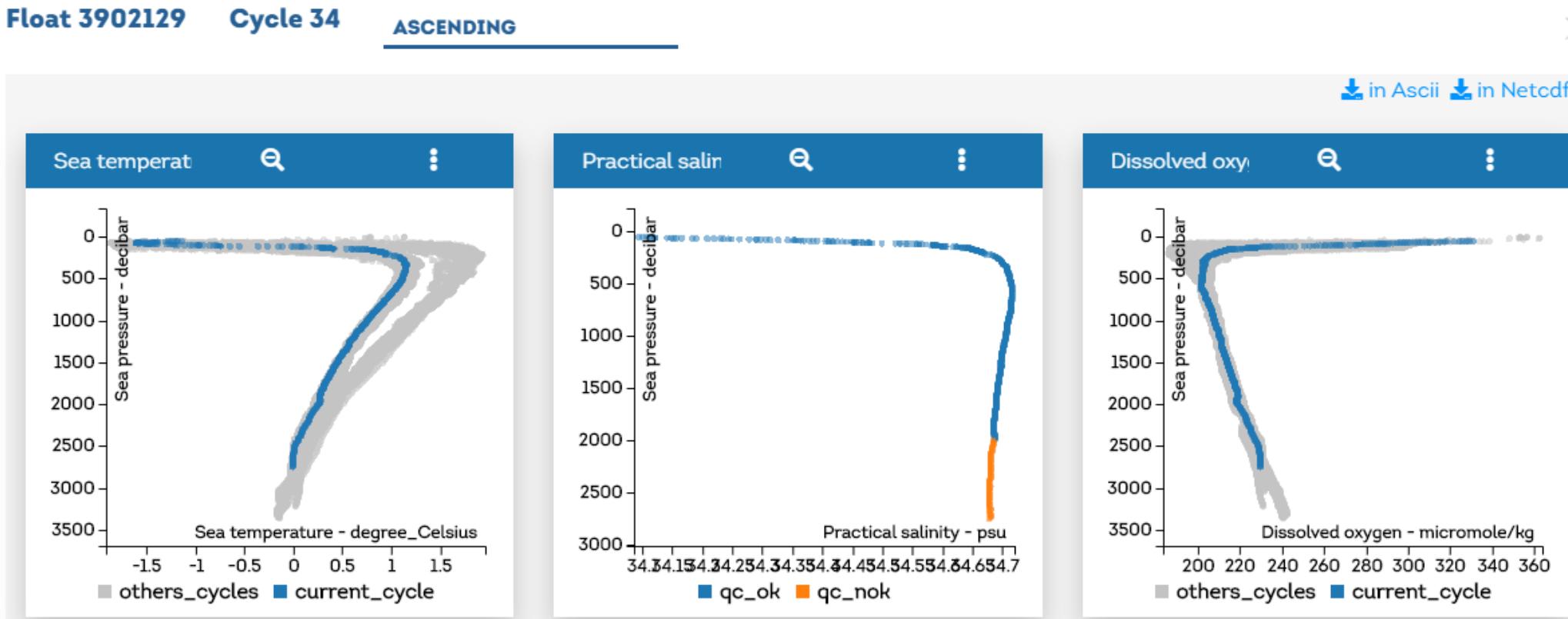
Cycles #	1	2>12	13>96
CONFIG_CycleTime_hours	59.5	240	240
CONFIG_DescentToParkPresSamplingTime_seconds	10	0	0
CONFIG_Direction_NUMBER	3	1	1
CONFIG_InternalPressureCalibrationCoef2_NUMBER	-88	-88	-88
CONFIG_ParkPressure_dbar	1000	1000	1000
CONFIG_ProfilePressure_dbar	2000	2000	2000
CONFIG_PumpActionTimeBuoyancyAcquisition_csec	30000	30000	27000

Mission configurations

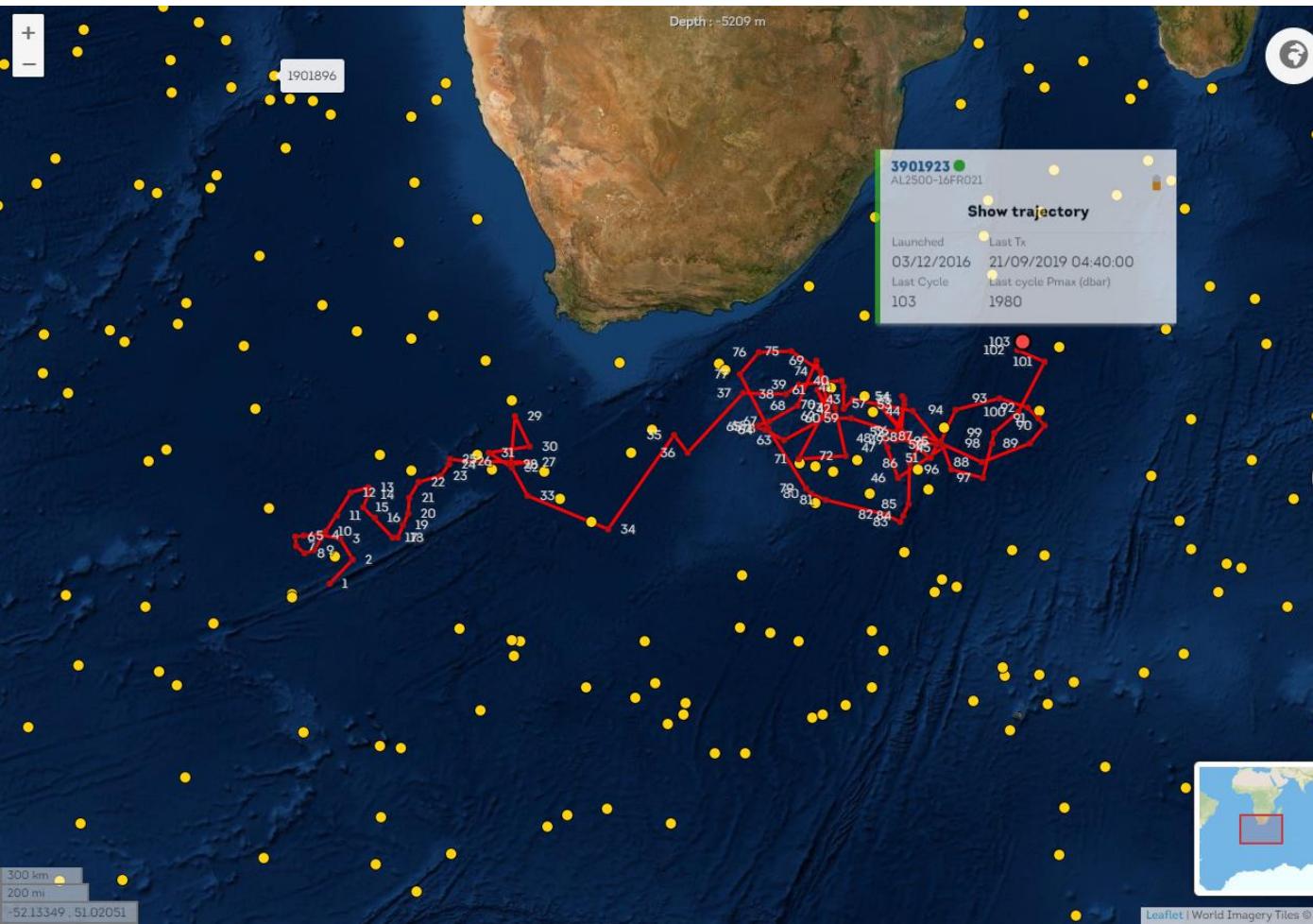
< >

Mission parameters

- “Visualization of Argo profiling float metadata, **ocean measurements**, trajectories and technical parameters”
- In link with popup data selection tool

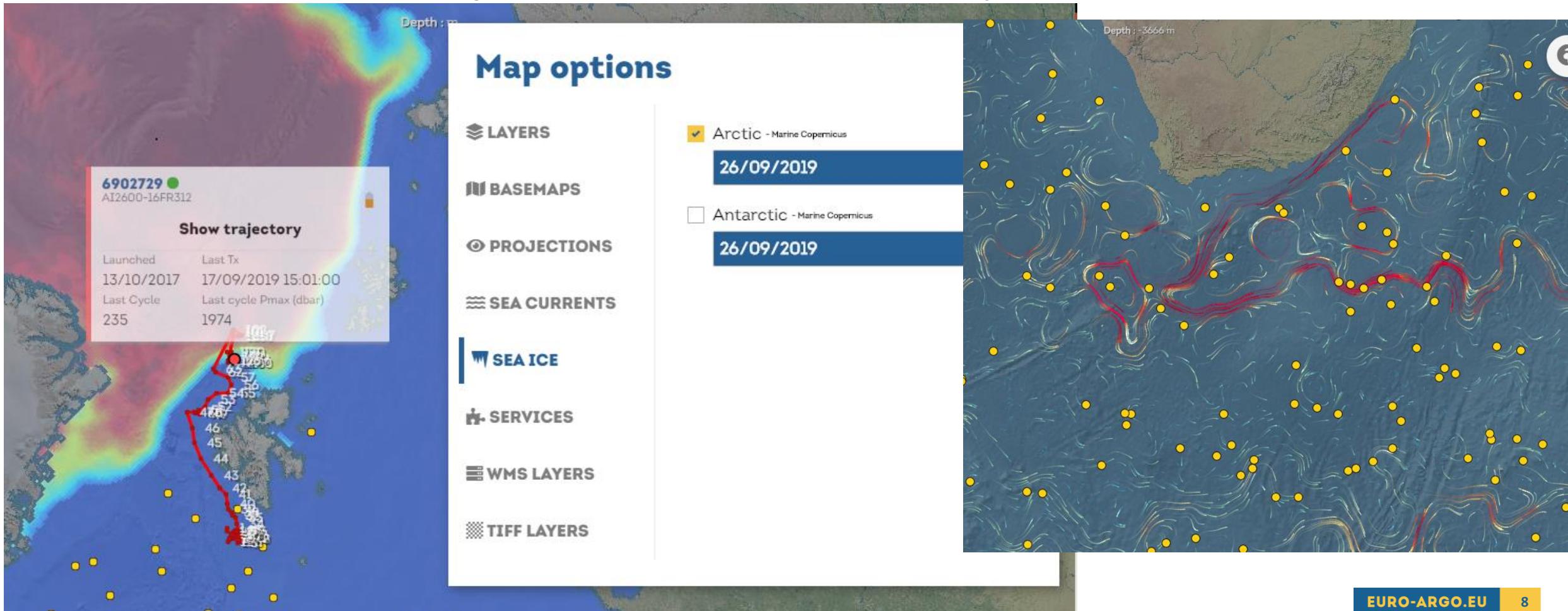


- “Visualization of Argo profiling float metadata, ocean measurements, **trajectories** and technical parameters”

