

# BOOS Annual Meeting Report

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Prepared by

Jun She, BOOS Chair

Jens Murawski, Rapporteur

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Venu: Brussels, Belgium

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# BOOS Annual meeting, Brussels 23-rd of May 2018

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13 partners have been represented at the meeting: BSH, DMI, FCOO, FMI, HZG, MIG, MSI, IOUG, IOPAS, SMA, SMHI, SYKE, UL (see participation list)

Apologies from:

- Paulius Petrošius, Lithuanian Environmental Protection Agency, Marine Research Department (LEPA MRD).
- Valters Zeizis, LVGMC
- Marie Maar, DCE,
- Michael Naumann and Robert Mars, IOW
- Inga Dailidienė, KU
- Pia Andersson, SMHI
- Włodzimierz Krzymiński (IMGW)
- Tanya Eremina (RSHU)

## 1. BOOS Modelling Program

### 1.1. Update of the Scientific Plan of the BMP for every BOOS model

The document shall include a short description of the model, including figures showing the model domain and it shall cover status and plans for model development. Comment from Jun She (DMI): BOOS annual reports have been uploaded, including a short introduction into BOOS models. The reports can be a good start point.

### 1.2. BMP modelling platform

BMP would like to promote a multi-model platform rather than a single model exercise. The BOOS community is running several operational models. This is not reflected by the MoU (Memorandum of Understanding) of the BMP. It was suggested by Lars Axell (scientific BMP coordinator) and Adam Nord (operational BMP coordinator) to replace the concept of “one BOOS model” with a “MME of BOOS models” in the BMP MoU. This should be supported by the BOOS MME project (see information below) and reflected on the BOOS web page.

### 1.3. Discussion of BOOS activities and projects

BOOS projects are intended to raise the interest from several members and should foster multi-lateral cooperation. The following ideas for new BOOS projects/activities were discussed:

1. BOOS cooperation on Multi Model Ensemble (MME) system: (partners that took part in the discussions, more might be interested: BSH, DMI, MSI, FMI, SMHI, FCOO, IOPAS, IOUG), a more detailed list of what has been discussed follows below: P1
2. BOOS cooperation on the development of common cal./val. Tools. (Interested partners: DMI, BSH, MSI, HZG, FCOO, IOUG, FMI, SMHI), a more detailed list of what has been discussed follows below: P2
3. BOOS cooperation on Data assimilation (interested partners: SMHI, DMI, BSH, MSI, HZG, FMI), a more detailed list of what has been discussed follows below: P3

**P1: BOOS project on Multi Model Ensemble (MME):** BOOS modelling program is favoring a multi model approach over a single model approach and is seeing MME as the natural tool to estimate model

performance, to analyze model quality (validation) and to provide access to the data via links to the different institutes. The following points were discussed in more detail:

- Organization of MME tasks: Currently BSH is leading the MME activities in the BAL MFC. Under BOOS it's FMI who leads the MME Task Team, aiming at implementation of operational use of sea level MME developed in BAL MFC. It was discussed if a system of sub-regional MME's would help to distribute the effort and if it would make it easier for local partners to take part in the activity. BOOS partners expressed their wish to continue with the current system.
- Long-term perspective in MME:
  - a) New parameters can be added: sea ice, waves (already planned in CMEMS) and extend the number of sea level stations.
  - b) Local model skill assessments: The first issue that was discussed was the possibility to divide MME into different regions, to make it possible to analyze the local performance of the different models. This is somewhat restricted by the availability of observed data in the different sub-regions. In some sub-regions, the skill assessment may depend on the model performance at some very few data points.
  - c) Analysis of MME averaging weights: The averaging weights used to generate MME products from the ensemble of participating models can be analyzed to evaluate the individual models.
  - d) Data access: There is a wish to extend the MME model skill assessment tool with a data access function to the 3D model fields. Data access shall be provided via links to the participating institute data portals/ftp sides. This requires the application of common model data standards.
  - e) MME products: In future time 3D MME products could be derived from the model ensemble.

