Buoys data QC

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1.Life expectancy & Quality
2.Controls Check list
3. Actions synthesis
4. About recycling

baro life expectancy (days)
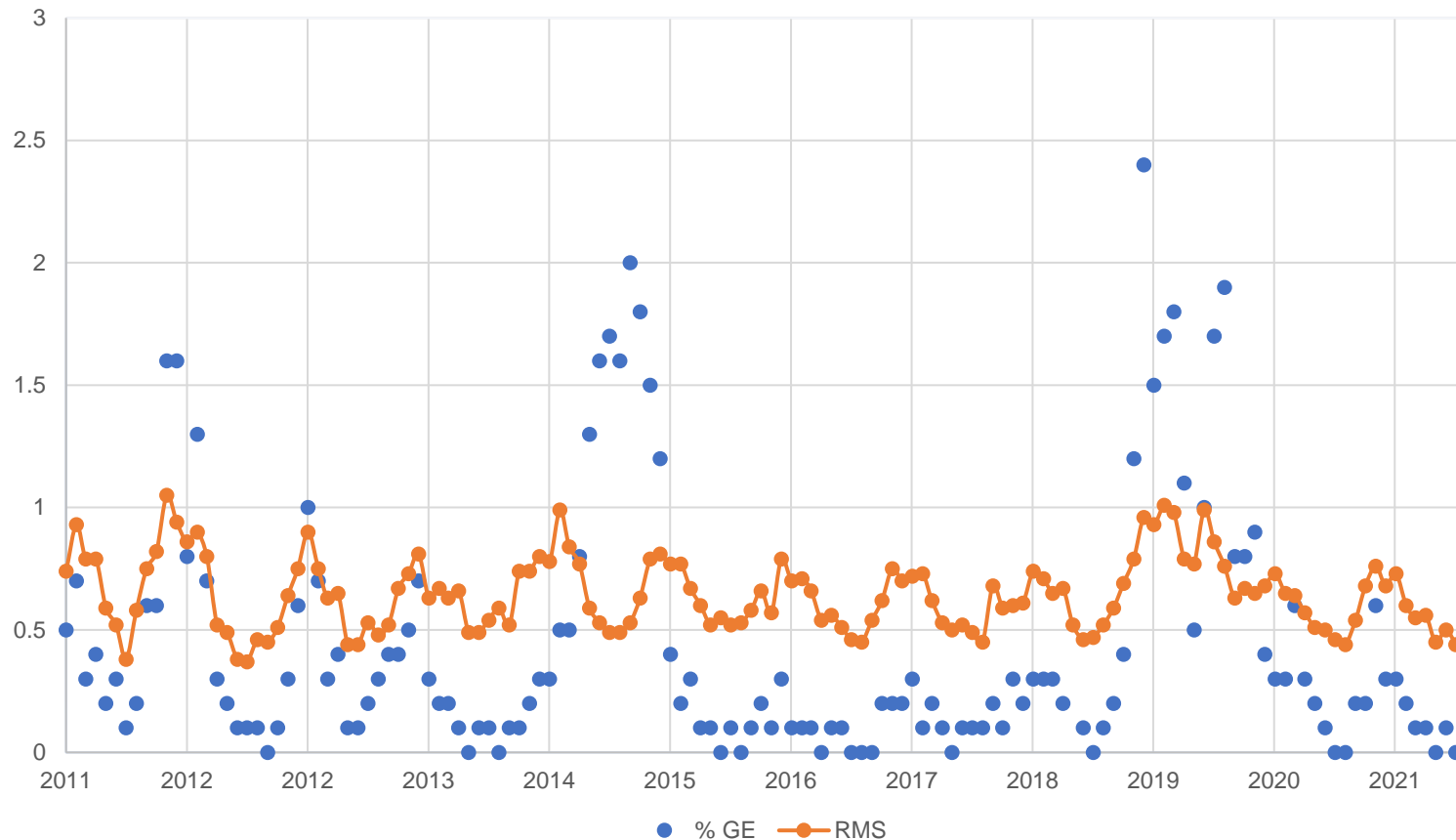mean and repartition 2011-2021
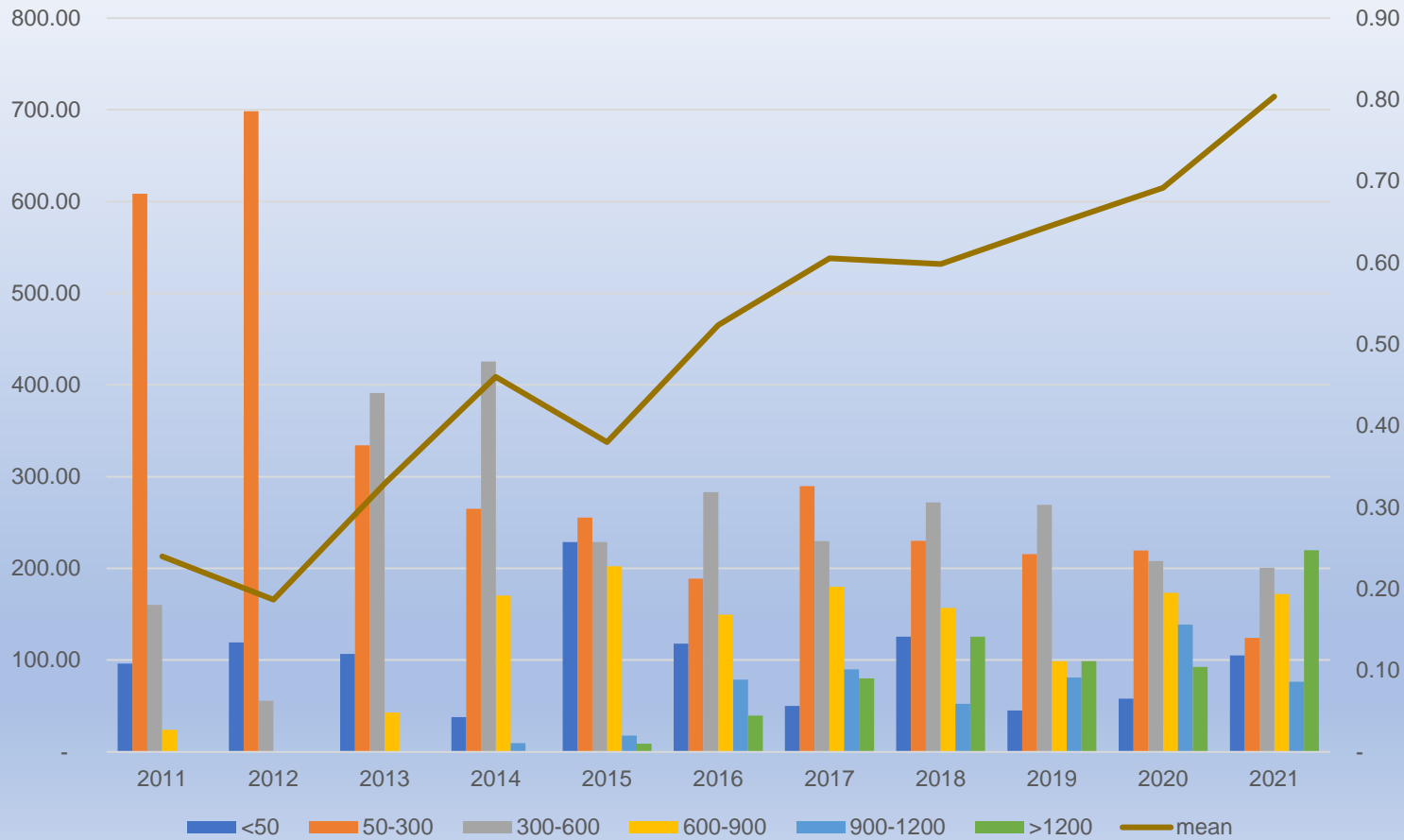
mean
6 different class
2011 - 2021