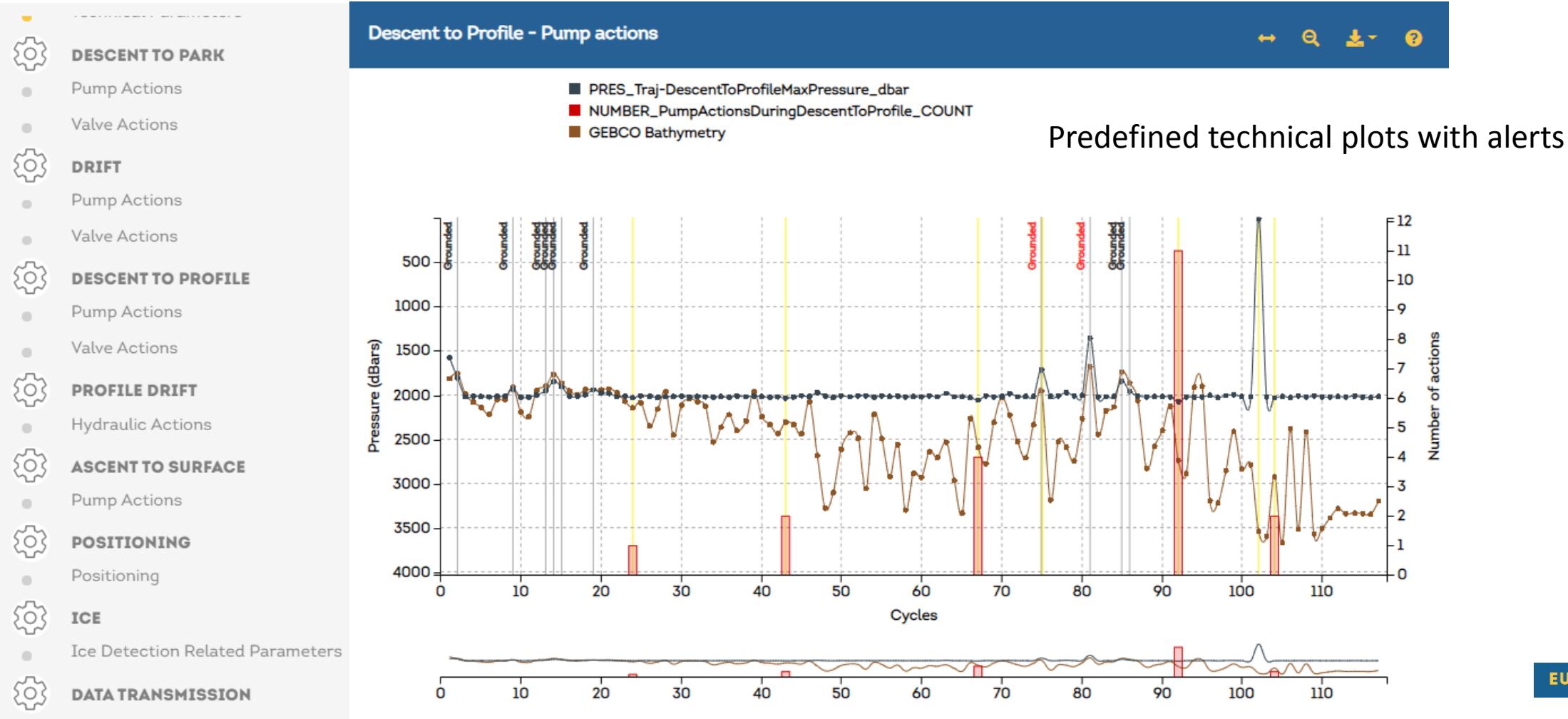


- Basemaps
- Projections
- Context (depth, sea ice, sea currents, etc.)
- Last position of all floats
- ...

- “Visualization of Argo profiling float metadata, ocean measurements, **trajectories** and technical parameters”



- “Visualization of Argo profiling float metadata, ocean measurements, trajectories and **technical parameters**”

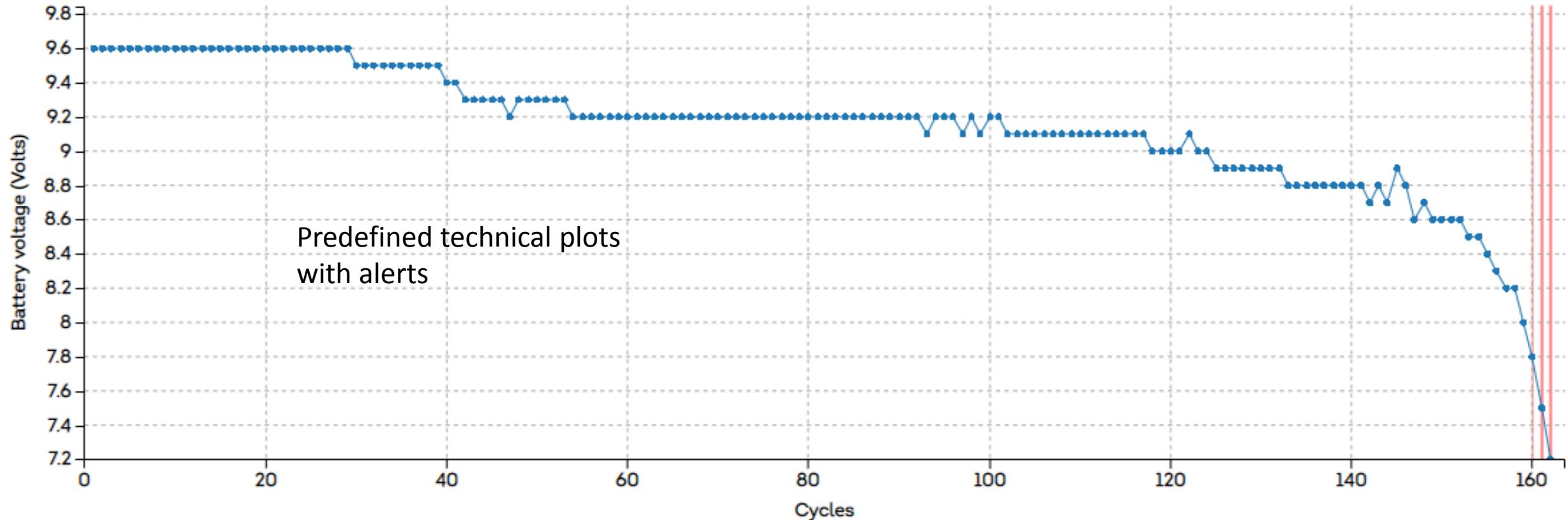




Monitoring Argo floats – Demo

<https://fleetmonitoring.euro-argo.eu/dashboard>

- “Visualization of Argo profiling float metadata, ocean measurements, trajectories and **technical parameters**”





Monitoring Argo floats – Demo

<https://fleetmonitoring.euro-argo.eu/dashboard>

• Dashboard

🔍

DASHBOARD ⟳

Status

- Inactive 263
- Active 612

Year of deployment

- 2019 495
- 2018 660
- 2017 699
- 2016 612
- ...

Country

- France 34
- Germany 30
- Europe 30
- United Kingdom 25
- ...

Basin

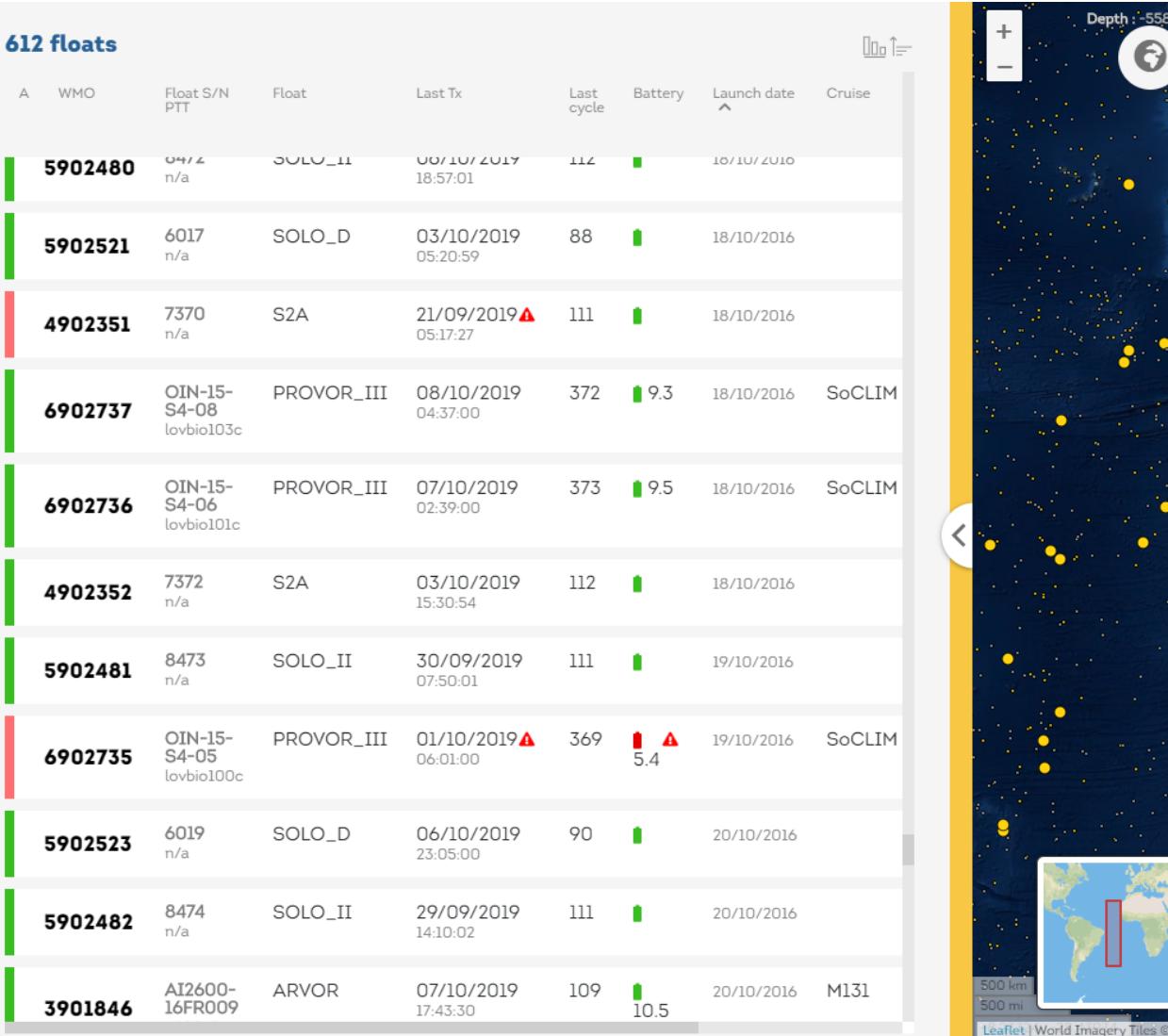
- Pacific ocean 223
- Indian ocean 200
- Atlantic ocean 154
- Arctic ocean 15
- ...

