Overview of BOOS work in 2018 and plan for 2019

BOOS activities focus on 3 issues: filling observation gaps, improve forecast and modelling and provide better data and product service.

- Gap filling: 1) use research and environmental observations (NRT ship data delivery, BOOS-HELCOM); 2) use cost-effective technology: Argo, FB; (BOOS-TTs, JERICO3) 3) optimal design (EOOS); 4) integrate satellite, in-situ and models (DA)
- Forecasting capacity development: ensemble forecast, Seamless forecasting (national projects), machine learning; Cal/val, DA, (BALMFC-BOOS), knowledge transfer (BOOS-BE), best practice (BOOS-NOOS),
- Data and Product services: open and free data (ftp data exchange, BOOS-EMODnet, data mining), new products (OMIs, national, satellite), product quality (BOOS-BALMFC), user requirements (HELCOM, storm surge, blue growth, BOOS-EMODnet, to be enhanced)

<table>
<thead>
<tr>
<th>Activities</th>
<th>2018 Progress review</th>
<th>2019 Workplan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BOOS Projects</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOOS AM</td>
<td>Hosted by EuroGOOS, Workshop on BOOS external cooperation</td>
<td>DMI, BOOS-SG</td>
</tr>
<tr>
<td>BOOS ftp TT</td>
<td>A decision was made that the ftp network will stay as it is but MSI will investigate the option changing to sftp</td>
<td>MSI</td>
</tr>
<tr>
<td>BOOS WebWG</td>
<td>- BOOS-AM documents on the web - BALMFC quality info. on the web - Implementation plan of BOOS Web upgrade (draft is ready)</td>
<td>BSH, DMI, SMA</td>
</tr>
<tr>
<td>BOOS-MME</td>
<td>- Extending number of stations for data exchange – on-going - Implementation plan – TBD</td>
<td>BSH+BALMFC members, FCOO, IOPAN</td>
</tr>
<tr>
<td>BOOS-Cal/val</td>
<td>- use MFC cal/val toolbox for BOOS cal/val (skype meetings) - change current protocol (Matlab) to python</td>
<td>BSH, MSI+Cal/val partners</td>
</tr>
</tbody>
</table>
| **BOOS-Da** | - PDAF cooperation: weekly meetings, developing PDAF-NEMO and PDAF-HBM (SST only, done)  
- BOOS DA team formed, Lars Axell lead | **toolbox using python** | Adam Nord  
Lars Axell  
J.She+PDAF team members | May 2019 |
| --- | --- | --- | --- | --- |
| **BOOS Ship data NRT delivery** | - Skype meetings  
- IOPAN NRT data delivery done  
- Implementation plan – TBD | **Ship data NRT delivery (Plan & actions, with 1-2 more partners)** | Johanna Linders’ replacement | 2019 |
| **BOOS observing network optimization** | - Assessment of BOOS observations (conf. paper)  
- CMEMS in-situ requirement (report and a ms)  
- OceanObs paper on “Integrated coastal and biological observations” (ms);  
- FMI and IOPAN are operating Argo floats in the Baltic. Areas covered: Gotland deep, Bothnian Sea, Bothnian Bay, Bornholm deep | **BOOS SG (J. She lead), FMI** | J.She + BOOS SG | 2019 |
| **External cooperation** | - use operational products for HELCOM  
- NRT delivery of HELCOM ship data  
- Assimilating HELCOM data  
- Joint EuroSEA proposal, HELCOM support letter | **-Finalize the CMEMS and BOOS-EMB paper**  
- Further exploring potential BOOS observing system optimization  
- Argo floats are part of continuous monitoring of the Baltic Sea. Floats in the Gotland Deep, Bothnian Sea and Bothnian Bay are replaced with a new one after c. one year measurement cycle. Measurements every 7 days, data available online through Coriolis** | J. She, U. Lips  
BOOS-SG  
All partners | Feb. 2019  
2019 |
| **BOOS-CMEMS** | - BALMFC quality products on BOOSweb  
- Contribute to CMEMS in-situ | **-Improved BALMFC presentation on BOOS-Web** | BSH+other BALMFC | 2019 |
<table>
<thead>
<tr>
<th>Requirement Report</th>
<th>Partners</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltic Sea Checkpoint: data adequacy assessment report</td>
<td>DMI, FMI, TTU, KU, SMA, SMHI</td>
<td>J.She</td>
</tr>
<tr>
<td>-Promote BOOS in EMODnet as a SG member</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-EU-CN cooperation on marine data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint paper on potential BOOS-Baltic Earth cooperation</td>
<td>BOOS-SG, IOW</td>
<td>J.She+SG, All</td>
</tr>
<tr>
<td>-Initiate OO-Climate research interactions via bilateral cooperation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint paper on “Integration coastal and biological obs.”</td>
<td>BOOS-SG, EMB</td>
<td>J.She+SG</td>
</tr>
<tr>
<td>-Promote potential funding oppot. For coastal OO in JPI Ocean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-NOOS Chair gives presentation in BOOS AM and vis verse</td>
<td>DMI, MUMM, BSH</td>
<td>Common BOOS-NOOS partners (BSH, DMI, FCOO, HZG)</td>
</tr>
<tr>
<td>-Share best practices: NOOS is learning BOOS-BALMFC cooperation;</td>
<td>DMI, MUMM, BSH</td>
<td></td>
</tr>
<tr>
<td>-Identify joint projects with common interests</td>
<td>DMI, MUMM, BSH</td>
<td></td>
</tr>
<tr>
<td>Contribute to EOOS Forum and EOOS conference</td>
<td>J. She + BOOS SG</td>
<td>All</td>
</tr>
<tr>
<td>-Responding to EOOS call for action in “national coordination of ocean observing”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>by initiating relevant actions in BOOS members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involvement in EuroGOOS WG &amp; TTs</td>
<td>SMHI, DMI, BSH</td>
<td>To be planned</td>
</tr>
<tr>
<td>Contribution to TT</td>
<td>SMHI, DMI, BSH</td>
<td></td>
</tr>
<tr>
<td>To be planned</td>
<td>SMHI, DMI, MSI, FMI…</td>
<td></td>
</tr>
<tr>
<td>Contribution to TT</td>
<td>SMHI, MSI, SYKE</td>
<td>To be planned</td>
</tr>
<tr>
<td>Euro-Argo</td>
<td>FMI, IOPAN</td>
<td>FMI, IOPAN</td>
</tr>
<tr>
<td>FMI and IOPAN are operating Argo floats in the Baltic. Areas covered: Gotland deep, Bothnian Sea, Bothnian Bay, Bornholm deep</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argo floats are part of continuous monitoring of the Baltic Sea. Floats in the Gotland Deep, Bothnian Sea and Bothnian Bay are replaced with a new one after c. one</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Measurement Cycle</td>
<td>Data Availability</td>
</tr>
<tr>
<td>------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>2019</td>
<td>Year measurement cycle. Measurements every 7 days, data available online through Coriolis</td>
<td>To be planned</td>
</tr>
</tbody>
</table>

