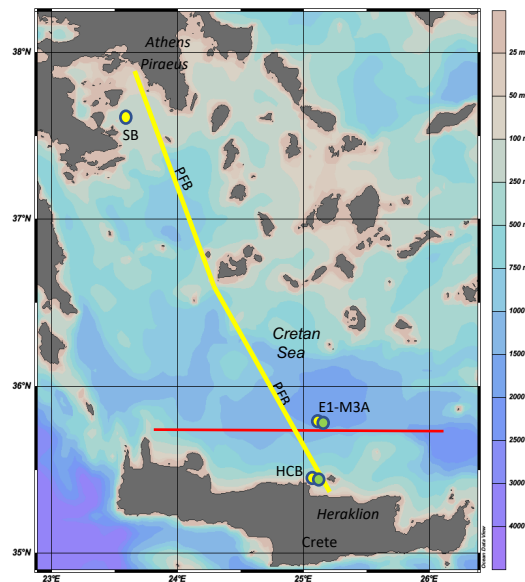


# FerryBox activities in the Aegean Sea (Eastern Mediterranean)



*C. Frangoulis, on behalf of  
POSEIDON Team,  
Institute of Oceanography,  
Hellenic Centre for Marine Research*

## *FerryBox activities in the Aegean Sea (Eastern Mediterranean)*

- Brief history
- Current status
- Future plan
- Data management
- Some applications
- Lessons learned

# History of POSEIDON Ferrybox (PFB)

## Model:

4H- JENA engineering GmbH

## Route

Piraeus –Heraklion

Piraeus –Souda (Chania)

mostly during night

7 hours trip (speed > 20 knots).

## Projects using PFB

- FerryBox (FP5 EU)
- JERICO (FP7 EU)
- JERICO-NEXT (EU H2020)
- JERICO-S3 (EU H2020)
- CLAIM (EU H2020)
- EUROSEA (EU H2020)
- HIMIOFOTS (national RI, ended in 2021)
- MARBEFES (EU 2020)
- OBAMA-NEXT (EU 2020)

## TNA Projects using PFB

- JERICO-NEXT - CarbonAS



2003-2004

“Kriti II”



2012-2014

“Olympic Champion”



2017-2021

“Festos Palace”



2022-....

“Blue Horizon”



# Current status POSEIDON Ferrybox (PFB)

Reinstallation almost completed, expected to provide data by November 2022



High-Speed Ferry covering the distance every night in 7 hours (speed > 20 knots), Piraeus-Heraklion



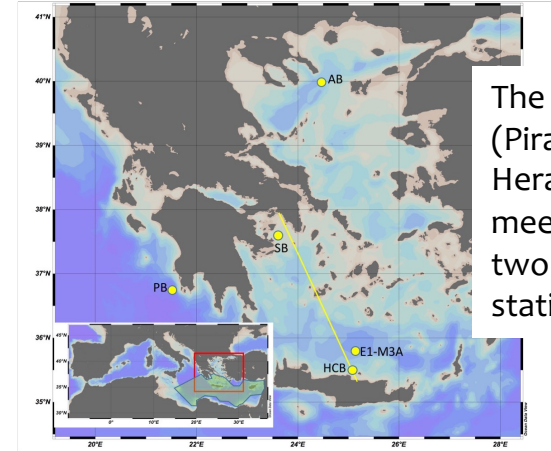
Temperature-Conductivity (SBE45)



Fluorescence-Turbidity (Scufa II Turner Design)



Dissolved Oxygen (Aanderaa optode)



The FB route (Piraeus – Heraklion) meets ~~three~~ two Poseidon stations/buoys.

## recent upgrades

CO<sub>2</sub> sensor (SubCtech)



Water Sampler (Teledyne)



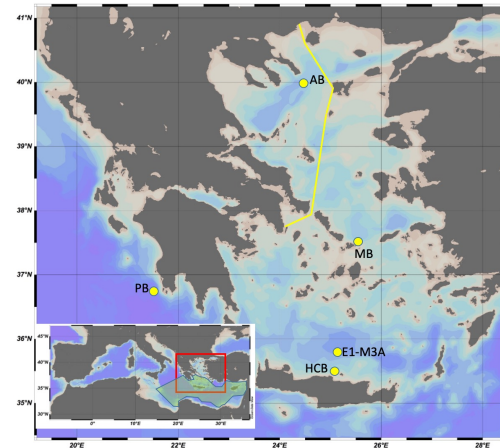
SBE temperature (SBE) sensor at start of water circuit



# POSEIDON Ferrybox (PFB) future plans : N. Aegean Sea



Ferrybox acquired  
but...  
up to now dead-end  
with 2 ship companies  
(i.e. two ferry ships)  
for technical  
reasons on each ship



The FB route  
(Piraeus –  
Heraklion) will  
meet one  
Poseidon buoy.  
(?)