Telecom

- IRIDIUM 502
- ARGOS 110

DAC

- AOML 351
- CORIOLIS 105



- Indexes
- Results table
- Link to float pages
- Alerts
- Map



Monitoring Argo floats

<https://fleetmonitoring.euro-argo.eu/>

- Use cases



Dashboard – ALERTS

- Your floats (selection through indexes)

The dashboard displays information on float last cycle only

- Sort by Alert

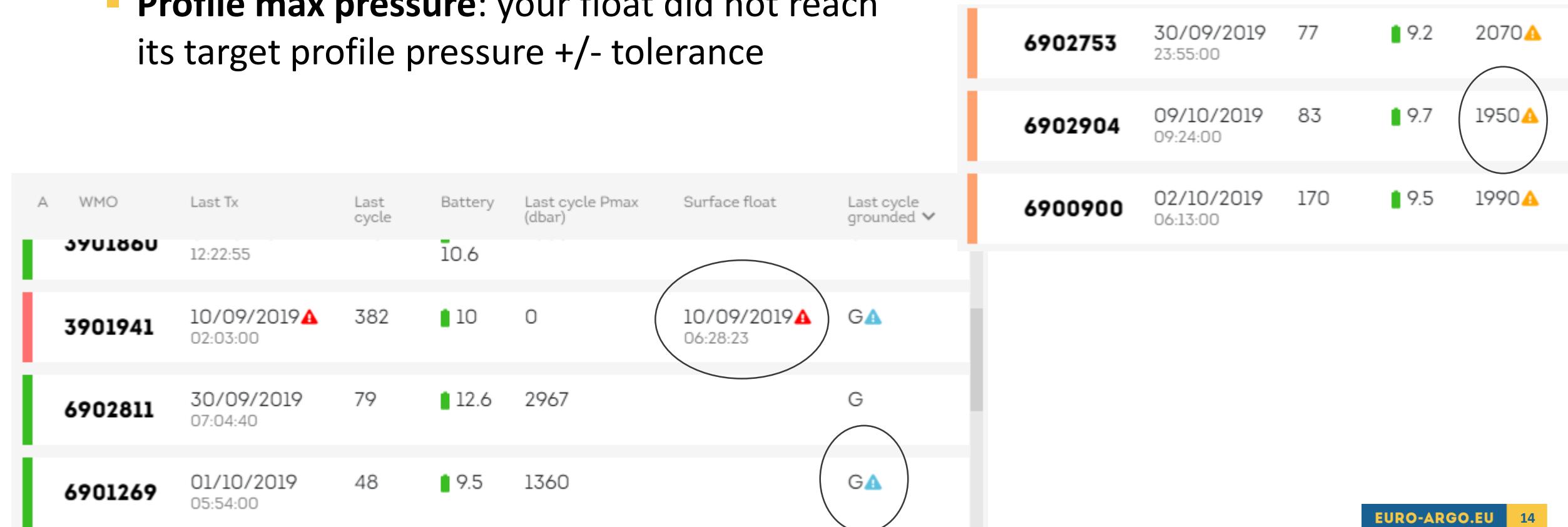
- **Missing Profile** (today > cycle_period + last Tx): your float is probably dead or not decoded
- **Battery**: your float will probably die soon; consider recovery?

6901677	OIN-14- AR-32 140824	ARVOR	08/10/2019 07:27:00	154	6.9	29/07/2015
6902631	OIN- 15D- ARL-11 152046	ARVOR	25/09/2019 12:13:00	141	6.9	15/11/2015
6901735	OIN-14- AR-74 144178	ARVOR	28/09/2019 20:31:00	165	6.9	31/03/2015



Dashboard – ALERTS

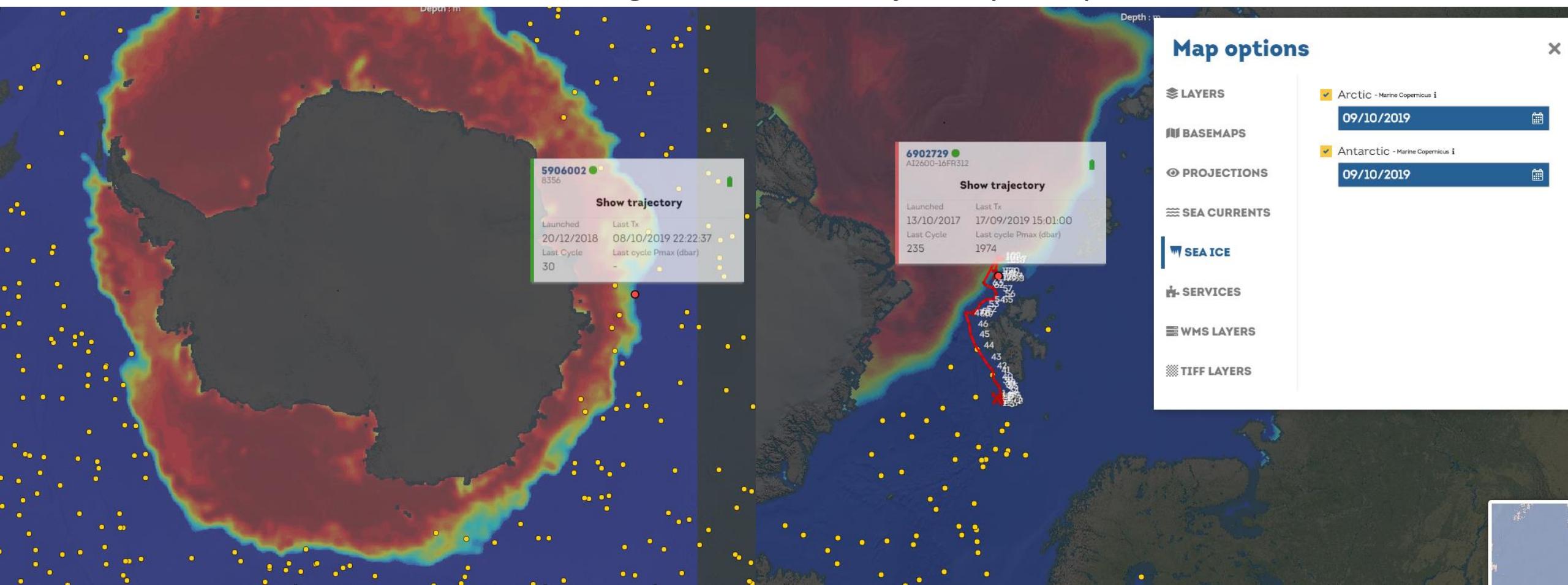
- **Surface** (EOL messages, grounded @ 0 dbar, tech messages but not profile data, saturation of valve actions during buoyancy reduction phase, etc.): check your float!
- **Grounding** (alert if not coherent with bathy; to be refined)
- **Profile max pressure**: your float did not reach its target profile pressure +/- tolerance





Dashboard – Map – ICE

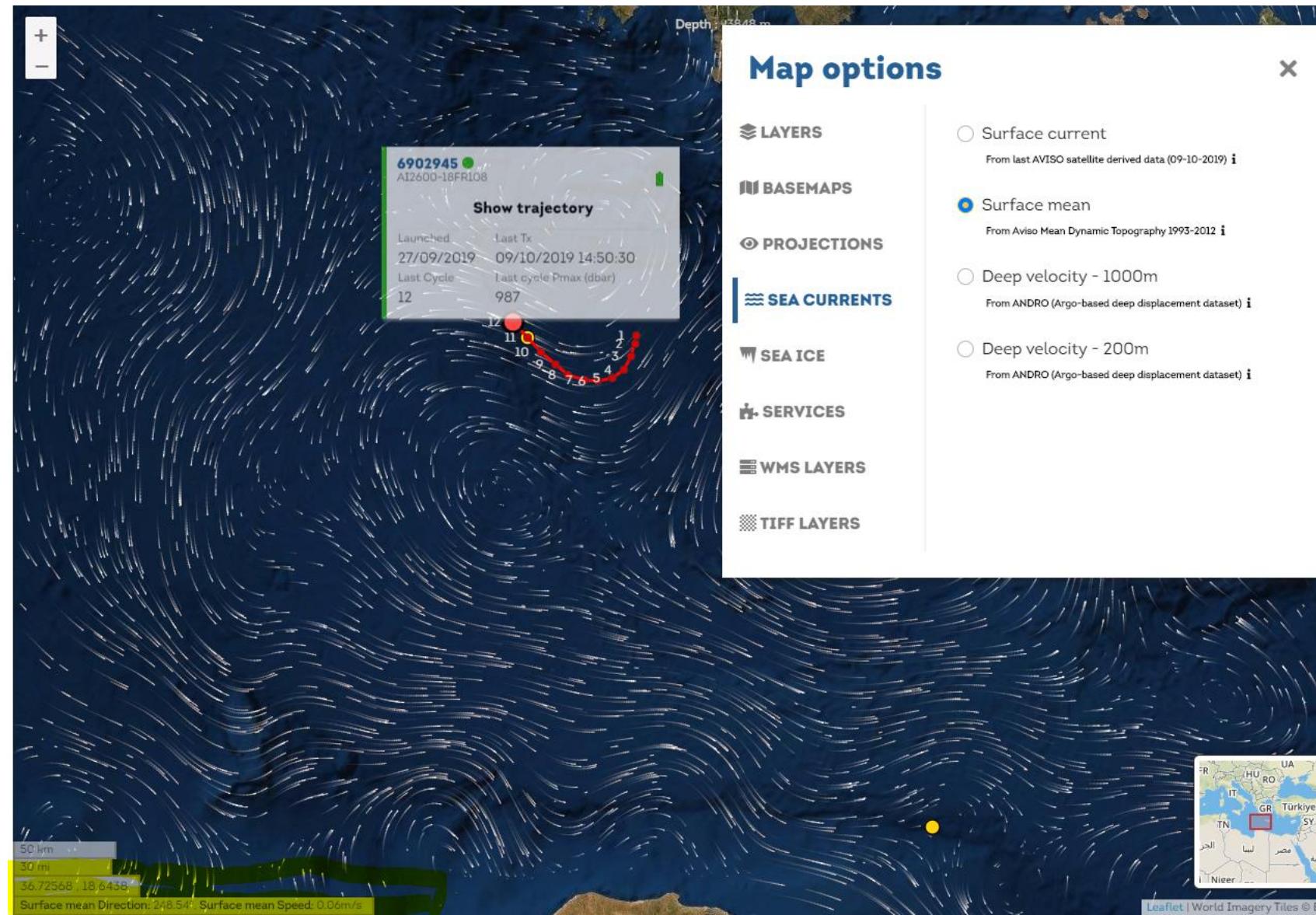
- **Check float positions with last sea ice edge:**
adjust float parameters (ISA, cycle period etc.) before the float is trapped under ice;
- Go back in time to check ice edges with float trajectory and profile dates