### Joint proposals

- **Glider TT**
  - FMI, MSI
  - To be planned
  - DMI, HZG
  - 2019

### CoastalWG

- A framework for identifying and filling observational gaps
- Supporting EOOS (EOOS-Forum, EOOS Conference)
- To be planned
- DMI, HZG
- 2019

### SAWG

- i) Supporting EOOS (EOOS-Forum, EOOS Conference)
- ii) Contribution to OceanObs19 (GOOS) on integrated observing (special issues paper)
- iii) Forecasting challenge survey
- iv) ToR - TBD
- DMI, BSH
- -ToR
- DMI, BSH
- May 2019

### DMWG

- Contribution to WG
- SMHI...
- Contribution to WG
- SMHI...
- 2019

### New proposals

- **EuroSEA**
  - BOOS-HELCOM integration
  - DMI, TTU
  - To be submitted
  - DMI, TTU

- **JERICO3**
  - Baltic Sea observing (details to be discussed)
  - FMI, SYKE, SMHI
  - To be submitted
  - FMI, SYKE, SMHI

- **BALREC**
  - Baltic Sea reconstruction *(failed)*
  - SMHI, DMI, HZG

- **H2020 Space call**
  - Oyster restoration
  - DMI, HZG, CoastalWG
  - To be submitted
  - DMI, HZG

### Joint publications

- **OSR2 (2016)**
  - 4 papers on “extreme low sea level”, “Major Baltic Inflow”, “Extreme events” & “Eutrophication” published
  - DMI, MSI
  - N/A
  - N/A

- **Frontier of Mar. Sci**
  - 3 papers on Shallow water Argo obs.
  - FMI
  - N/A
  - N/A

- **EuroGOOS conf. proceeding**
  - 3 papers on “BOOS obs. Assessment”, “seamless modelling” & “Emerging service needs” published
  - DMI
  - N/A
  - N/A

- **OSR3 (2017)**
  - 3 papers on “Extreme sea ice and its impacts”, “phytoplankton bloom” & “silent storm” under review.
  - MSI, DMI
  - Finalizing
  - MSI, DMI
  - 2019

- **OSR4 (2018)**
  - N/A
  - 3 papers on “Oxygen OMI”, “Marine Heatwaves” &
  - MSI, DMI
  - June 2019
<table>
<thead>
<tr>
<th>Geosci. Model Dev.</th>
<th>Frontier of Mar. Sci</th>
<th>“Upwelling” to be submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 papers on “CMEMS in-situ”, “integrated observing” and “EMODnet” are under review in OceanObs19 Special issue</td>
<td>Finalizing</td>
<td>DMI, BOOS-SG</td>
</tr>
<tr>
<td>Nemo-Nordic 1.0: a NEMO-based ocean model for the Baltic and North seas – research and operational applications</td>
<td>DMI, MSI, IOW BOOS-SG</td>
<td>Finalizing</td>
</tr>
<tr>
<td>3 papers on “BOOS-BE”, “sea level reconstruction” and “EOF-based reconstruction of SST and SSS” are under review in Baltic Sea Transition special issue</td>
<td>Finalizing</td>
<td>DMI, BOOS-SG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2019</td>
</tr>
</tbody>
</table>

SMHI, FMI