OceanPack AUMS SubCtech



# Data management procedures

Ferrybox PFB (SAEG01)

Data flows handled by CMEMS In Situ Thematic Assembly Center (INS TAC)

## Quality control procedure

✓ : used for POSEIDON FB

### ***EuroGOOS Data-MEQ Recommendations for RTQC procedures\_V1.2 (Ferrybox)***

- ✓ RTQC1: Platform metadata check
- ✓ RTQC2: Impossible date test
- ✓ RTQC3: Impossible location test
- ✓ RTQC4: Frozen date/location/speed test
- ✓ RTQC5: Speed range test
- ✓ RTQC6: Pump or flow-meter test  
(PFB: valve filter test)
- ✓ RTQC7: Pump history test  
(PFB: ship outgoing test)
- ✓ RTQC8: Global range test
- ✓ RTQC9: Regional range test  
(PFB: adapted to sub-regional range test)
- ✓ RTQC10: Gradient test (includes spike test)
- ✓ RTQC11: Frozen test

### **QARTOD**

Group 1 Required

- ✓ Test1: Gap Test
- ✓ Test2: Syntax test
- ✓ Test3: Location test
- ✓ Test4: Cross Range test
- ✓ Test5: Climatological Test

Group 2 Strongly Recommended

- ✓ Test 6: Spike test
- Test 7: **Rate of Change test**
- ✓ Test 8: Flat Line test

Group 3 Suggested

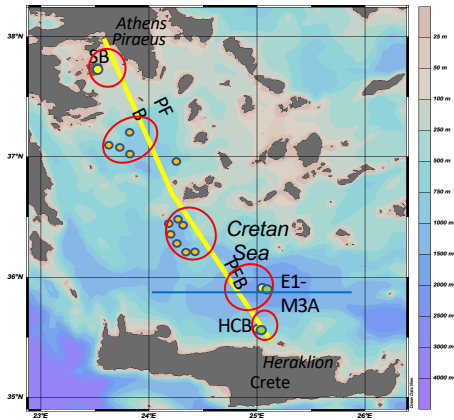
- Test 9: Multi-Variate Test**
- Test 10: Attenuated Signal Test
- Test 11: Neighbor Test**

*QC under development*  
**Rate of change**  
**Neighbor Test**  
**Multivariate test**

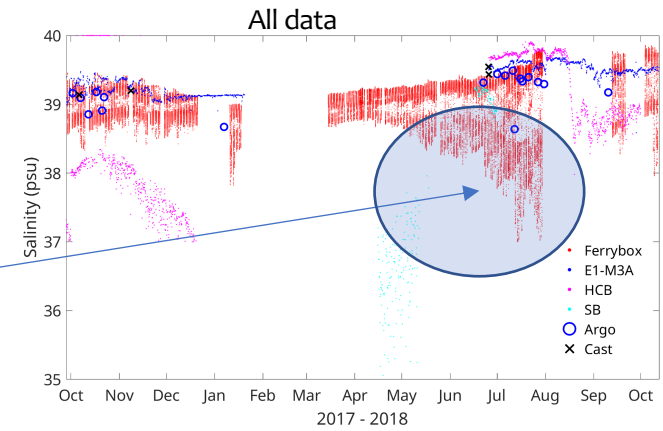
# POSEIDON Ferrybox (PFB) –some applications