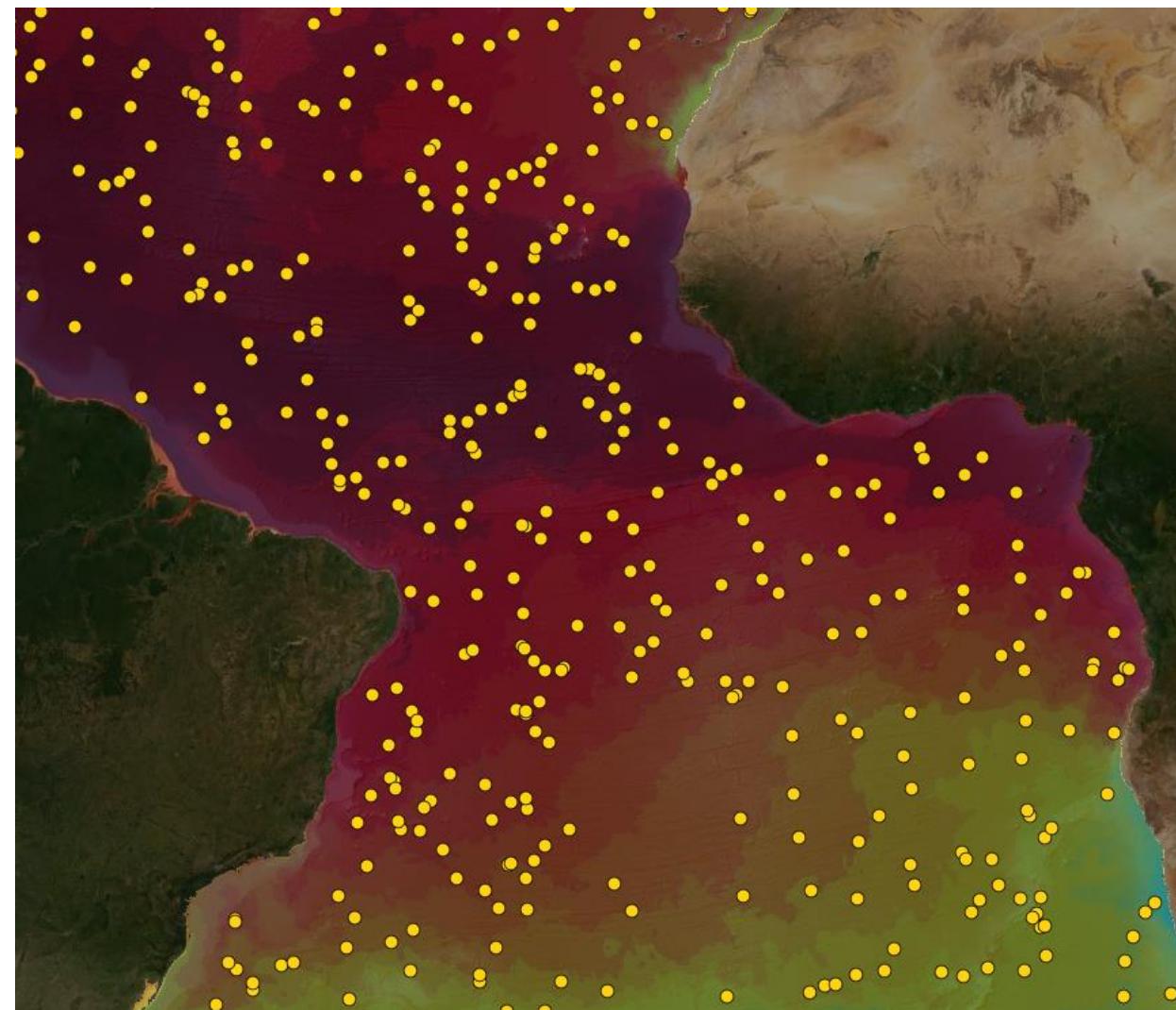
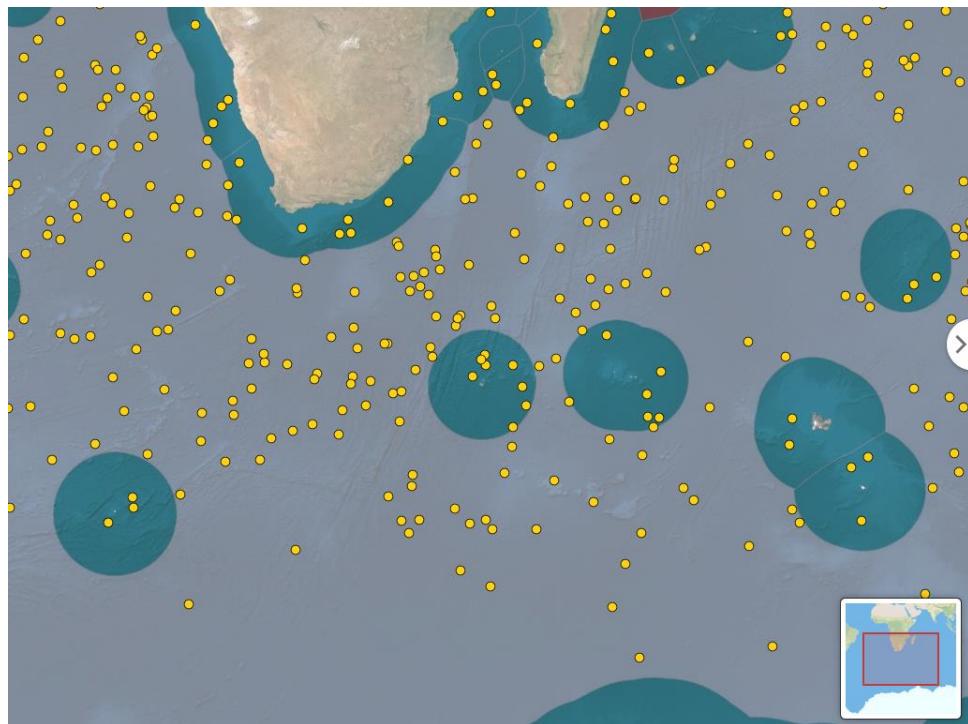
Dashboard – Map – CURRENTS

- Float trajectory with surface current (AVISO) deep current (ANDRO)



Dashboard – Map – Other Layers

- Sea Surface Temperature
- EEZ
- (*GetFeatureInfo not working currently*)



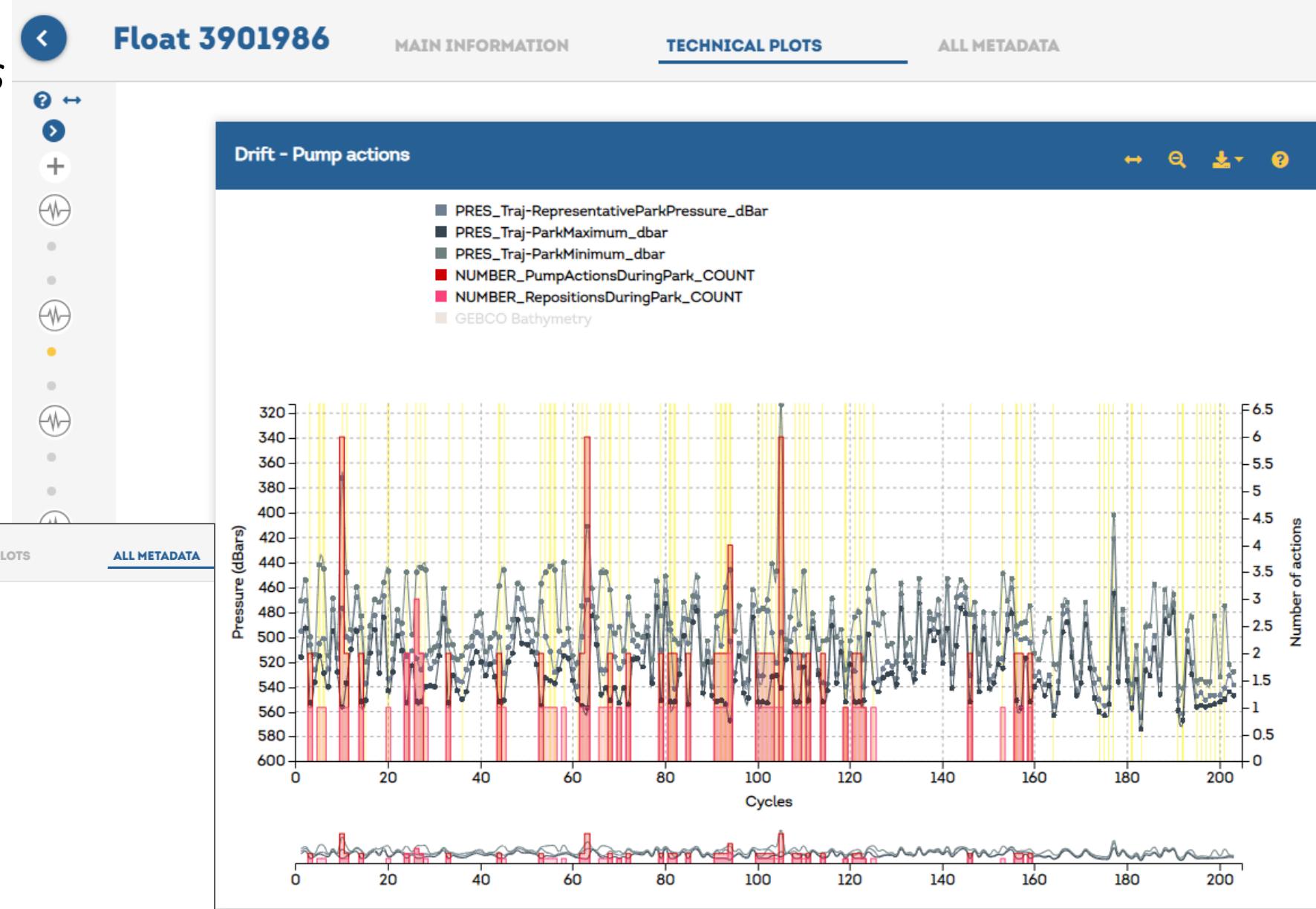


Float page – Technical plots – HYDRAULIC

- Stabilisation problems during drift (pump actions)
- Increased tolerance after cycle 161