OBS :
Constant increase on mean

In 2021, high increase of
Population >1200 days life
expectancy

EXP:
Buoy Qty
Data QC

Sea Level Pressure Gross Errors and Root Mean Square Error
E Surfmar Buoys (North Atl and Mediterranea)

QC goals
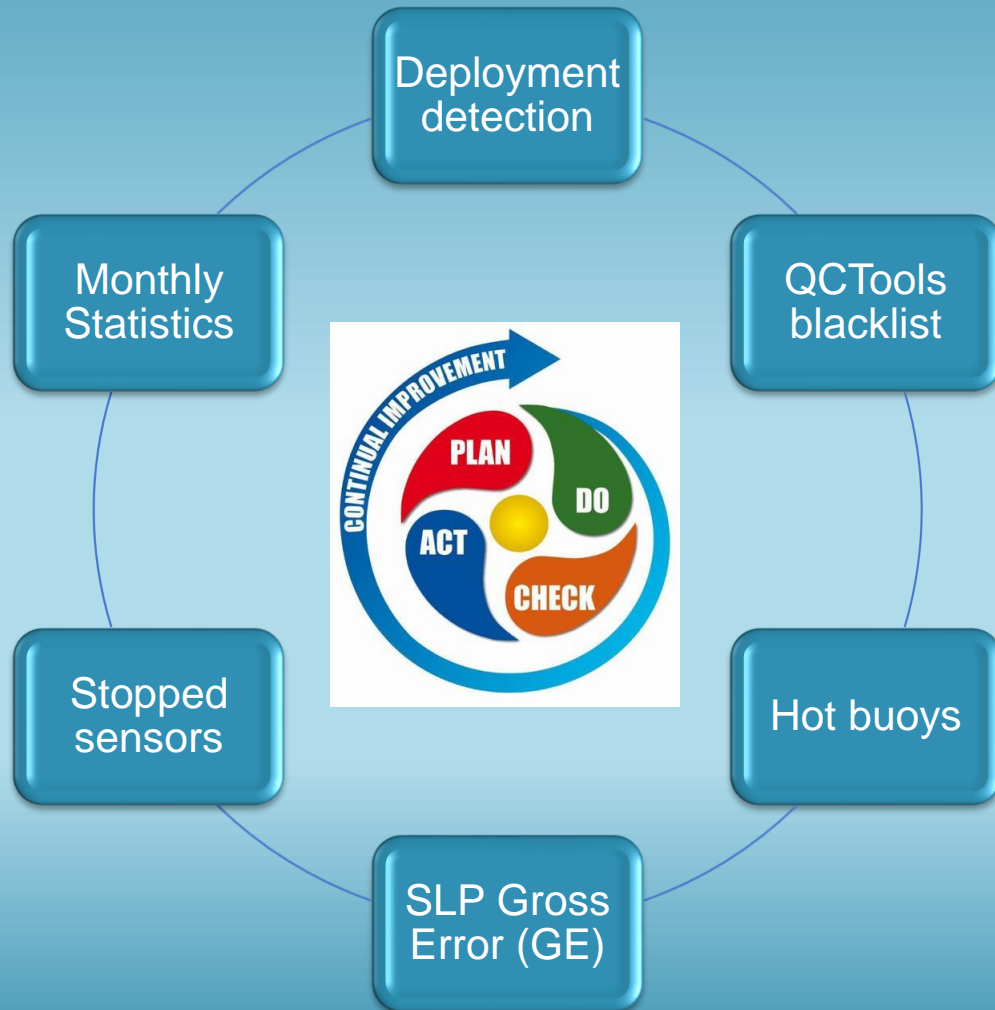Keep high level for data
%GE < 0,5%
RMS < 1,5

Means :
Tools improvement

SLP Gross Error : > 10 hPa

CONTROLS

Deployment detection

QCTools blacklist

Monthly Statistics

Hot buoys

Stopped sensors

SLP Gross Error (GE)

GOALS
+ Avalability
+ Quality

1.CONTROLS

- New deployment   Daily   auto
- e-surfmar SLP blacklist   Daily   auto
- All Other blacklist (SLP, SST, position, Ashore)   2/week   auto
- Hot Buoys (anomaly, land prox, …)   1..15 days   manual
- Individual SLP Gross Error evol   weekly   auto
- Stopped sensors   weekly   manual
- Statistics comparison data/model   monthly   auto(octopus)
- Buoy review   monthly   auto

New deployment detection

- Daily automatic detection based on IMEI of stored or in board buoys

Limits : Iridium TRS has to be activated

CONTROLS - QCTools Blacklists

https://esurfmar.meteo.fr/qctools/

Daily update
(except SST -> weekly)

Hot Buoys

Buoy life is not a long, quiet river

Manual control when a buoy deserve a special attention :

- Land prox
- Intermittent data anomaly (SLP, SST, GPS)
- Iced
- Bias correction …