QC by neighbor test

From Frangoulis et al. 9th FB Workshop

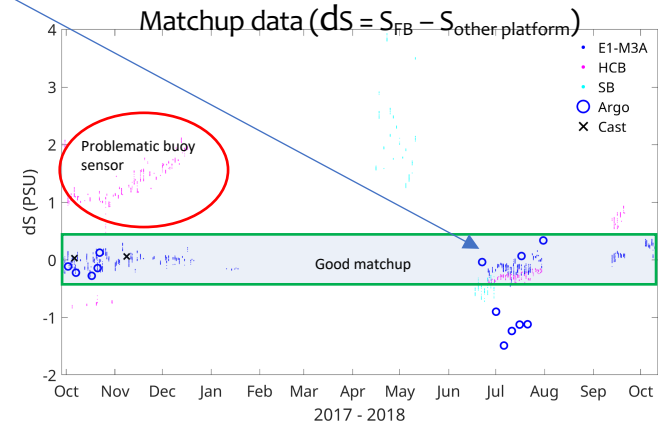
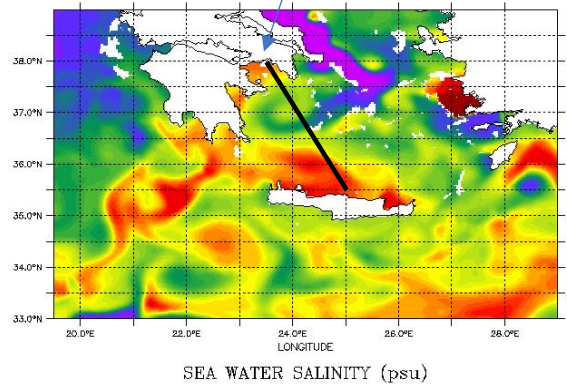


- Argos
- Buoy
- RV (CTD)
- Ferrybox
- Glider
- Matchups for neighbor test



FB Sensor problem?  
 No. E1-M3A, HCB, Argo data confirm FB is ok.  
 ⇒ Model shows water mass with lower salinity (Black Sea Water) entering the Cretan Sea

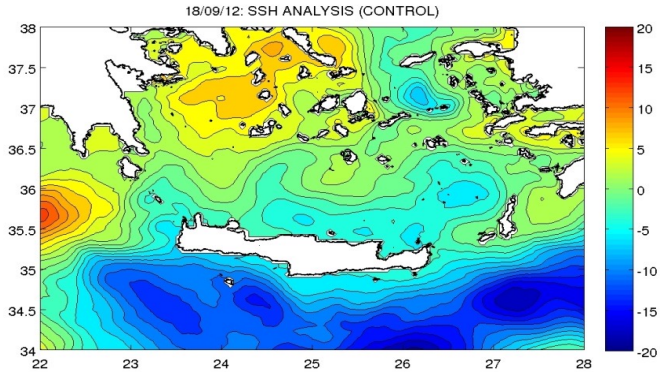
DEPTH (m) : 5  
 TIME : 15-AUG-2012 00:00  
 DATA SET: AEGEAN: 3D Hydrodynamical Forecasts (POM)-Nested to MERSEA Med forecast



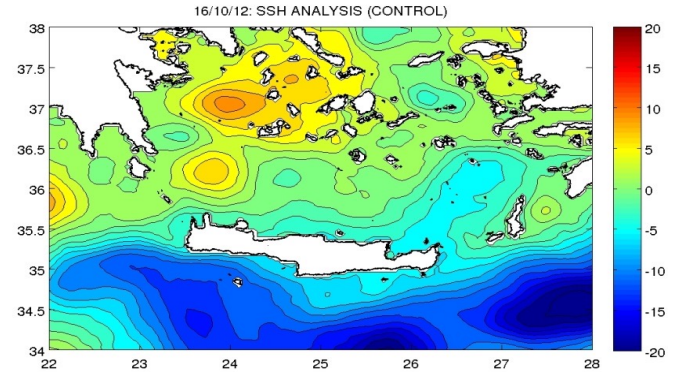
# POSEIDON Ferrybox (PFB) –some applications