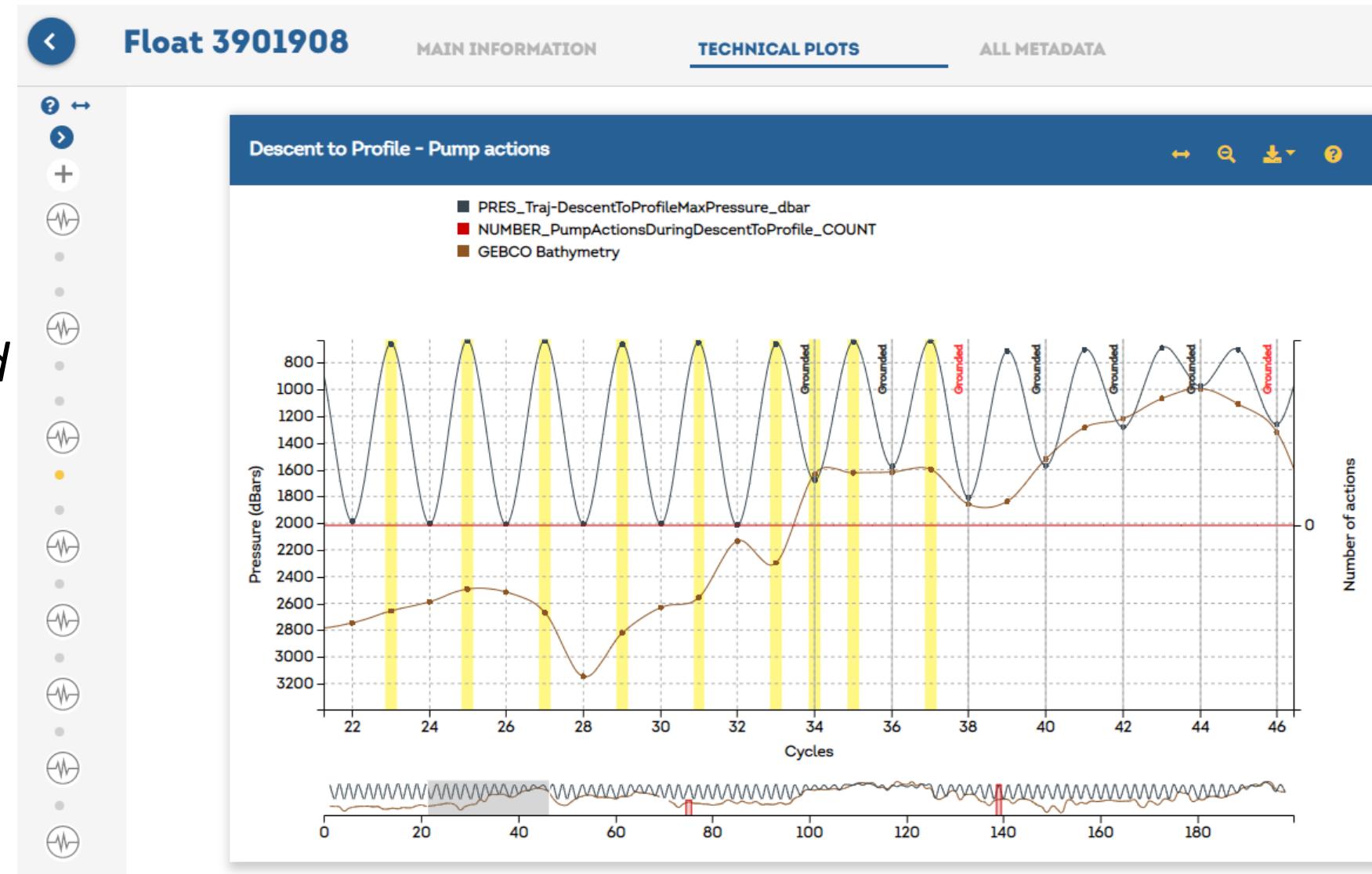
Float 3901986

MAIN INFORMATION			TECHNICAL PLOTS			ALL METADATA		
Float configuration								
Mission configurations								
Cycles #	1	2>160	161>203	PRES_Traj-RepresentativeParkPressure_dBar	PRES_Traj-ParkMaximum_dbar	PRES_Traj-ParkMinimum_dbar	NUMBER_PumpActionsDuringPark_COUNT	NUMBER_RepositionsDuringPark_COUNT
CONFIG_CycleTime_hours	60.5	72	72					
CONFIG_DescentToParkPresSamplingTime_seconds	10	0	0					
CONFIG_Direction_NUMBER	3	1	1					
CONFIG_InternalPressureCalibrationCoef2_NUMBER	-133	-133	-133					
CONFIG_ParkPressure_dbar	500	500	500					
CONFIG_PressureTargetToleranceDuringDrift_dbar	50	50	100					
CONFIG_PressureTargetToleranceForStabilisation_dbar	30	30	50					
CONFIG_ProfilePressure_dbar	2000	2000	2000					



Float page – Technical plots – HYDRAULIC

- *Targeted profile pressure not reached for alternate cycles (@700 dbar)*
 - *Decrease DescentSpeed after cycle 38*





Dashboard – Statistics – MISSING CYCLES

- Check the floats that have missing cycles
(difference between number of cycles and max cycle number)
- Under ice, not decoded, etc.

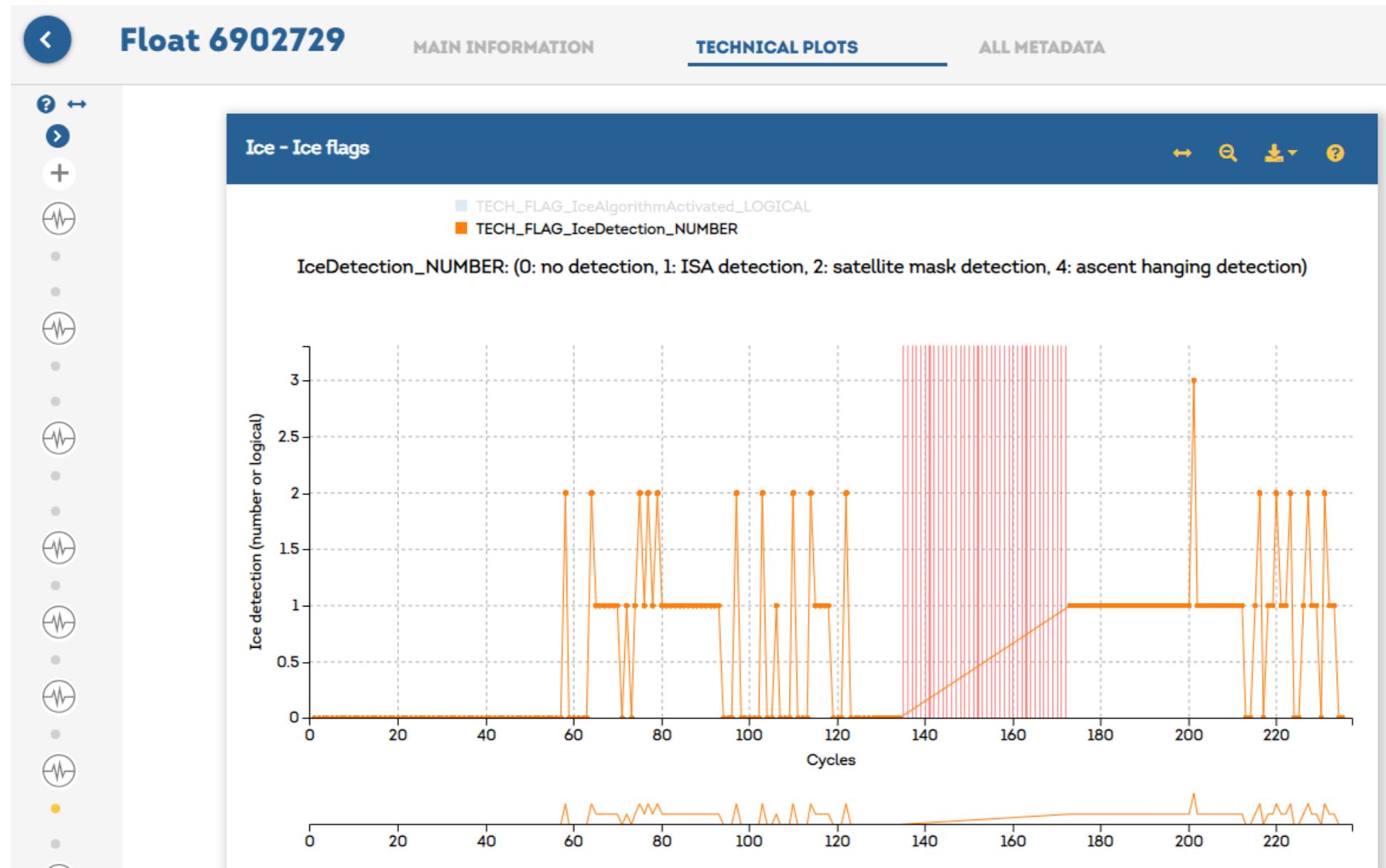
152 floats

	Nb floats	Nb cycles
+ CTD	6 3.95%	14 0.09%
+ FLAG_InvalidSalinity_LOGICAL	6 3.95%	7 0.05%
+ FLAG_InvalidTemperature_LOGICAL	2 1.32%	7 0.05%
+ Hydraulic	151 99.34%	6413 41.32%
+ FLAG_Park_ImmersionDriftOutTolerance_LOGICAL	147 96.71%	2593 16.71%
+ FLAG_ProfileMaxPressureAnomaly_LOGICAL	142 93.42%	2158 13.9%
- FLAG_MissingCycle_LOGICAL	13 8.55%	103 0.66%
	3901842 3901851 3901863 3901874 3901879 3901885 3901899 3901902 3901906 3901909 3901938 3901957 3901982	