**Conclusion:** FMI will continue lead BOOS MME TT on sea level application; BSH agreed to run and to develop the BOOS MME system in the future, with the help of BOOS partners; BMP will supervising long-term MME development.

## **P2: BOOS cooperation on the development of common cal./val. Tools:**

Eight BOOS partners (DMI, BSH, MSI, HZG, FCOO, IOUG, FMI, SMHI) expressed their wishes to cooperate on the development of common cal./val tools. The following items were discussed:

- CMEMS BAL MFC cal./val. tools and matrices (developed mainly by BSH and MSI) have been identified as a good starting point for the common development.
- Some BOOS partners expressed their wish to develop the new tools in Python, a license free alternative to Matlab. BSH has started the work of converting CMEMS cal./val. tools to python.
- Some BOOS partners expressed their wish to develop a number of specific cal./val. tools, instead of a single, combined cal./val. tool.
- Observation data collection and distribution for validation needs to be coordinated. CMEMS In-Situ TAC
- SMHI offered to use their git version control system as a repository for the common cal./val. tools.
- BAL MFC is planning a Cal/val tool workshop this year, which will look into the relevant user uptaking issues.

**Conclusion:** A BOOS Cal/Val Task Team is formed. BSH has been suggested to lead the BOOS cooperation on common cal./val. tools. Thorger Bruening (BSH) will distribute further information on the current status and future plans for CMEMS cal./val. tool development to all BOOS partners.

**P3: BOOS cooperation on Data assimilation (DA):** At least six BOOS partners (SMHI, DMI, BSH, MSI, HZG, FMI) are interested in developing common DA tools and in exchanging their experiences.

- Framework specific developments: Forum to exchange experiences and to discuss the developments of the different DA systems: PDAF (BSH, DMI, SMHI, AWI,...), 3D/4D EnVar (SMHI,...) and others. The existing PDAF cooperation within CMEMS could be extended. Different DA techniques are used in BOOS. Therefore the scope is wider.
- PDAF: Initiate a systematic comparison of the available filter (LSTFK, LSEIK, etc.).
- Cooperation on the generation of ensembles.

**Conclusion:** A BOOS Data Assimilation Task Team is formed. Lars Axell (SMHI) is the leading contact of the TT.

#### 1.4. BMP organizational issues

The BMP is led by Pia Anderson from SMHI, who has been on sick leave for some months. The three Board members Adam Nord, Lars Axell and Jens Murawski are subjected to re-election this year. The re-election has to be organized by the BMP Chair. This is nevertheless not possible as SMHI has not assigned a replacement for Pia. The BOOS AM agrees that the existing Board membership is extended automatically for another year.

## 2. E-Hype service contract

Johan Söderkvist (FCOO) raised the question of the future continuation of the E-Hype service contracts. Further information needs to be provided to BOOS partners that are using SMHI's E-Hype service. According to individual communication, SMHI seems to plan to cancel existing service contracts and to enter new service agreements. The following link to the e-hype web page provides further information: <https://www.smhi.se/en/services/open-data/hype-data-delivery-services-1.104448>. It is noticeable, that the new deterministic-forecast-contract (6000 euro/year) does not seem to include nutrients (N/P). A contract that includes all variables costs 19000 euro/year.

**Action to be taken:** BOOS is encouraged to find a reasonable solution.

- Would it be possible to have a collective (shared) License for all BOOS members who need the product?
- Is there an alternative method which is open and free or cheaper?

## 3. BOOS website WG

Content management on the BOOS web-site WG (Jan H. Reißmann):

- 1.) Call for pictures and content for the main BOOS web page. Use of the web portal to promote BOOS products (MME) and member products and data.
- 2.) Submenus under "Documents"
  - a. Documents/Annual Meetings/: The folder has been updated with content going back to the BOOS meeting in Hamburg (2011). Earlier years have to be provided. BOOS members expressed their wish to use this page as an archive of earlier meetings.

