**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)

| | **2018 Progress review** | | **2019 Workplan** | | |
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| **Activities** | **What** | **Who** | **What** | **Who** | **When** |
| **BOOS Projects** | | | | | |
| BOOS AM | Hosted by EuroGOOS, Workshop on BOOS external cooperation | DMI, BOOS-SG | -Will be hosted by IOW<br>-1d WS on coastal climate change and earth system sci.<br>-0.5d National + project reporting<br>-0.5d Business meeting | DMI, SG<br>IOW<br><br>All<br>All | Late May – June19 |
| BOOS ftp TT | A decision was made that the ftp network will stay as it is but MSI will investigate the option changing to sftp | MSI | N/A | N/A | |
| BOOS WebWG | - BOOS-AM documents on the web<br>- BALMFC quality info. on the web<br>- Implementation plan of BOOS Web upgrade (draft is ready) | BSH, DMI, SMA | BOOS web upgrade (Plan and actions) | Jan, BOOS WebWG | 2019 |
| BOOS-MME | - Extending number of stations for data exchange – on-going<br>- Implementation plan – TBD | BSH+BALMFC members,<br>FCOO, IOPAN | -MME for Extended number of stations<br>- Implementation plan<br>-MME method improvement | BSH+MME partners<br>FMI+BSH<br>All | 2019 |
| BOOS-Cal/val | - use MFC cal/val toolbox for BOOS cal/val (skype meetings)<br>- change current protocol (Metlab) to python | BSH,<br>MSI+Cal/val partners | -More partners use the common cal/val toolbox<br>-An implementation plan<br>-Joint development of cal/val | Thorger<br>Cal/val team members | May 2019 |

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| | - BOOS cal/val team formed, BSH lead<br>- Some partners have started to use the cal/val toolbox | | toolbox using python | | |
| BOOS-DA | - PDAF cooperation: weekly meetings, developing PDAF-NEMO and PDAF-HBM (SST only, done)<br>- BOOS DA team formed, Lars Axell lead | DMI, BSH, FMI, SMHI | -PDAF-NEMO operational<br>-An implementation plan<br>-Continue of PDAF cooperation | Adam Nord<br>Lars Axell<br>J.She+PDAF team members | May 2019 |
| BOOS Ship data NRT delivery | - Skype meetings<br>- IOPAN NRT data delivery done<br>- Implementation plan – TBD | SMHI, IOW, IOPAN (Task leader is in maternity leave) | 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)<br>- CMEMS in-situ requirement (report and a ms)<br>- OceanObs paper on "Integrated coastal and biological observations" (ms);<br>- 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 | - Finalize the CMEMS and BOOS-EMB paper<br>- Further exploring potential BOOS observing system optimization<br>- 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 + BOOS SG | 2019 |
| **External cooperation** | | | | | |
| BOOS-HELCOM | - use operational products for HELCOM<br>- NRT delivery of HELCOM ship data<br>- Assimilating HELCOM data<br>- Joint EuroSEA proposal, HELCOM support letter | DMI, MSI, SMHI | -Find new funding opportunities<br>-Join HELCOM meetings | J. She, U. Lips<br>BOOS-SG<br>All partners | Feb. 2019<br>2019<br><br>2019 |
| BOOS-CMEMS | - BALMFC quality products on BOOSweb<br>- Contribute to CMEMS in-situ | BSH, MSI<br>DMI | -Improved BALMFC presentation on BOOS-Web | BSH+other BALMFC | 2019 |

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| | requirement report | | | partners | 2019 |
| BOOS-EMODnet | Baltic Sea Checkpoint: data adequacy assessment report | DMI, FMI, TTU, KU, SMA, SMHI | -Promote BOOS in EMODnet as a SG member<br>-EU-CN cooperation on marine data | J.She | 2019 |
| BOOS-Baltic Earth | Joint paper on potential BOOS-Baltic Earth cooperation | BOOS-SG, IOW | -Initiate OO-Climate research interactions via bilateral cooperation | J.She+SG, All | 2019 |
| BOOS-EMB | Joint paper on "Integration coastal and biological obs." | BOOS-SG, EMB | -Promote potential funding opport. For coastal OO in JPI Ocean | J.She+SG | 2019 |
| BOOS-NOOS | - NOOS Chair gives presentation in BOOS AM and vis verse<br>- Share best practices: NOOS is learning BOOS-BALMFC cooperation;<br>- Identify joint projects with common interests | DMI, MUMM<br><br>BSH<br><br>DMI, MUMM | Share NOOS best practices in BOOS (Ensemble forecasting risk index)<br>BOOS-NOOS common projects (River runoff, cal/val)<br>BOOS-NOOS common proposals | Common BOOS-NOOS partners (BSH, DMI, FCOO, HZG) | 2019 |
| BOOS-EOOS | - Contribute to EOOS Forum and EOOS conference<br>- Promote EOOS in OceanObs19 | J. She + BOOS SG | -Responding to EOOS call for action in "national coordination of ocean observing" by initiating relevant actions in BOOS members | All | 2019 |
| **Involvement in EuroGOOS WG & TTs** | | | | | |
| Tidal gauge TT | Contribution to TT | SMHI, DMI, BSH | To be planned | SMHI, DMI, MSI, FMI… | 2019 |
| Ferrybox TT | Contribution to TT | SMHI, MSI, SYKE | To be planned | SMHI, MSI, SYKE | 2019 |
| Euro-Argo | FMI and IOPAN are operating Argo floats in the Baltic. Areas covered: Gotland deep, Bothnian Sea, Bothnian Bay, Bornholm deep | FMI, IOPAN | - 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 | FMI, IOPAN | 2019 |

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| | | | year measurement cycle. Measurements every 7 days, data available online through Coriolis | | |
| Glider TT | | FMI, MSI | To be planned | FMI, MSI | 2019 |
| CoastalWG | A framework for identifying and filling observational gaps | DMI | -Joint proposals<br>-CoastalWG Work document | DMI, HZG | 2019 |
| SAWG | i) Supporting EOOS (EOOS-Forum, EOOS Conference)<br>ii) Contribution to OceanObs19 (GOOS) on integrated observing (special issues paper)<br>iii) Forecasting challenge survey<br>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 | N/A | 3 papers on “Oxygen OMI”, “Marine Heatwaves” & | MSI, DMI | June 2019 |

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| | | | "Upwelling" to be submitted | | |
| Frontier of Mar. Sci | 3 papers on "CMEMS in-situ", "integrated observing" and "EMODnet" are under review in OceanObs19 Special issue | DMI, BOOS-SG | Finalizing | DMI, BOOS-SG | 2019 |
| | 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 | DMI, MSI, IOW BOOS-SG | Finalizing | DMI, MSI, IOW BOOS-SG | 2019 |
| Geosci. Model Dev. | Nemo-Nordic 1.0: a NEMO-based ocean model for the Baltic and North seas – research and operational applications | SMHI, FMI | | | |