Example : buoy # 6301572
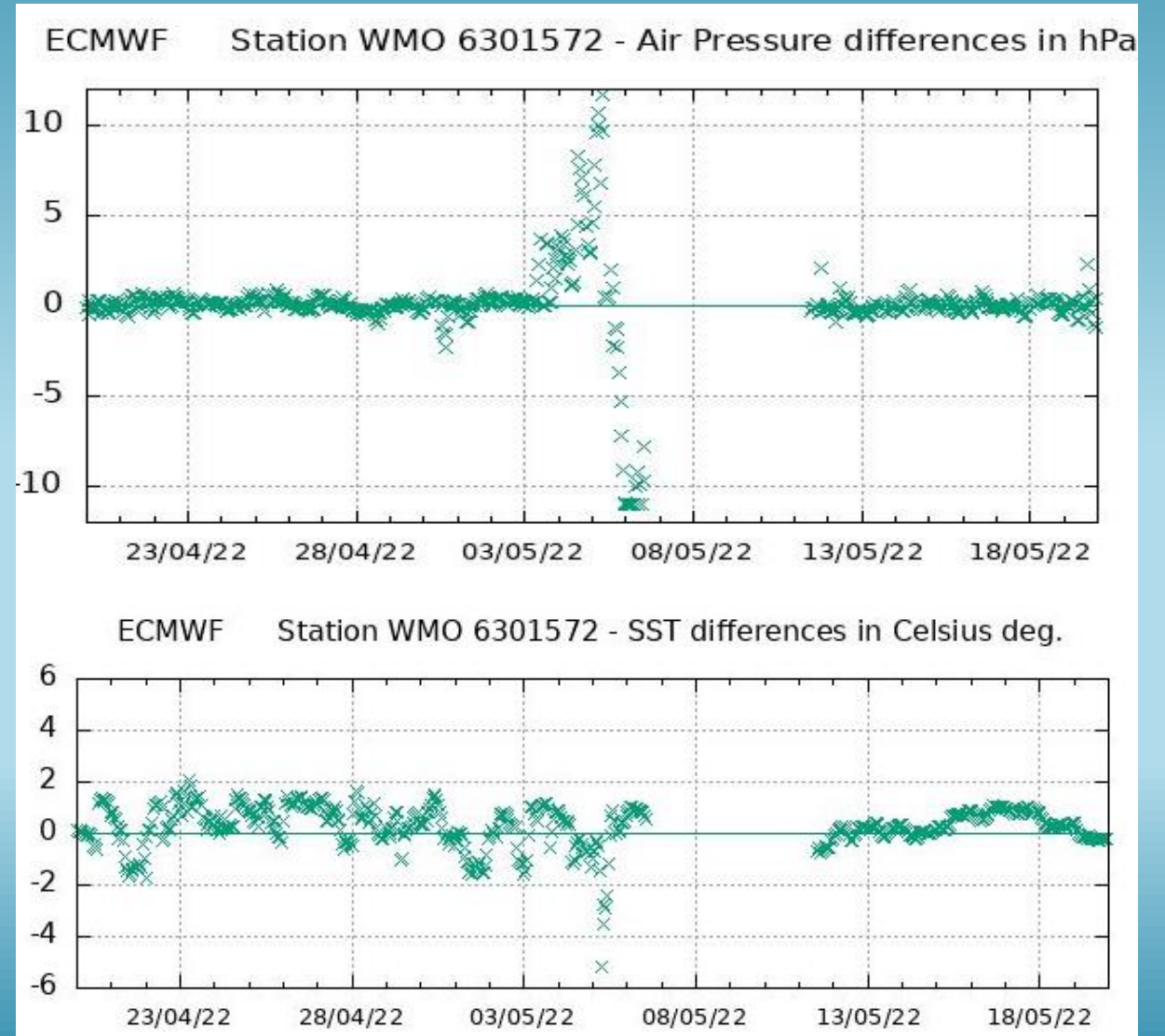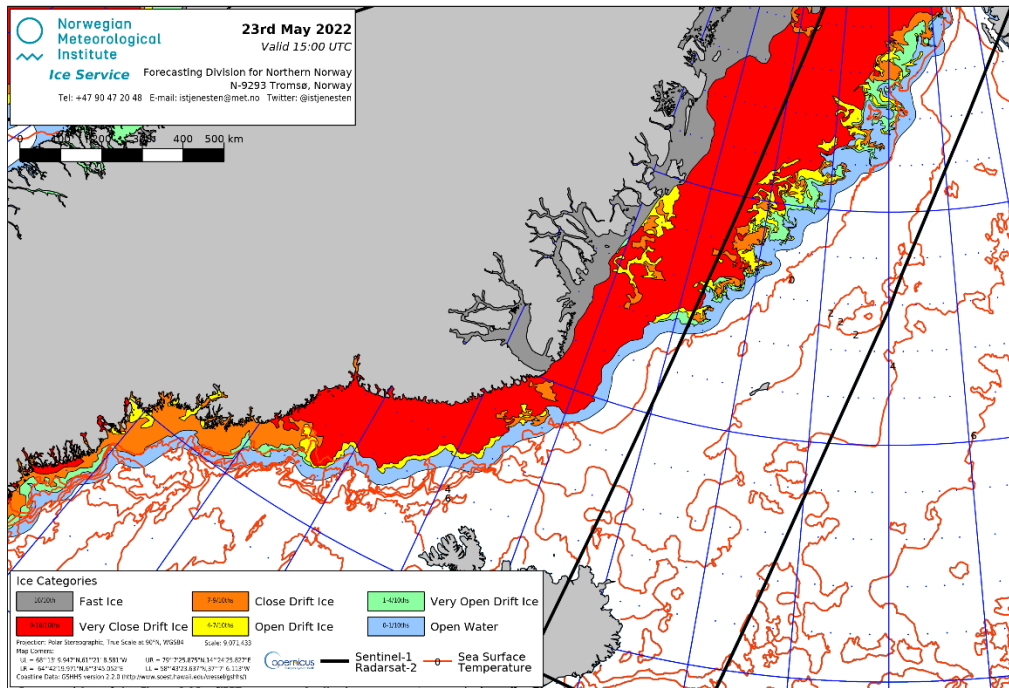
Land proximity