- b. Documents/newsletter/: Existing newsletters (2012 to 2016) have been made available. Dedicated effort needed for the production of new newsletters. BOOS related news, articles, etc. shall be published on the front page.
  - c. Documents/publications/: Publication of abstracts, links and content (if possible) of recent publications for promotion. Jun She suggested that every BOOS partner should provide at least 3 publications with links. EuroGOOS uses this page for promotional material.
  - d. New item Documents/steering group/: for publication of steering group documents and minutes.
- 3.) Main items on the BOOS web page: Products, Forecasts, Observations, Community Products, Members
- a. Purpose and content of each of these main items have to be defined more clearly.
  - b. Member information needs to be cleaned up and needs to be made consistent across the web page.
  - c. BOOS web page should present all models that are available and links to the institutes.
  - d. Observations-Page presents a list of available data and could be made more interesting to look at, if example plots and figures were added.
  - e. Observations-Page: Sea level observations are presented in two categories: DMI and SMHI; which is misleading, as “DMI” refers to the short-term operational data collection page and “SMHI” refers to the longer-term operational data collection page. The two products are therefore not identical, which is confusing.
  - f. Use of the BOOS web page to present information on other projects, like BONUS, CMEMS-BalMFC, etc.
- 4.) CMEMS-BalMFC on the BOOS web page. Vibeke Huess and Priidik Lagemaa fostered the discussions with a presentation of ideas for a BalMFC item on the BOOS web page. The BalMFC product quality documents QUID with results from the CMEMS cal./val. assessment could be made available via the BOOS web page. The CMEMS cal./val. results shall be made assessable via a web-tool, which provides access via click on a map of station. The BOOS partners approved the idea, but left the details of how the CMEMS cal./val. results shall be linked to BOOS web portal open.

## 4. BOOS Observation Program (BOP)

### 4.1. BOP Organization Issue

Currently there is a lack of leadership of BOP. Due to uncertainty of on-going personnel change, SMHI decided not to take the lead of BOP for the moment, but is interested to contribute.

### 4.2. BOOS NRT Ship data delivery Task Team

Johanna Linders (SMHI) agreed to take over the responsibility for this task team on from Pia Andersson (SMHI), who is currently not available due to illness. She gave a presentation at the scientific workshop of the BOOS annual meeting and demonstrated that the technology (software) for near-real time ship data delivery is available and currently tested. A 2<sup>nd</sup> workshop on near-real time ship data delivery is in planning.

Johanna raised the question of who is getting and using ship data in real time? The following voices provide an overview over the discussion.

- Johann Söderquist (FCOO) showed interest and asked where to get the data.
- Lars Axell (SMHI) stated the importance of near-real time data for operational data assimilation. Data processing and delay mode delivery might render the data uninteresting for data assimilation. All data assimilation systems do their own internal quality control.

- Jan H. Reißmann(BSH): Near-Real time data delivery is currently not planned. The main reason for providing data in delay mode is the quality control of the data.

#### 4.3. EOOS – BOOS:

BOOS members: EOOS strategy promotes and support national monitoring activities. It might help to sustain the funds by putting pressure on the management on institute level.

Observing system integration (Glenn Nolan): EOOS role is to help with the identification of observation gaps and to analyze the sustainability of the observing systems in Europe. It is planned to subcontract some of the investigations to ROOS members. EOOS is helping with the organization of workshops to bring the important players together. It can't contribute directly with funding, as the main funding for observing system development and operation is coming from the national partners and not from the EU.

**Table 1 BOOS Tasks identified**

Task #	Tasks	Responsible	Deadline
1	Make the minutes from the meeting available	Jun She	Asap
2	Upload all presentations as PDF and pictures on the BOOS web page	Jan Hinrich Reißmann	Asap
3	Coastal WG membership in Baltic Sea (biogeochemical background is preferred)	All	Asap
4	BOOS contribution to EOOS conference Nov. 2018	Jun She	Nov. 2018
5	BOOS contribution to GOOS white paper for OceanObs19	Jun She+STG	30 Sep. 2018
6	Update of the Scientific Plan of the BMP for every BOOS model	Lars Axell	Next Annual meeting
7	BOOS MME Task Team	Laura Tuomi	
8	BOOS Cal/Val Task Team	BSH (TBD)	
9	BOOS Data Assimilation Task Team	Lars Axell	
10	E-Hype contract	Johan Söderquist, Vibeke Huess, Adam Nord, STG	Asap
11	BOOS NRT Ship data delivery Task Team	Johanna Linders	Next Annual meeting
12	The 2 <sup>nd</sup> BOOS NRT Ship data delivery	Johanna Linders	pending
13	Detailed planning on BOOS TTs and WGs	BOOS STG	23 May 2018