Float page – Technical plots – ICE

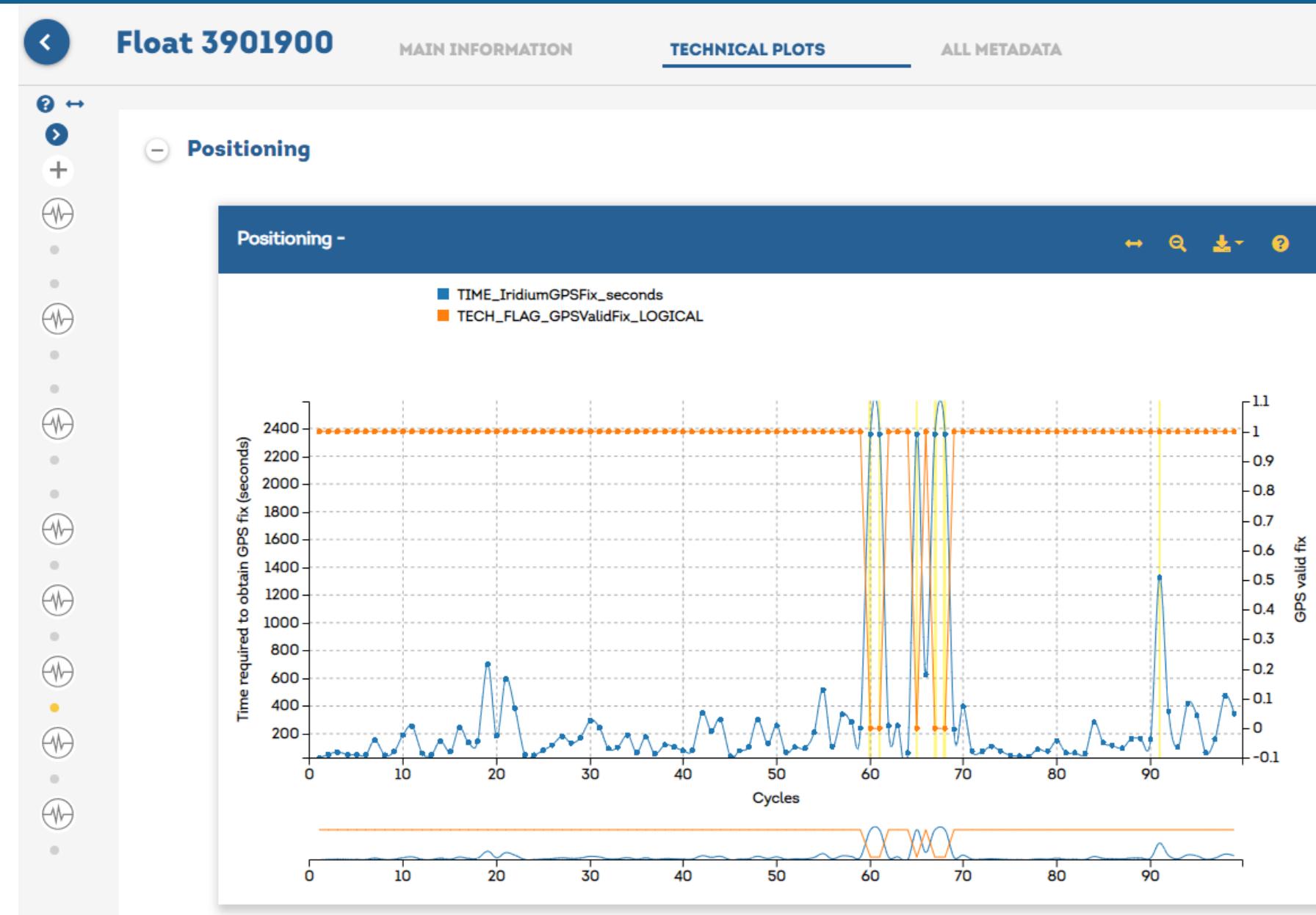
- *Ice detections*





Float page – Technical plots – GPS

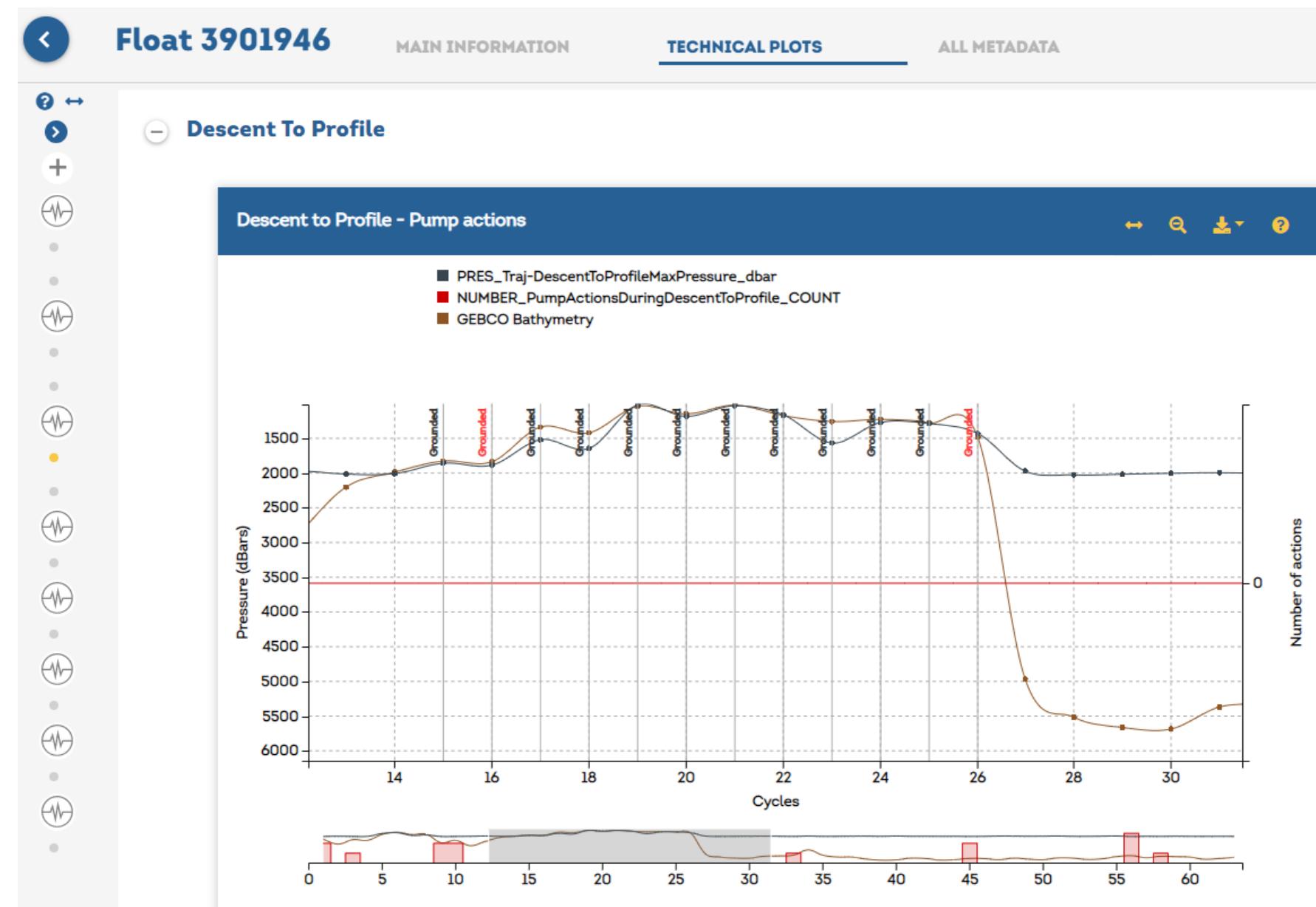
- *GPS valid fix*





Float page – Technical plots – GROUNDING

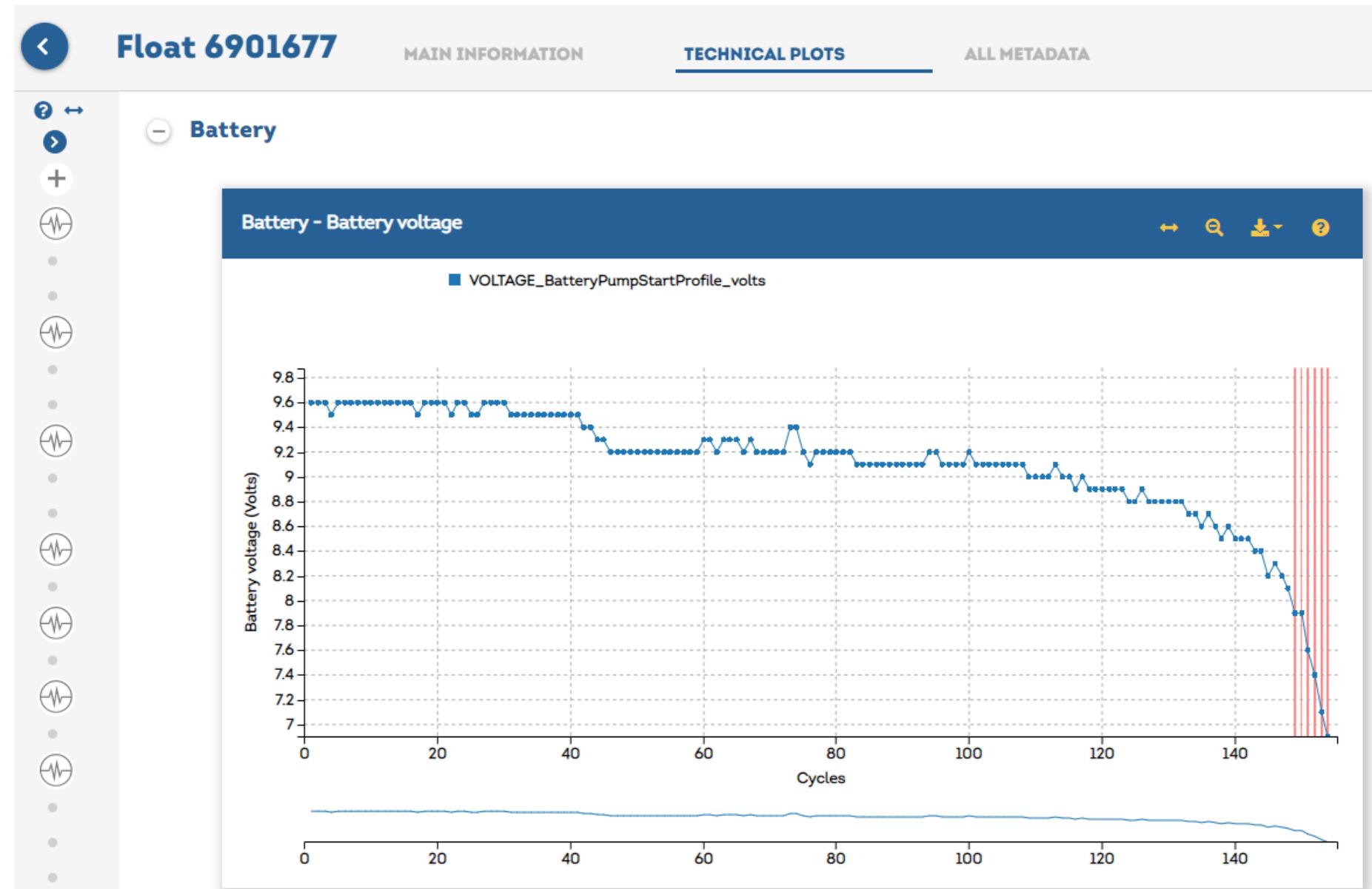
- By cycle phases





Float page – Technical plots – BATTERY VOLTAGES

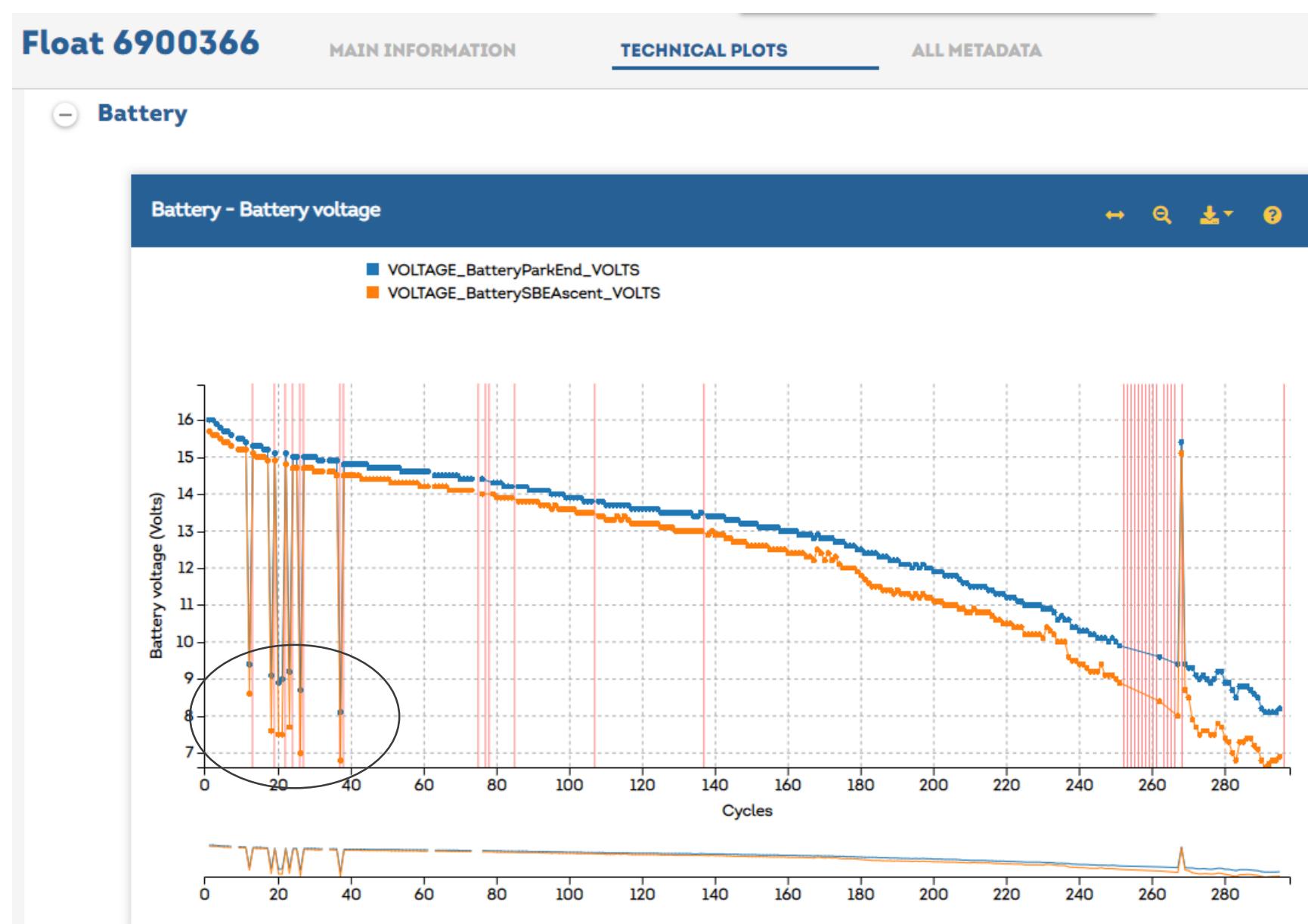
- *Below threshold*