case # 4101842
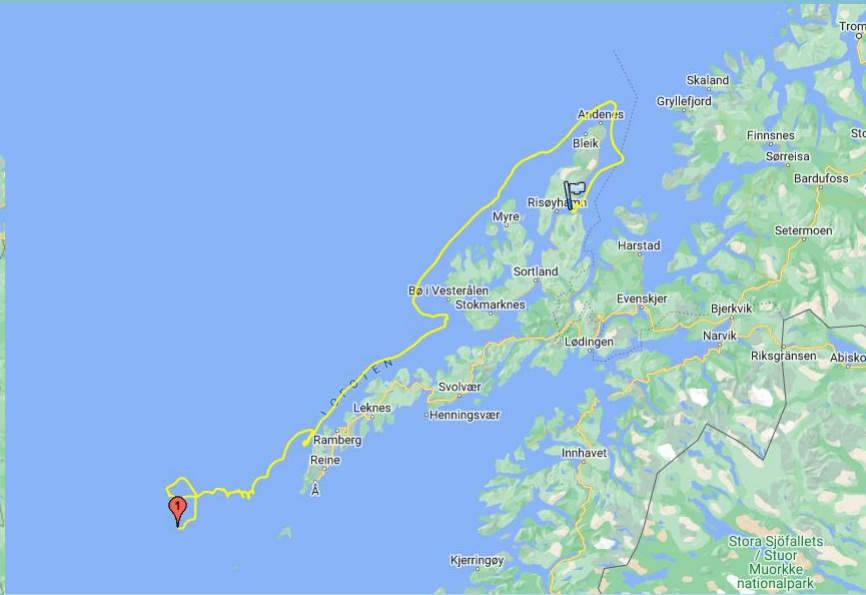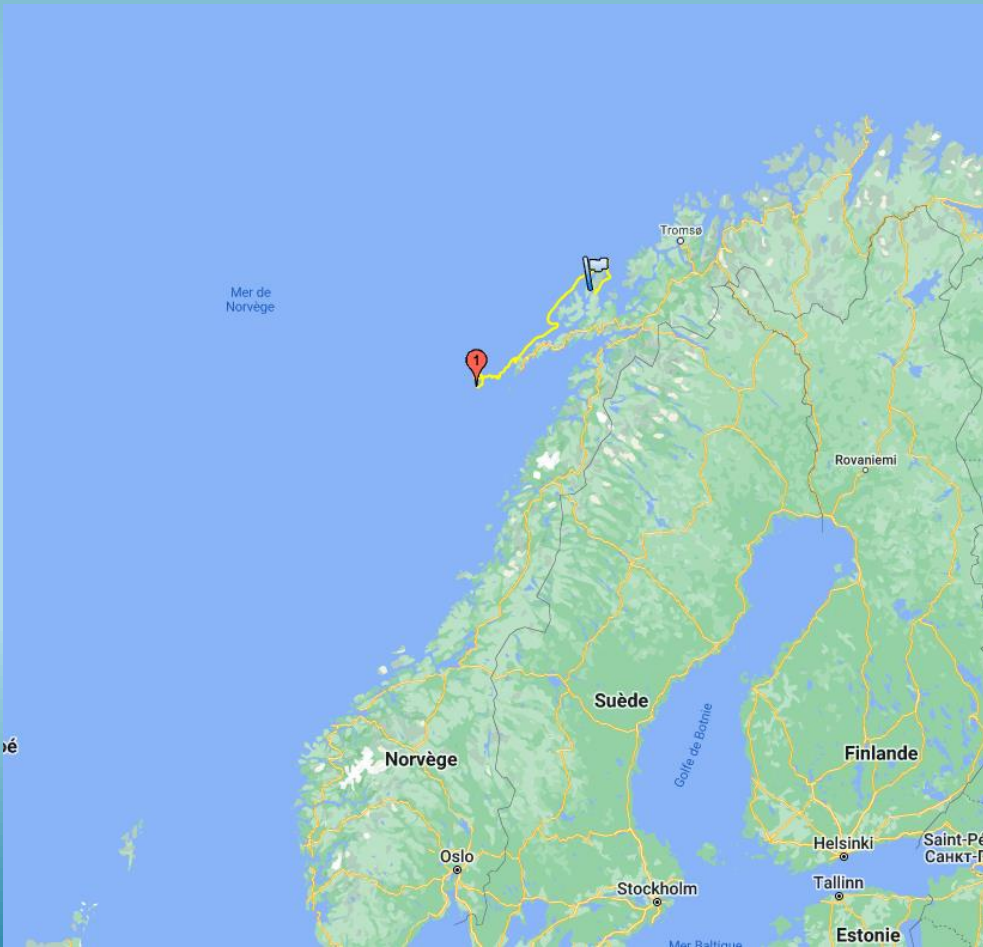
SLP Bias correction