## Appendix 1: BOOS Annual activity overview

Jun She gave a presentation on BOOS 2017/18 activities in the BOOS workshop. Here is a summary.

### A1.1 BOOS Communication

- BOOS Workshop on Coastal Operational Oceanography, 22<sup>nd</sup> May 2018, BELSPO, Brussels (22 participants, 17 presentations)
- BOOS Annual Meeting (13 partners attended, apology from 7, no response from 3)
- During 2017/18, funding opportunities from EuroGOOS, ESA and CMEMS have been broadcasted
- Annual report: we resumed member's annual report procedure. 12 partners sent their annual report which were uploaded in BOOS web: <http://www.boos.org/documents/annual-meeting-documents/annual-meeting-2018-brussels/>
- Intensify BOOS communication to engage "silent" members. Lack of funding and organizational and personnel changes are the main reasons for being silent and not taking part in the annual meeting. In the past year, contacts are resumed for 6 partners. We will continue to engage all BOOS partners in BOOS activities.

### A1.2 BOOS external cooperation

- **BOOS-EuroGOOS:**
  - o BOOS is involved in SAWG, DataMEO WG, coastal WG (new)\*, Glider TT (new), Ferrybox TT, Tidal gauge TT, EuroArgo TT etc.
- **BOOS-CMEMS:**
  - o BOOS-BAL MFC will cooperate on website, MME, cal/val tool, data assimilation and ocean monitoring index
  - o BOOS members are involved in CMEMS INSTAC, OCTAC, SSTAC and SICTAC.
- **BOOS-EMODnet:**
  - o BOOS partners are involved in EMODnet Physics, EMODnet Chemistry, SeaDataCloud, BSCP etc.
- **BOOS-MedGOOS:**
  - o BOOS partners and MedGOOS partners are working on H2020 project CLAIM: monitoring, modelling and cleaning marien plastics
- **BOOS-NOOS:**
  - o NOOS Co-Chair was invited to give a talk in BOOS Workshop 2018. Potential cooperation was discussed on sharing the boundary conditions for forecasting systems, MME and future BONUS joint initiatives.
- **BOOS-GOOS-EOOS:**
  - o contribution from BOOS to EOOS Forum (March 2018) and OceanObs19 white paper-

\*The EuroGOOS Coastal WG is still open for members for the Baltic Sea, currently only one member is from BOOS. For Baltic Sea, some with biogeochemical background is preferred. Write to [Glenn.Nolan@eurogoos.eu](mailto:Glenn.Nolan@eurogoos.eu) if you wish.

### A1.3 BOOS modelling activities in 2017/18

#### Collabrative modelling:

- NEMO cooperation: SMHI, BSH, DMI, FMI, MSI, (IOPAN)
- ERGOM cooperation: BSH, IOW, DCE, MSI
- HBM cooperation: BSH, DMI, MSI, FMI, UL, KU
- WAM cooperation: FMI, BSH, DMI, MSI

- PDAF cooperation: DMI, BSH, SMHI, FMI, AWI, (HZG)
- Cal/Val cooperation: BSH, MSI, SMHI, DMI, FMI
- MME cooperation: BSH, FMI, DMI, SMHI, MSI, FCOO, IOPAN