- *Drop (difference x% compared to last cycle)*





Float page – Technical plots – BATTERY VOLTAGES

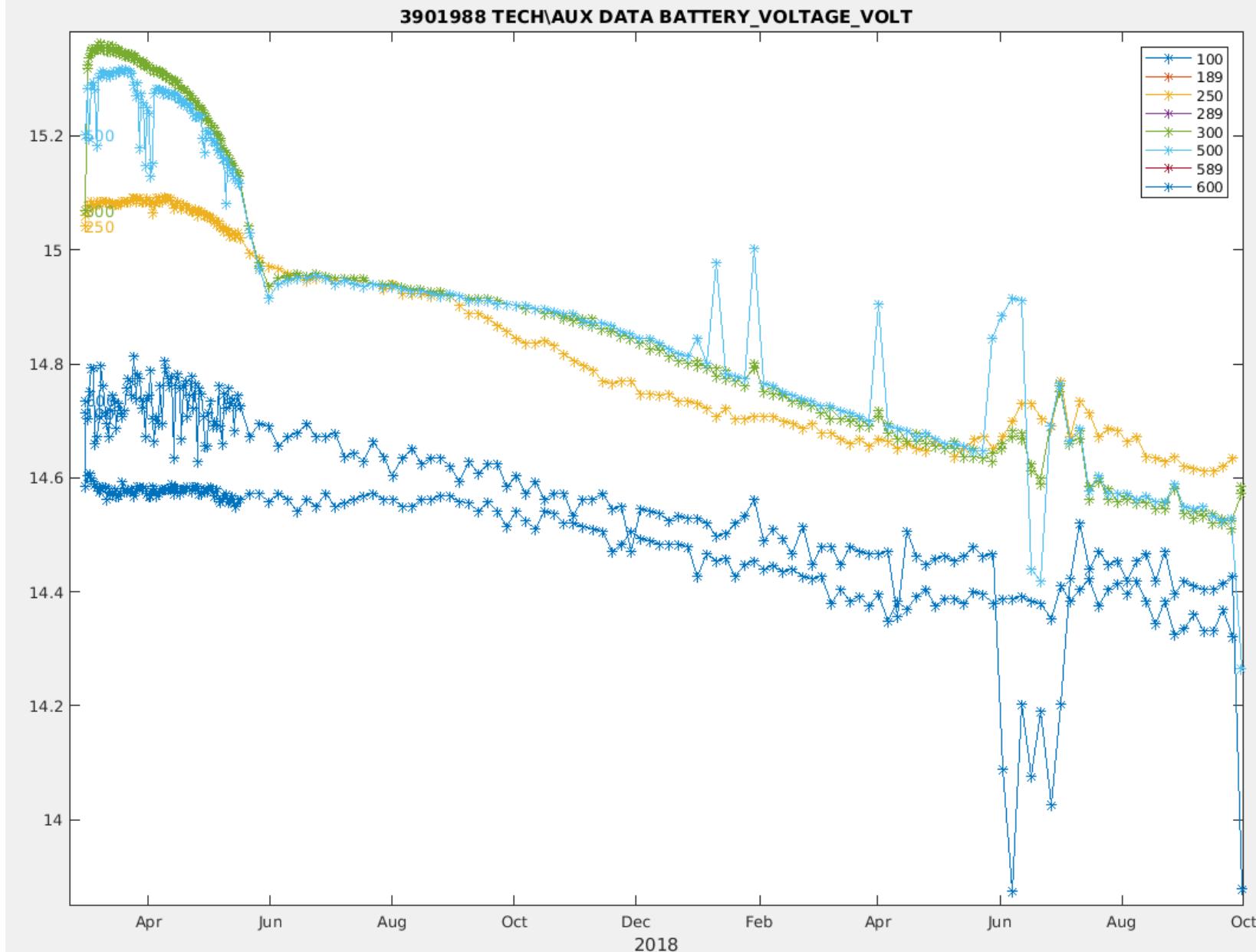
- APEX Alkaline





Float page – Technical plots – BATTERY VOLTAGES

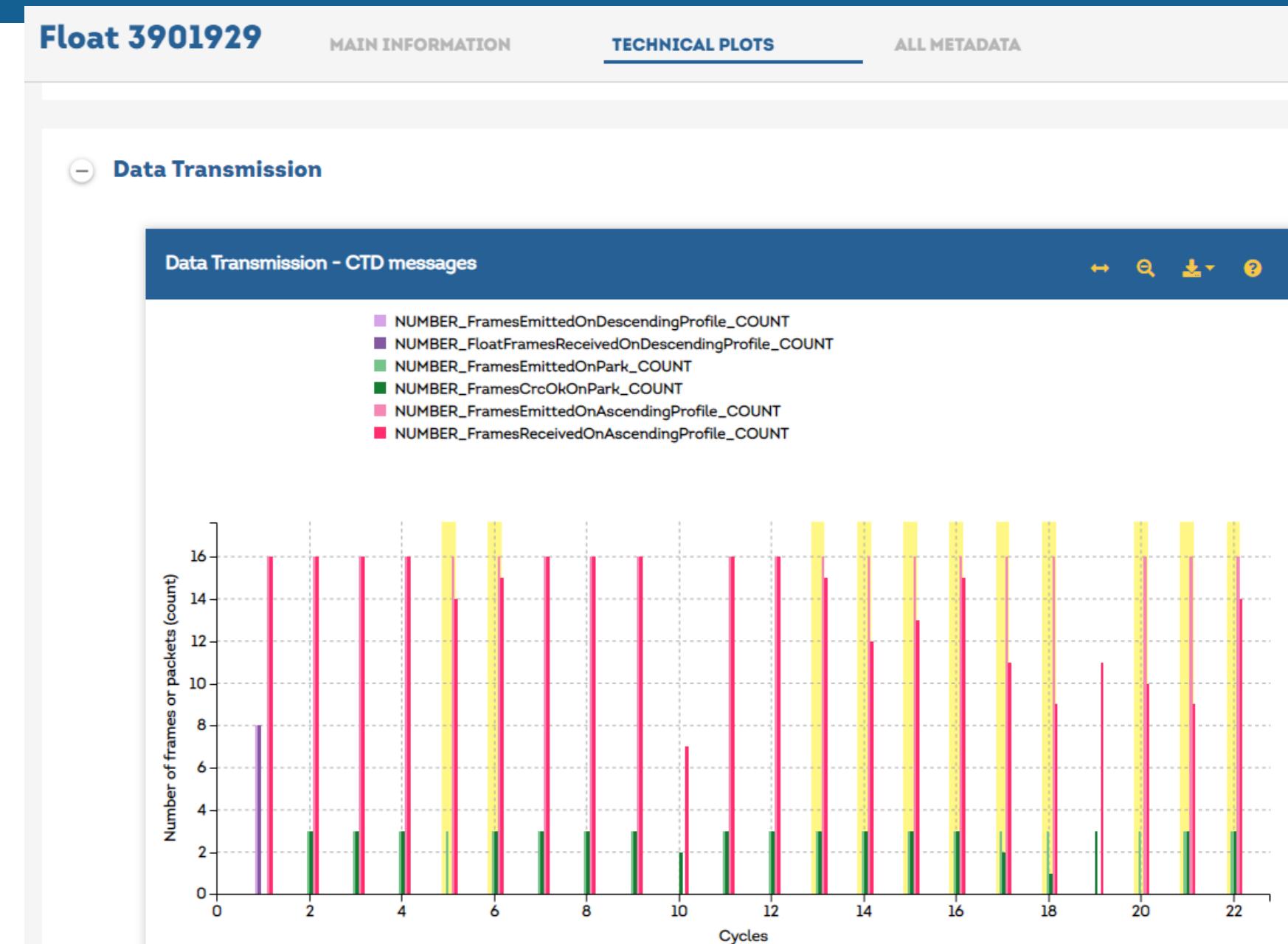
- Recent APEX floats (APF11)
- Battery voltages stored as timeseries
- Currently technical timeseries incompatible with Argo format...
How to deal with it?