(according DBCP technical document N°37)
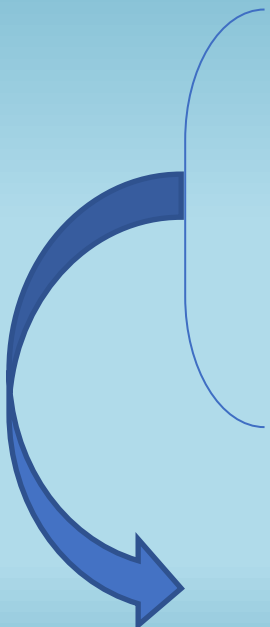
Detect Bias with blacklist and monthly statistic

Evalutate faisability and and apply correction

Periodic check (accuracy of correction and evolution)

SLP Bias correction

Detect Bias with blacklist and monthly statistic

- Daily update of QCTools SLP E-surfmar blacklist
  Gross error - <u>bias</u> – std / RMS

- Monthly update of QCTools comparison score with Meteo France
  and ECMWF model

Studies of buoys with a bias greater than 0,5 hPa

SLP Bias correction

Evalutate faisability and and apply correction
Periodic check

- Check the variability :
  - Constant bias over a week
  - Acceptable standard deviation (<1,5)

- Bias correction applied before GTS insersion

- Periodic check (hot buoys)
  - in the following days to check correction accuracy
  - in the following weeks to control an eventual degradation

SLP Bias correction

Bias — Station WMO 4401854 - Air Pressure (hPa)
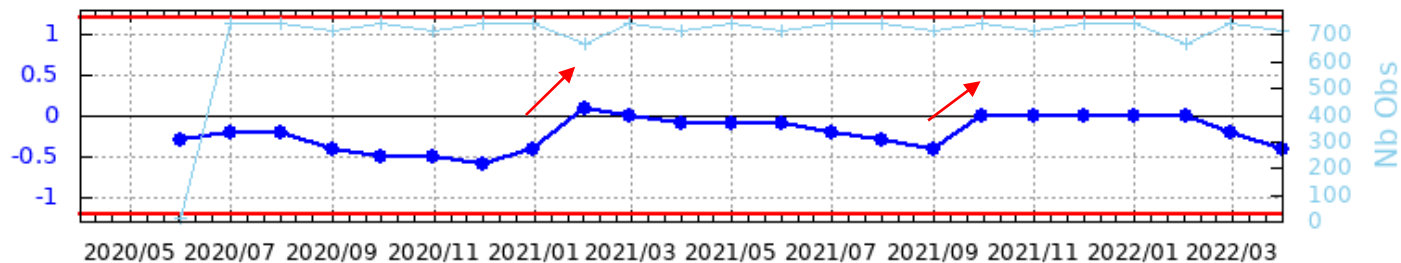
Standard Deviation — Station WMO 4401854 - Air Pressure (hPa)
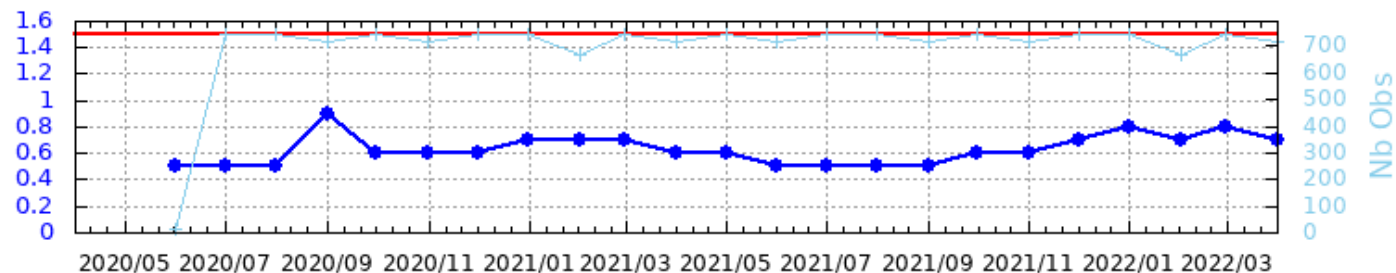
RMS — Station WMO 4401854 - Air Pressure (hPa)