PFB Data assimilation

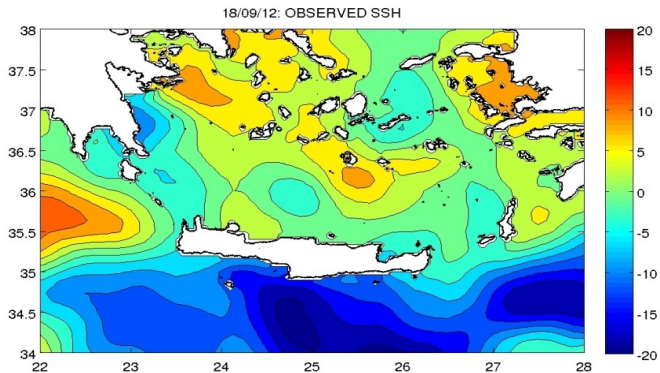
From Korres et al. 2014 JMS



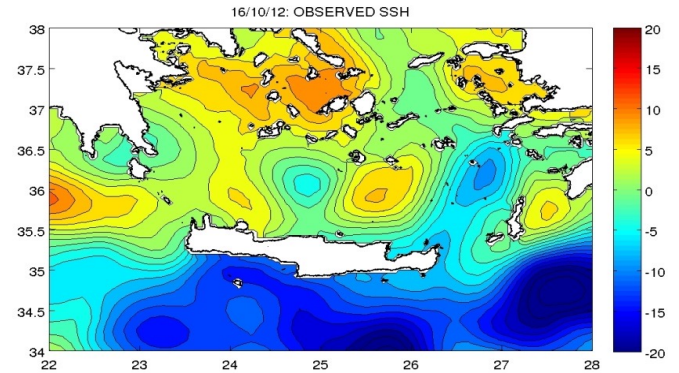
**SSH model**  
*(without FB data assimilation)*