**Institutional modelling:**

- Ice modelling: SMHI, FMI, BSH, DMI, FMI, MSI, IOPAN, IMWG, FCOO, HZG
- Ecological modelling: SMHI, IOPAN
- Ocean modelling: IMGW (mike3), FCOO (GETM), HZG (NEMO, GETM, SCHSIM), IOW
- Wave modelling: IOPAN, IMGW (shallow water), FCOO (WW3), IOUG, MIG
- Oil spill modelling: BSH, DMI, SMHI, FMI, FCOO

**Developing new forecasting capacities**

- Basin-scale: BALMFC2 – coupled NEMO-ERGOM-WAM-PDAF
- Coastal-estuary continuum (Physics, HBM, UL)
- Coastal-estuary continuum (BGC, Flexsem, DCE)
- Skin-temperature forecast (DIVOST-COM, DMI)
- SPM transport modelling (CLAIM, DMI)
- Mesoscale and submesoscale eddy modelling (CLAIM, DMI)
- Prediction of micro- and macroplastics drift (CLAIM, DMI)
- Sea level MME for operational use at national level (BOOS)

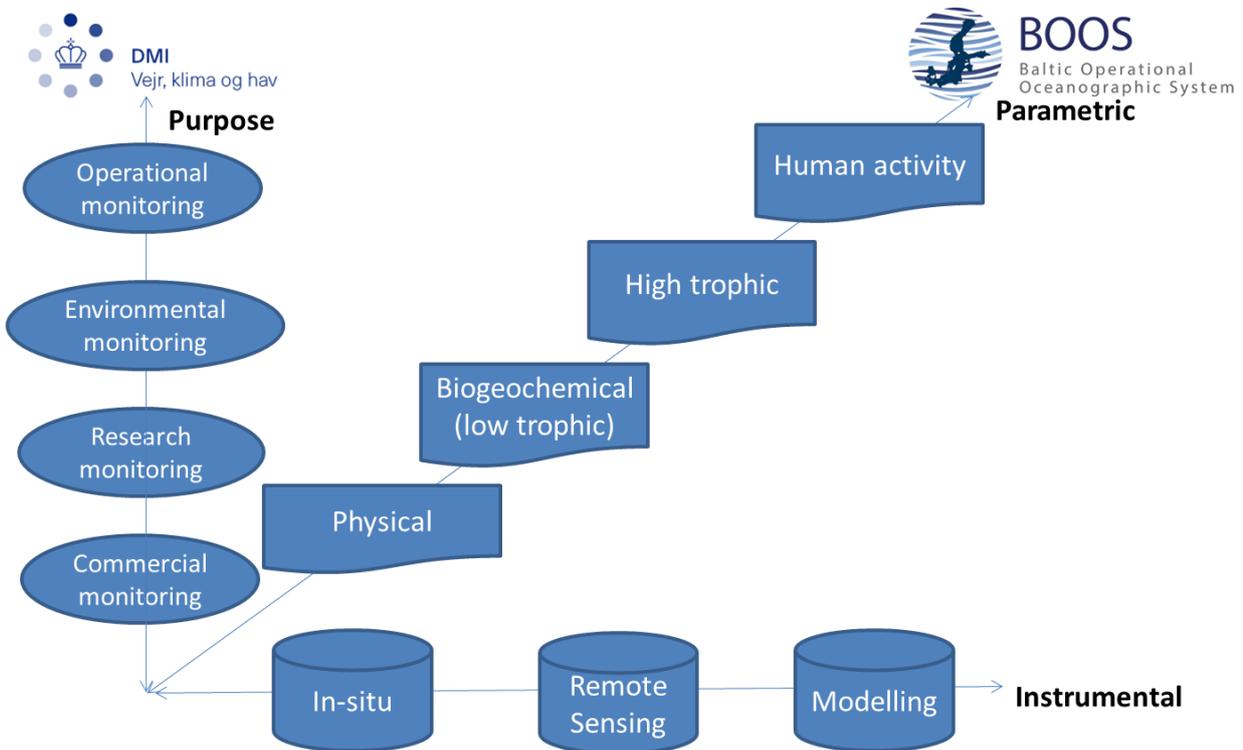
**A1.4 BOOS observation activities in 2017/18**

