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|  | | **NOOS**  **Working group WW** |
| **Working group on** | **Water levels and Waves - DRAFT !** | |

About this document

This document outlines the requirements and structure for developing terms of reference for the NOOS Working group on Water levels and Waves (WG-WW). In this figure all activities are schematized. In this standard document the different goals and activities are described. Former working groups on water level and waves, observation and forecast are combined in 2019.

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Table of Contents

[1. Background, Rationale, and Link with EuroGOOS Strategic Priorities 1](#_Toc526954483)

[2. Target Audience and Expected Impact 1](#_Toc526954484)

[3. Aim, Objectives and Deliverables 1](#_Toc526954485)

[4. Composition and Operation 2](#_Toc526954486)

[5. Mode of Operation 2](#_Toc526954487)

[6. Indicative Timetable (Gantt chart) 2](#_Toc526954488)

# Background, Rationale, and Link with EuroGOOS Strategic Priorities

* The WG-WW consists of the following activities.

1. gather individual observations of water level & waves and guard continuous delivery;
2. present them on the NOOS website and deliver to NWS portal;
3. gather individual forecasts of water level & waves and guard continuous delivery;
4. present them on the NOOS website and deliver to NWS portal;
5. assemble a new Bayesian Model Averaging forecast based on individual national forecasts;
6. redistribute and display information with Matroos data server of Rijkswaterstaat;
7. evaluate forecasts and find clues for improvement.

* exchanging monitoring and forecast data is one of the strategic items in EuroGOOS and NOOS. Gaining extra information by combining these forecasts to a BMA forecast is an excellent demonstration of how collaboration is profitable for all.

# Target Audience and Expected Impact

* Main target audience are the NOOS partners in charge of forecasting.
* By making data easily accessible and open a whole range of users can be served.
* Impact is making better individual (national) forecasts, to have a fall-back and gain insight in bandwidth of forecasts.
* Comparing forecast quality gives insight in models and methods which is the basis for knowledge exchange and improvement of the forecasts.

# Aim, Objectives and Deliverables

* By exchanging each other’s forecasts for their own locations the individual (national) forecasting services gather extra information. This helps to improve their forecasts. Besides that one can get a quick indication on consistency. If their own forecast is an extreme outlier one can take action and look if this is based on an error in the process.
* In future an automatically produced alarm on outlier will be investigated.
* Forecasts of other partners can be used as a fall-back if there is a major breakdown in their own systems.
* Using the method of Bayesian Model Averaging (BMA) an elegant NOOS common forecast can be produced. Based on performance in short history (5 days) a weight is given to individual forecasts and a blend is made. This method also provides percentiles 5% 25% 50% 75% and 95% so we can construct 50% and 90% bandwidth.
* Gathering all information in the matroos data server of Rijkswaterstaat gives possibilities of guarding delivery (and take action by mailing provider), archive forecasts, redistribute to partners and NWS data portal and provide easy access to partners and display on the NOOS site.
* Main outputs are the mentioned operational services, incorporated in the Rijkswaterstaat operational systems and maintenance. Web services can be found at <https://noos.matroos.rws.nl> , viewer incorporated in <http://noos.eurogoos.eu> .

# Composition and Operation

Rijkswaterstaat will carry out this task with the aid of NOOS partners who deliver their forecasts. Deltares will support as a contractor of Rijkswaterstaat.

At the Rijkswaterstaat support organization the systems and data provision is guarded. For this purpose the following contacts are registered:

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# Mode of Operation

* The project is approved by NOOS SG.
* Interaction by mail to all NOOS members, individual contact on specific (technical) issues.
* progress and plans are presented at Annual NOOS meetings.
* operational notice of malfunctioning data provision and contact the specific provider.

# Indicative Timetable (Gantt chart)

The improvement on BMA, decided in NOOS annual meeting of 2017 is delayed. The system where we want to operationalize the new BMA routines will be placed on new hardware. Due to that plan, all the running components must be stable and new developments are temporised. The next identified steps are placed in the Gantt chart.

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|  | **2017** | **2018** | | | | **2019** | | | | **2020** | | | | **2021** |
| inventory needs |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| new hardware RWS operational |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BMA(2) operational (14 locations + 12 new) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| definition new BMA set |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| actions on extending data sets |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| BMA2 with more locations |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Test BMA on wave forecasts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Evaluation water level forecast |  |  |  |  |  |  |  |  |  |  | ?? |  |  |  |
| Evaluation wave forecast |  |  |  |  |  |  |  |  |  |  | ?? |  |  |  |