Date	Corr	Tot
21/01/21	+0,7	+0,7
18/09/21	+0,5	+1,2
19/5/22	+0,8	+2,0

SLP Bias correction

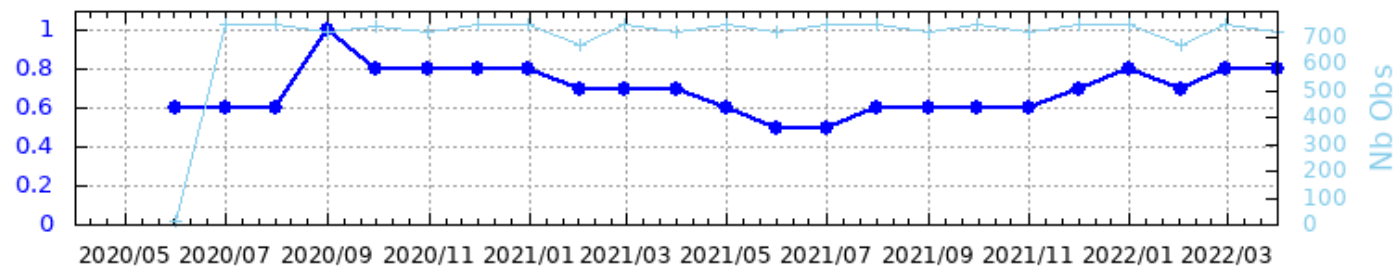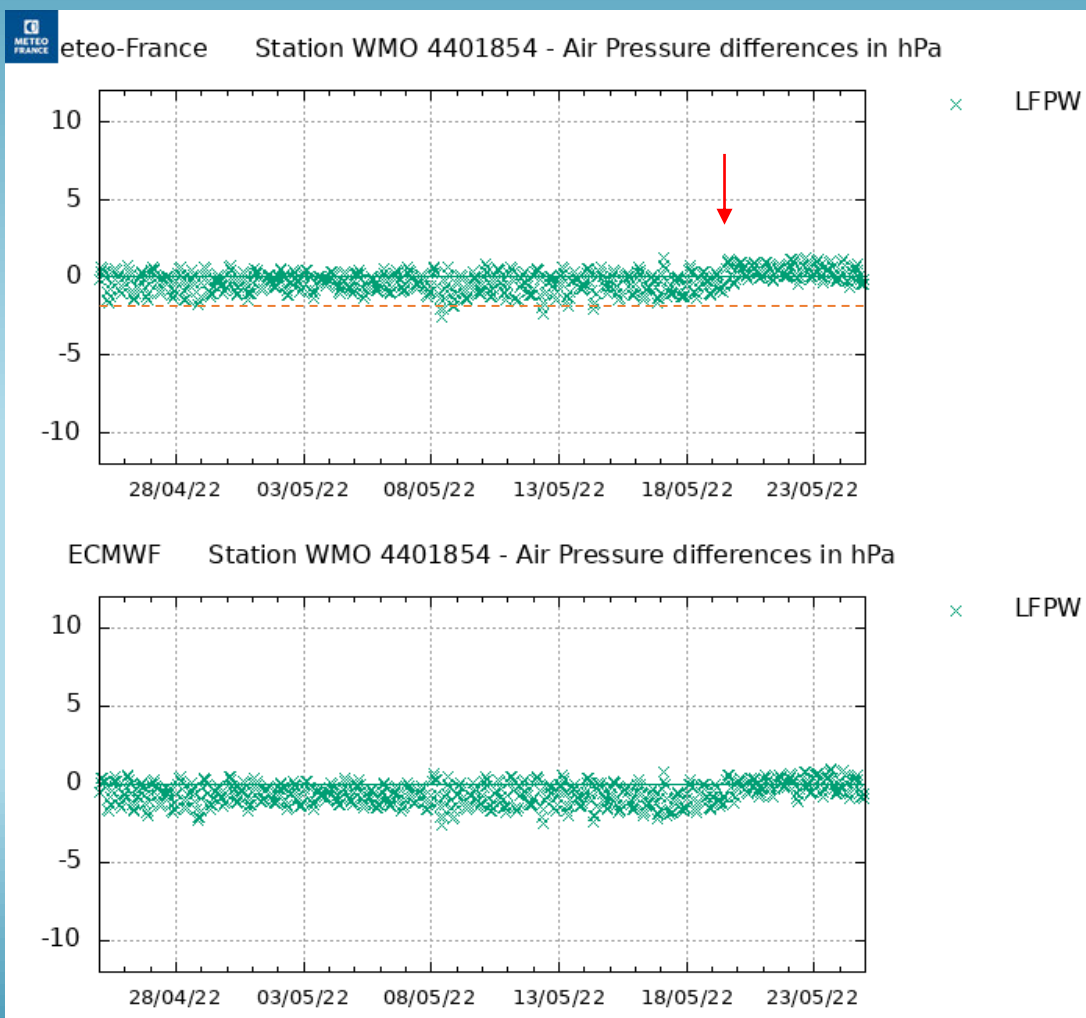| Date	Corr	Tot
21/01/21	+0,7	+0,7
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SLP Bias correction
summary