**BOOS activities:**

- Data exchange WG: IMGW WL data added
- NRT ship data delivery TT
  - a) NRT ship data delivery workshop
- Observing system assessment and integration
  - a) She J. 2018, Assessment of Baltic Sea observations EuroGOOS conf. paper
  - b) She J. and J. Murawski: GEO Blue Planet special issue, submitted
  - c) BSCP Data adequacy report 2: fit-for-purpose assessment
  - d) Contribution to CMEMS in-situ assessment
  - e) Contribution to OceanObs19
- CMEMS OSR2017
  - a) Ocean monitoring indexes (OMI)
  - b) Baltic Inflow
  - c) Baltic Eutrophication
  - d) Extremes in sea level, SST and waves
  - e) "Silent" storm event in western Baltic Sea

**Table A1.1 Observational platforms used in BOOS partners**

	BSH	DMI	EPA	FMI	IOPAN	IOUG	IMGW	KU	MSI	SMA	SMHI	IOW	SYKE
<b>TG</b>	X	X	X	X			X		X	X	X	X	
<b>Argo</b>	X			X	X						X		
<b>Buoy</b>	X		X	X	X		X				X	x	
<b>RV</b>	X		X	X	X	X	X	X			X	X	X
<b>Glider</b>				X					X				
<b>ADCP</b>	X	X		X			X				X	x	
<b>FST</b>	X	X	X	X		X	X				X	X	X
<b>Ferrybox</b>							X		X		X		X



**BOOS and EOOS: breaking institutional and community barriers in ocean observing (OceanOBS19)**

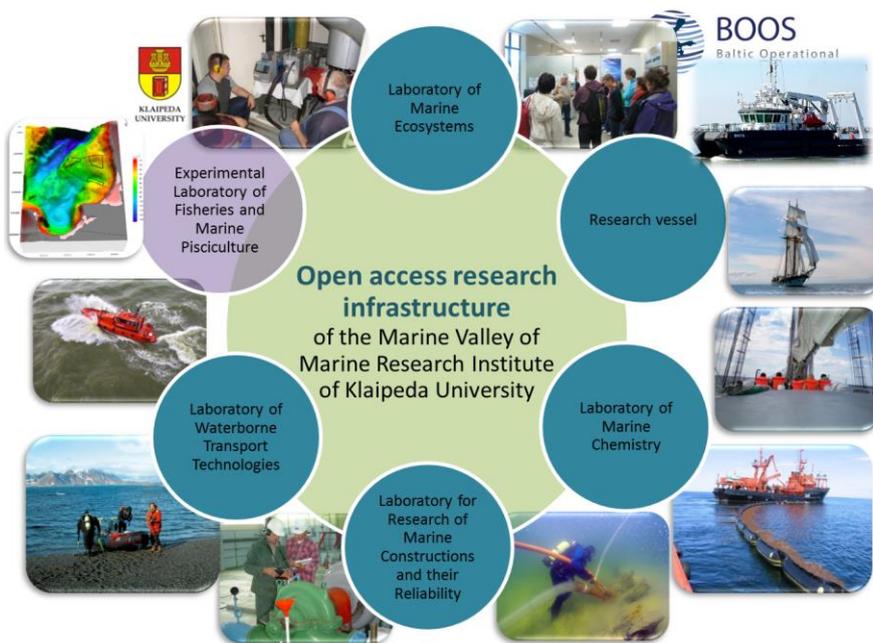
**Figure A1.1 BOOS contribution OceanObs19 and EOOS**

***New monitoring activities and technology development at national level:***

- Gliders in operation (FMI, N. Baltic)
- 4 Argo floats in operation; Drifters and ADCP in operation (IOPAN, S. Baltic)
- New research vessel (IOUG)
- Open access research infrastructure of the Marine Valley of Marine Research Institute of Klaipeda University (KU)



- Usability of emerging technologies in the Baltic Sea conditions (SYKE)
  - phycoerythrin fluorescence
  - spectral fluorescence
  - variable fluorescence
  - backscattering
  - spectral absorption
- Ferrybox oil slick detection instrument (MSI)
- Ferrybox microplastic litter instrument (HCMR+MSI, initiated)