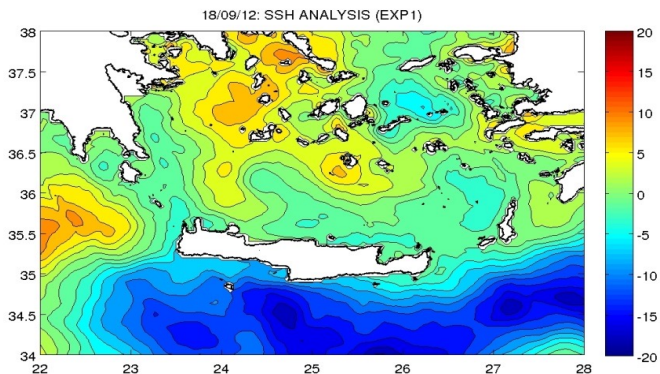
18.09.12



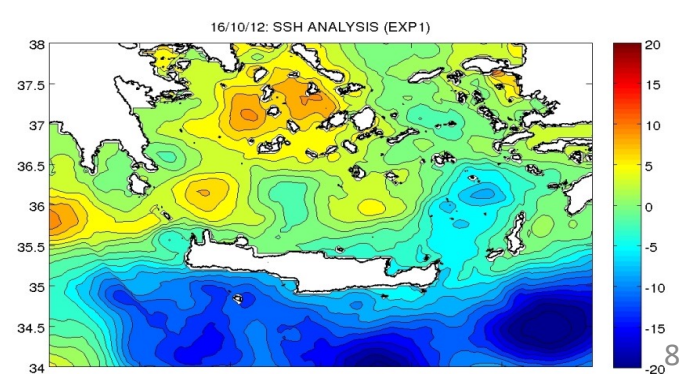
**SSH OBSERVATIONS**



16.10.12



**SSH model**  
*(+FB SST assimilated daily)*





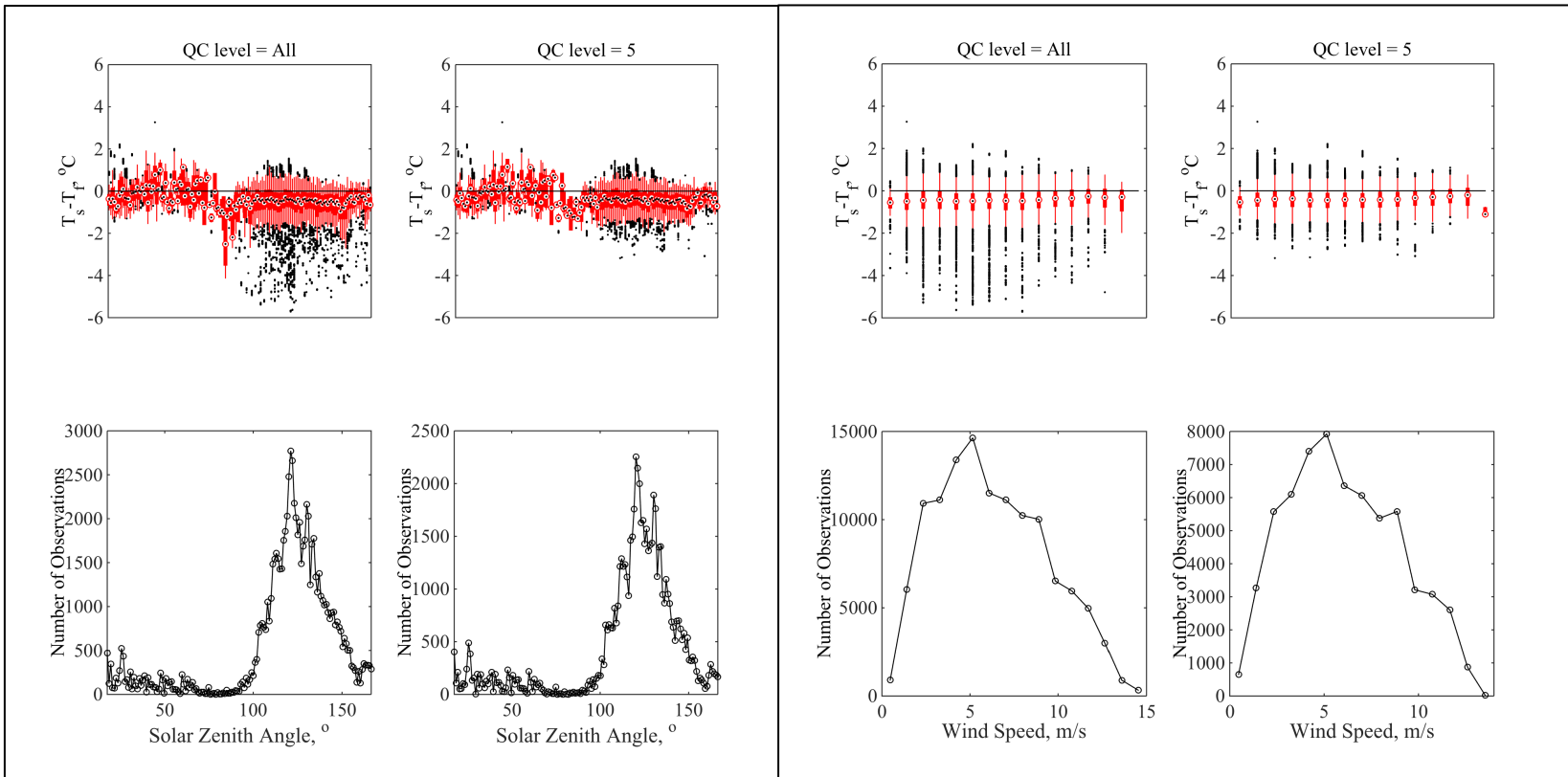
# POSEIDON Ferrybox (PFB) –some applications