Today 35 e-surfmar drifter have a bias correction on 124 buoys broadcast by CMM :   28%

7 have more than 2 corrections   :   5%

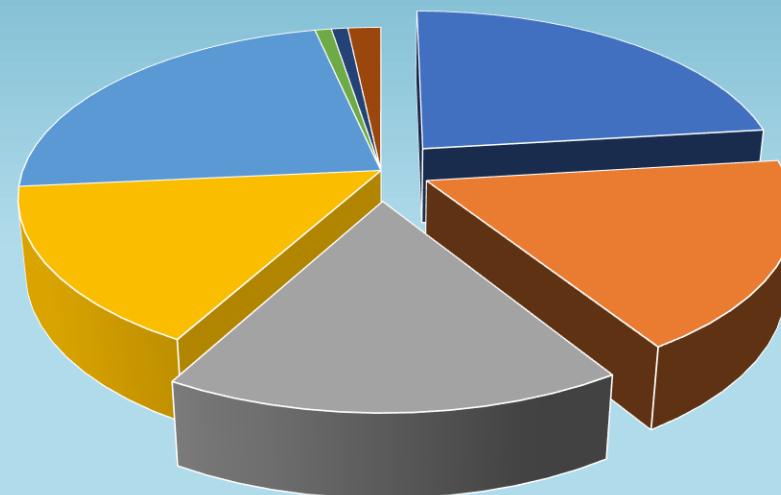Mean bias of Buoy with 1-2 corrections   :   0,7 hPa

Advantage : improve data quality and sensor life expectancy

Perimeter : only buoys broadcast by CMM

2.QC actions in 2022

2/3 done to improve SLP quality and on GTS and life expectancy of barometers :
- stopped (GE/std/bias)
- bias correction
- revalidated

2022 E-surfmar QC event

Legend:
- ■ P stop (GE, std)
- ■ P bias
- ■ P return
- ■ Ashore
- ■ drogue (not ashore)
- ■ sst stop (GE, std)
- ■ sst return
- ■ GPS error

Collect & recycling

Goals
- Reduce plastic pollution
- Optimize buoy's life expectancy -> reduce cost and carbon footprint

Status
- 2 collect & re deployment (Spain, Germany)
- 5 recovery action successful (Germany, Netherlands, Ireland, Spain, Australia)

Evolution
Generalize these action based on goodwill of participants
No buoys recovery in 2021 -> lot of room for improvement

Buoys data QC

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