**Figure A1.2 Marine Valley in KU**



## Appendix 2 BOOS AM 2018 participants and presentations

	Name	22	22	22	23	23	23	Presentation	Affiliation
		AM	Lun.	Din.	AM	Lun.	PM		
1	Adam Nord	x	x	x	x	x	SG	<a href="#">Annual report/Coordinator report</a>	SMHI
2	Antti We-sterlund	x	x	x	x	x	O	Circulation dynamics in the Gulf of Finland	FMI
3	Glenn Nolan	x	x	O	O	O	O	EOOS and Coastal WG	<a href="#">EuroGOOS</a>
4	Jan H.Reiβ-mann	x	X	X	X	X	SG		BSH
5	Jens Murawski	x	X	x	X	x	x	CLAIM – Managing plastic litter in the marine environment with the help of ocean models	DMI
6	Johan Söderkvist	x	x	x	x	x	O		<a href="#">FCOO</a>
7	Johanna Linders	x	x	x	x	x	SG	NRT ship data exchange and INSTAC	<a href="#">SMHI</a>
8	Jukka Seppälä	X	x	O	x	x	X	Online measurements for phytoplankton biology – Lessons from Algaline and JericoNEXT	SYKE
9	Jun She	X	x	x	x	x	SG	Challenges in Baltic Sea forecast Baltic Ocean Ocean Status Report 2017	DMI
10	Lars Axell	X	x	x	x	x	O	NEMO data assimilation BMP annual report	SMHI
11	Laura Tuomi	O	O	O	x	x	SG		FMI
12	Mirosław Darecki	O	O	O	x	x	SG		IOPAS
13	Ola Kalen	X	x	x	X	X	SG		SMHI
14	Patrik Ljungemyr	X	x	O	X	x	O		SMHI
15	Piotr Piotrowski	X	x	x	X	X		Task dependency graph in ocean model parallelisation	MIG
16	Priidik Lagemaa	X	x	x	O	O	O		MSI
17	Sebastian Grayek	X	x	x	x	O	O		HZG
18	Sebastian Lagrand	X	x	O	O	O	O	Introduction to NOOS activities	MUMM
19	Tarmo Kõuts	X	x	x	x	x	O	Oil detection with ferrybox system: GRACE project	MSI
20	Thomas Hammarklint	X	x	x	x	x	O	Common reference datum in the Baltic Sea Upgraded Sea Level network in Sweden	SMA
21	Thorger Brüning	X	x	x	x	x	O	Multi-Model Ensemble Prediction	BSH
22	Uldis Bethers	O	O	O	x	X	O		UL
23	Vibeke Huess	X	x	x	x	X	X	<a href="#">Copernicus Marine Service-Phase2: the Baltic modelling activities.</a>	DMI
24	Vilnis Frishfelds	10a m	x	x	x	X	x	Coastal modelling of Liepaja port and lake system	UL
25	Witold Cieslikiewicz	x	x	x	x	X	O		IOUG
Tot al	25	22	22	19	22	21	9		

X: Yes, O: No.

