FerryBox activities in the Aegean Sea (Eastern Mediterranean)

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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

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

recent upgrades

- CO₂ sensor (SubCtech)
- Water Sampler (Teledyne)
- SBE temperature (SBE) sensor at start of water circuit

Dissolved Oxygen (Aanderaa optode)

Temperature-Conductivity (SBE45)

Fluorescence-Turbidity (Scufa II Turner Design)
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. (?)
Data management procedures

Ferrybox PFB (SAEG01)
Data flows handled by CMEMS In Situ Thematic Assembly Center (INS TAC)

Quality control procedure

<table>
<thead>
<tr>
<th>EuroGOOS Data-MEQ Recommendations for RTQC procedures_V1.2 (Ferrybox)</th>
<th>QARTOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ RTQC1: Platform metadata check</td>
<td>Group 1 Required</td>
</tr>
<tr>
<td>✓ RTQC2: Impossible date test</td>
<td>✓ Test1: Gap Test</td>
</tr>
<tr>
<td>✓ RTQC3: Impossible location test</td>
<td>✓ Test2: Syntax test</td>
</tr>
<tr>
<td>✓ RTQC4: Frozen date/location/speed test</td>
<td>✓ Test3: Location test</td>
</tr>
<tr>
<td>✓ RTQC5: Speed range test</td>
<td>✓ Test4: Gross Range test</td>
</tr>
<tr>
<td>✓ RTQC6: Pump or flow-meter test (PFB: valve filter test)</td>
<td>✓ Test5: Climatological Test</td>
</tr>
<tr>
<td>✓ RTQC7: Pump history test (PFB: ship outgoing test)</td>
<td>Group 2 Strongly Recommended</td>
</tr>
<tr>
<td>✓ RTQC8: Global range test</td>
<td>✓ Test 6: Spike test</td>
</tr>
<tr>
<td>✓ RTQC9: Regional range test (PFB: adapted to sub-regional range test)</td>
<td>Test 7: <em>Rate of Change</em> test</td>
</tr>
<tr>
<td>✓ RTQC10: Gradient test (includes spike test)</td>
<td>✓ Test 8: Flat Line test</td>
</tr>
<tr>
<td>✓ RTQC11: Frozen test</td>
<td>Group 3 Suggested</td>
</tr>
</tbody>
</table>

*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

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

All data

Matchup data ($d_S = S_{FB} - S_{other\ platform}$)

Problematic buoy sensor

Good matchup

11th FerryBox Workshop, 28-29 September 2022, Hamburg
POSEIDON Ferrybox (PFB) – some applications

From Korres et al. 2014 JMS

PFB Data assimilation

18.09.12

SSH model
(without FB data assimilation)

16.10.12

SSH OBSERVATIONS

18.09.12

SSH model
(+FB SST assimilated daily)

16.10.12
POSEIDON Ferrybox (PFB) – some applications

Validation of satellite derived SST

From Potiris et al. 7th FB Workshop

ΔT vs SZA

ΔT vs Wind

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Reasons for overall short operation period

POSEIDON - Cretan Sea Observatory
(Pilot Super Site)

Modified from Petihakis et al. 2018
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 \(\rightarrow\) reinstalation

- (Temporary change of route)

- (Major malfunction)

Funding insufficient

Personell effort insufficient:
- Technician
- Communication with ship operator
- Data processing, management
- Science products
- Dissemination

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Thank you for your attention!