Float page – Technical plots – DATA TRANSMISSION

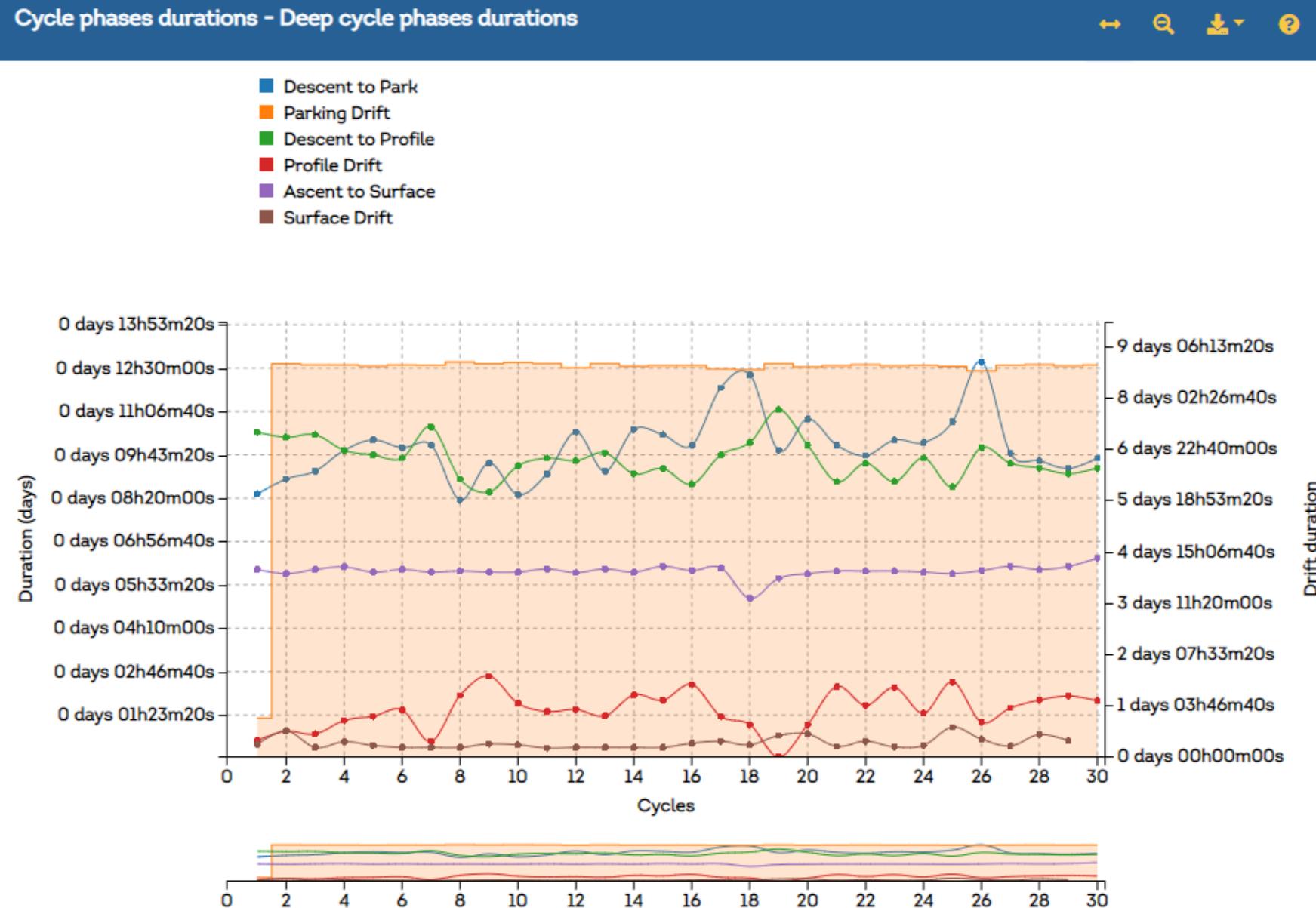
- ARGOS transmission problems
- Some packets sent by the float are not received on shore





Float page – Technical plots – DURATIONS

Durations of the different float cycle phases





Float page – Technical plots – ANY PARAMETER

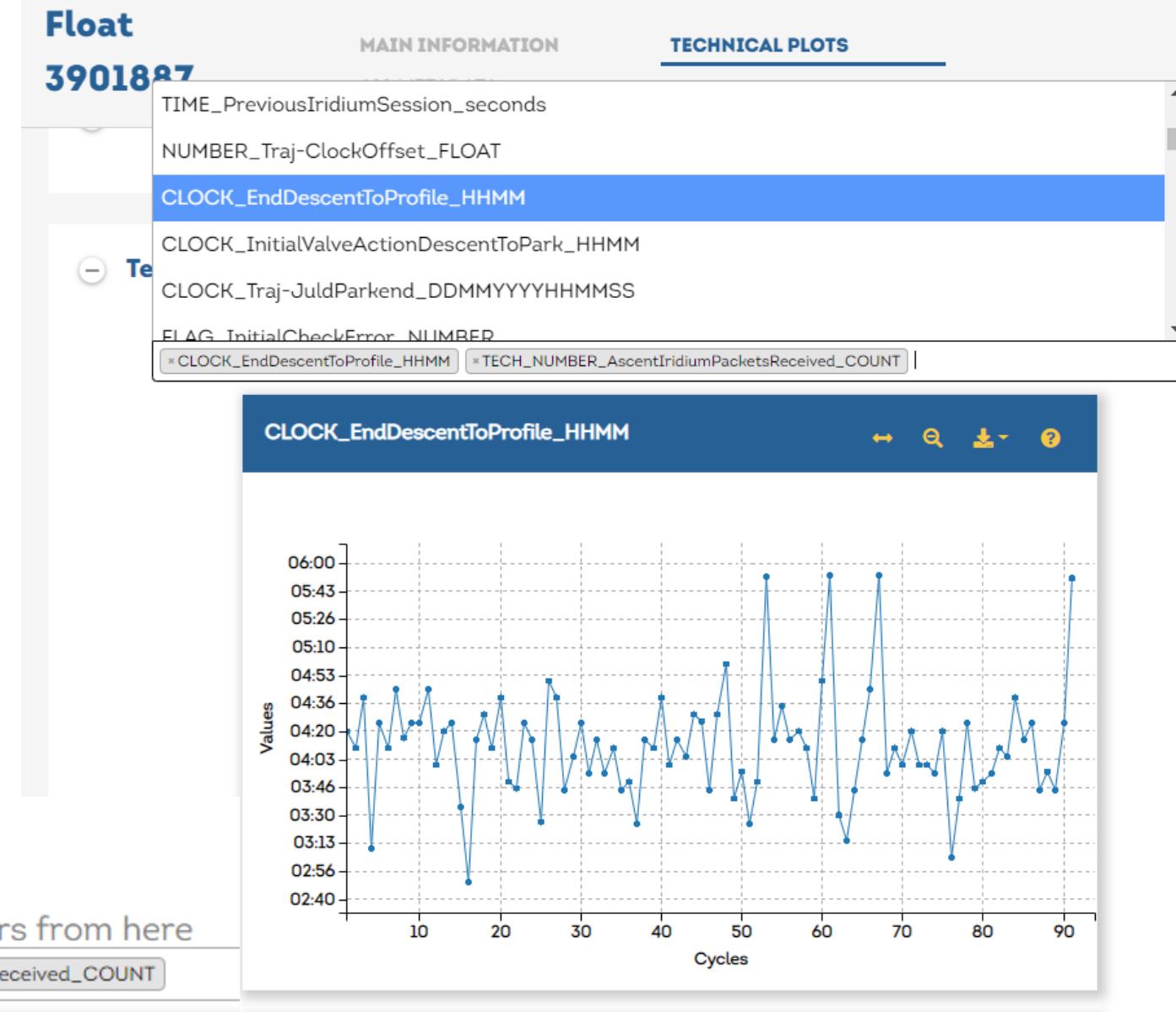
Plot any technical parameter

Technical Parameters

Select the technical parameters from here

CLOCK_EndDescentToProfile_HHMM

TECH_NUMBER_AscentIridiumPacketsReceived_COUNT





Conclusion on <https://fleetmonitoring.euro-argo.eu/>

- Some developments still to be done (bugs, etc.)
- Feedback (this WS, ADMT, Science Meeting, etc.)
- Working groups discussions
- Working groups to enrich the technical part of the website with information from other float types?

!!! Your feedback is welcome !!!



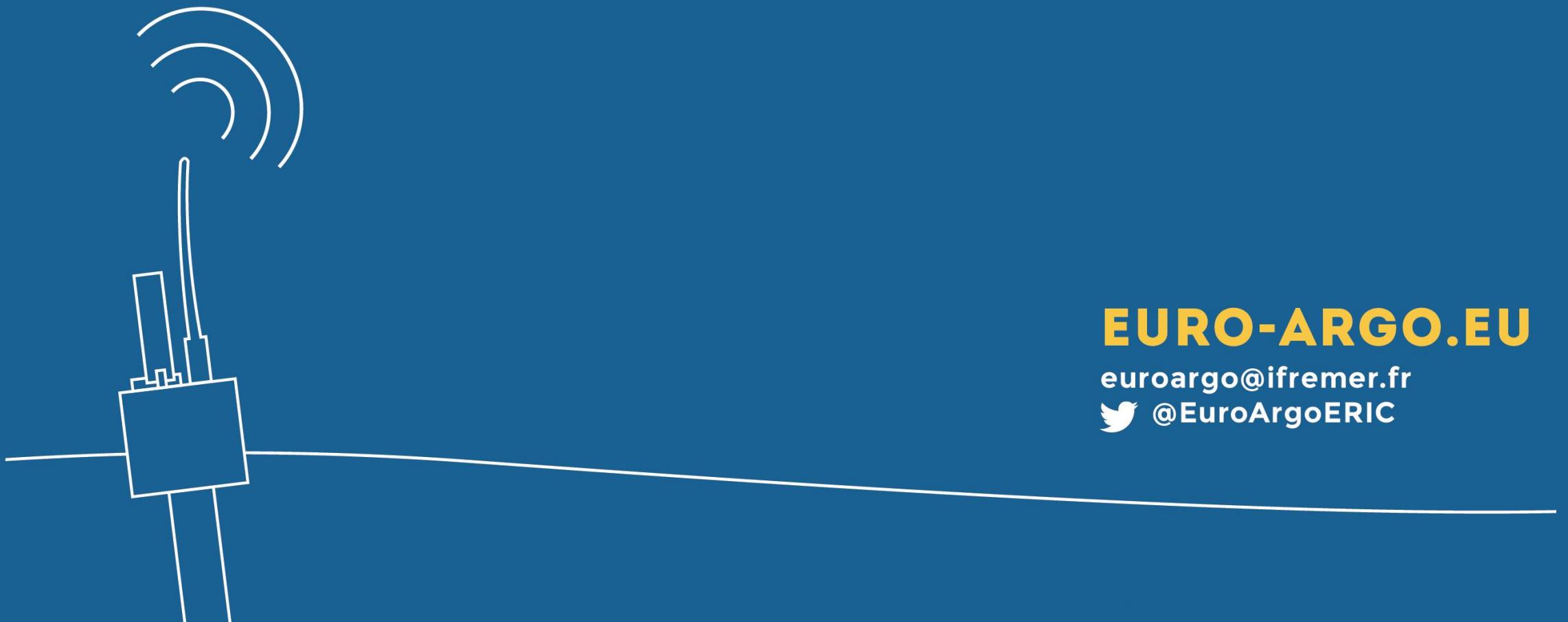
Monitoring Argo floats – Other tools

- AIC/JCOMMOPS
- Database
- GDAC
- Telecom provider + analysis of consumption
- NKE parser + Excel
- DAC tools
- Coriolis processing chain
- etc.



Further ideas/work?

- Improve life expectancy
- Standardised End Of Life report for every dead float



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 @EuroArgoERIC