## Appendix 3: BOOS Workshop on Coastal Operational Oceanography

**Meeting Place:** BELSPO (EuroGOOS)

**Address:** Avenue Louise 231 Brussels, 1050 Belgium  
**Date:** May 22, 2018

### Tuesday 22 May Workshop on Coastal Operational Oceanography

8:30 – 9:00 Registration	
9:00 Welcome from EuroGOOS	
Session 1: BOOS external cooperation Chair: Tarmo Kouts	9:10-9:30 EOOS Overview, <i>Glenn Nolan, EuroGOOS</i> 9:30-9:50 Introduction to NOOS activities, <i>Sebastian Legrand, MUMM (TBC)</i> 9:50-10:10 BAL MFC Phase 2, <i>Vibeke Huess, DMI</i> 10:10-10:30 Introduction to BOOS activities, <i>Jun She, DMI</i> Discussions on potential collaborations <ul style="list-style-type: none"> <li>- Potential BOOS-EOOS cooperation</li> <li>- Potential BOOS-NOOS cooperation</li> <li>- Potential BOOS-CMEMS cooperation</li> </ul>
Coffee Break	10:40-11:00
Session 2: Baltic Modelling Program (BMP) Chair: Lars Axell	11:00-11:20 NEMO-Nordic: status and future development, <i>Adam Nord, SMHI</i> 11:20-11:40 NEMO Data Assimilation and PDAF cooperation, <i>Lars Axell, SMHI</i> 11:40-11:50 Forecast and modelling challenges in BMP, <i>Jun She, DMI</i> Questions and discussions <ul style="list-style-type: none"> <li>- What are your modelling needs and challenges at national level?</li> <li>- How can community basin-scale models help in coping with national modelling challenges?</li> <li>- How can basin scale forecast benefit the local forecast? (lateral boundary conditions)</li> <li>- How can MME be used for improving operational forecast?</li> <li>- Standardized cal/val approach (CMEMS cal/val metrix)</li> <li>- Bathymetry and coastline optimization (to ensure use of best and most updated data)</li> <li>- Towards coastal data assimilation (PDAF)</li> </ul>
Lunch	12:30-13:30
Session 3: coastal modelling and forecasting Chair: Adam Nord	13:30-13:45 Task dependency graph in ocean model parallelization, <i>Piotr Piotrowski, MIG</i> 13:45-14:00 Coastal modelling of Liepaja port and lake system, <i>Vilnis Frishfelds, UL</i> 14:00-14:15 Multi-Model Ensemble Forecast for the Baltic Sea, <i>Thorger Brüning, BSH</i> 14:15-14:30 Circulation dynamics in the Gulf of Finland, <i>Antti Westerlund, FMI</i> 14:30-14:45 CLAIM – Managing plastic litter in the marine environment with the help of ocean models, <i>Jens Murawski, DMI</i> Questions and discussions
Coffee Break	15:00 – 15:30
Session 4: coastal monitoring and observations Chair: Jan Hinrich Reißmann	15:30-15:45 NRT ship data exchange and CMEMS INSTAC, <i>Johanna Linders, SMHI</i> 15:45-16:00 Online measurements for phytoplankton biology – Lessons from Algaline and JericoNEXT–coastal session, <i>Jukka Seppälä, SYKE</i> 16:00-16:15 Oil detection with ferrybox system: GRACE project, <i>Tarmo Kõuts, MSI</i> 16:15-16:30 Common reference datum in the Baltic Sea, <i>Thomas Hammarklint, SMA</i> 16:30-16:45 Upgraded Sea Level network in Sweden, <i>Thomas Hammarklint, SMA</i> 16:45-17:00 An introduction to Ocean State Report 2017, <i>Jun She, DMI</i> Questions and discussions
End	17:30
BOOS Dinner	19:00 (place to be decided)

## Appendix 4: BOOS Annual Meeting

**Meeting Place:** BELSPO (EuroGOOS)  
**Address:** Avenue Louise 231 Brussels, 1050 Belgium  
**Date:** May 23, 2018  
**Chair:** Jun She  
**Rapporteur:** Jens Murawski

9:00-10:30	Approval of agenda Round table presentation (official representative and observers) Status of BOOS membership BOOS Modelling Program <ul style="list-style-type: none"> <li>- Annual report, SMHI</li> <li>- Continue discussions on BMP</li> </ul> BOOS Observation Program (leadership and next step) BOOS Activities <ul style="list-style-type: none"> <li>- Website WG</li> <li>- MME TT</li> <li>- NRT ship data delivery TT</li> <li>- Communication</li> <li>- Observing system assessment and integration</li> <li>- BOOS involvement in EuroGOOS Task Teams (TTs) and Working Groups (WGs)</li> </ul>
10:30-11:00	Coffee Break
11:00-12:30	Program continue
12:30-13:30	Lunch
13:30	End of the meeting