Validation of satellite derived SST

From Potiris et al. 7th FB Workshop

$\Delta T$  vs SZA

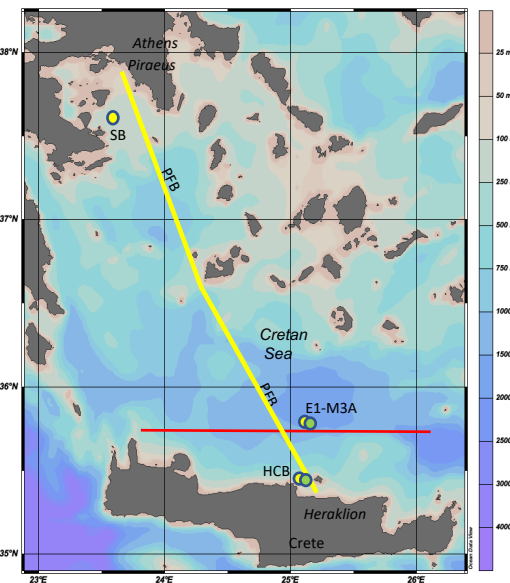
$\Delta T$  vs Wind



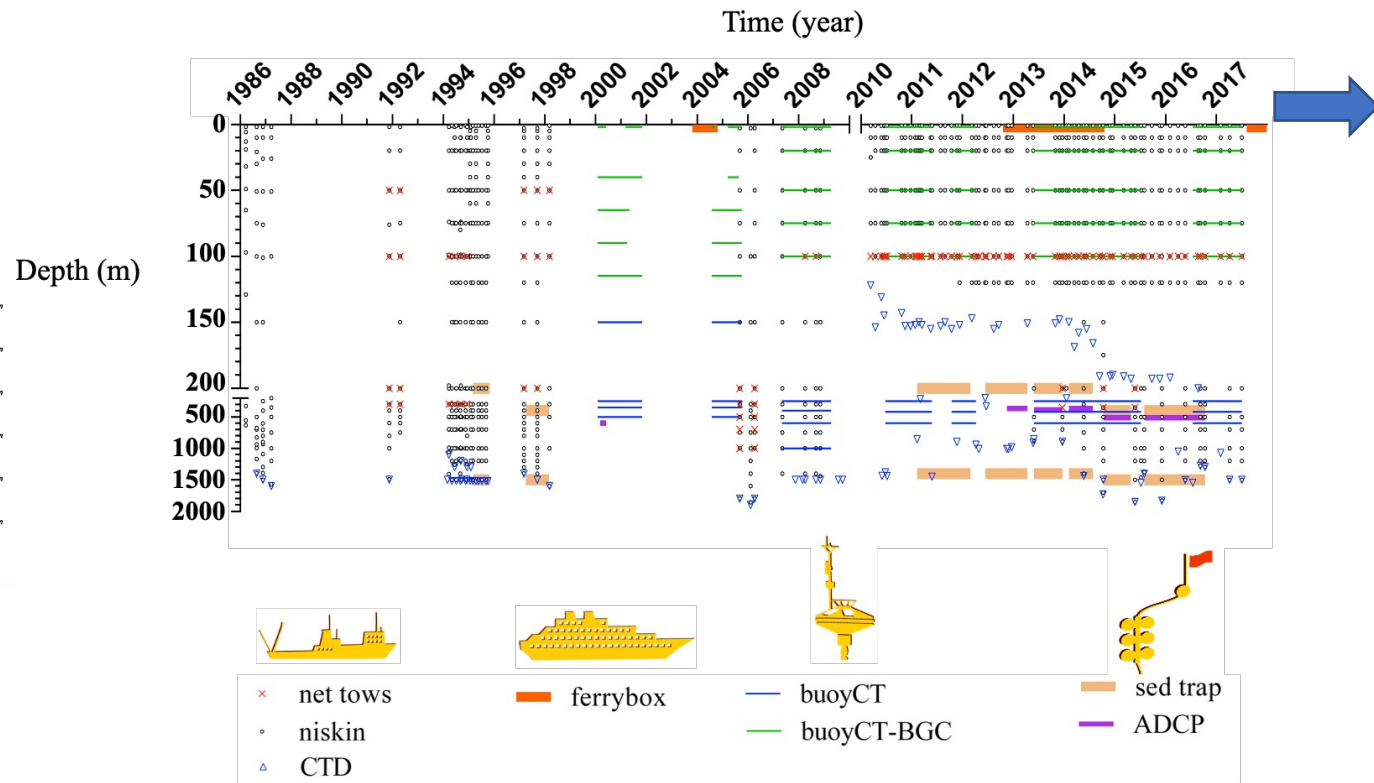
# Reasons for overall short operation period

## POSEIDON - Cretan Sea Observatory (Pilot Super Site)

Modified from Petihakis et al. 2018



- RV(CTD)
- Buoy
- Ferrybox
- Glider



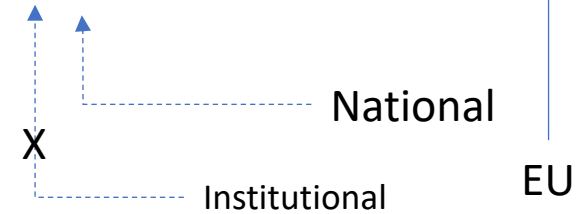
# Reasons for overall short operation period (maybe valid also for other Med Sea countries?)

From EuroGOOS FB Whitebook 2017 conclusions

- FB systems are still operated mainly by research money and suffer from unsustainable funding in the long term;
- New FB lines must be developed, especially in the Mediterranean and Black Sea;

- **Maintenance**
- Ship moved to another route  
→ **reinstalation**
- (Temporary change of route)
- (Major malfuction)

**Funding insufficient**



**Personell effort insufficient:**

- Technician
- Communication with ship operator
- Data processing, management
- Science products
- Dissemination

Thank you for your attention !

