



# Support MSFD implementation in the Black Sea through establishing a regional monitoring system of cetaceans (D1) and noise monitoring (D11) for achieving GES

**Contract No 110661/2018/794677/SUB/ENV.C2**

## Work Package 3: Assessing and supporting the development of D11 monitoring in the Black Sea

### Deliverable

### Activity 3.2: Regional training workshop on D11 monitoring

#### LIST OF PARTICIPANTS:

No	Participant organization name	Participant short name	Country
1	Institute of Oceanology "Fridtjof Nansen", Bulgarian Academy of Sciences	IO-BAS	Bulgaria
2	Permanent Secretariat of the Agreement on the Conservation of the Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area	ACCOBAMS Permanent Secretariat	Monaco
3	National Institute for Marine Research and Development "Grigore Antipa" Constanta	NIMRD	Romania
4	Turkish Marine Research Foundation (Türk Deniz Araştırmaları Vakfı: TUDAV)	TUDAV	Turkey
5	Mare Nostrum NGO	MN	Romania
6	Green Balkan NGO		Bulgaria
7	Black Sea Basin Directorate	BSBD	Bulgaria
8	Karadeniz Technical University	KTU	Turkey
9	Ukrainian scientific centre of Ecology of Sea	UkrSCES	Ukraine
10	Ministry of Environment, Water and Forest	MWWF	Romania
11	Bulgarian Naval Academy	NVNA	Bulgaria

*©The CENOBS Project owns the copyright of this document, which is supplied confidentially and must not be used for any purpose other than that for which it is supplied. It must not be reproduced either wholly or partially, copied or transmitted to any person without authorization. This document reflects only the authors' views. The author is not responsible for any use that may be made of the information contained herein.*

Deliverable:	Regional training workshop on D11 monitoring
Document Number:	CENOBS – D3.2.
Delivery date:	2021
Call:	DGEnv MSFD 2018 call - MARINE STRATEGY FRAMEWORK DIRECTIVE - SECOND CYCLE: IMPLEMENTATION OF THE NEW GES DECISION AND PROGRAMMES OF MEASURES
Grant Agreement:	Contract No 110661/2018/794677/SUB/ENV.C2

DISSEMINATION LEVEL	
PU: Public	x
PP: Restricted to other programme participants (including the Commission Services)	
RE: Restricted to a group specified by the consortium (including the Commission Services)	
CO: Confidential, only for members of the consortium (including the Commission Services)	

Company/Organization	Name and Surname
Principal writing from IO-BAS	Assoc. Prof. Dr. Veselka Marinova, Assoc. Prof. Dr. Marina Panayotova, Senior assist. Dr. Radoslava Bekova

Contribution from ACCOBAMS  
Permanent Secretariat

Dr. Alessio Maglio and Dr. Achraf Drira

## Table of Contents

1. Introduction	4
2. Regional training workshop on D11 monitoring purpose	4
3. Regional training workshop on D11 organization	4
3.1 Regional training workshop on D11, organized in Varna	4
3.2 Regional training workshop on D11, organized online	5
4. Agenda	5
5. Participants	7
6. General Summary Conclusions	8
6.1. Training day 1 - impulsive noise	8
6.2. Training day 2 and 3 - continuous noise	8
6.3. Documents/material to be sent to participants after the training	9
6.4. Additional information provided by participants	9
7. Presentations	10
8. Measurements scripts	10

## 1. Introduction

CeNoBS project aims to improve the second cycle of MSFD implementation for Descriptor 1 –cetacean and Descriptor 11- noise in the Black Sea, by achieving greater consistency and coherence in determining, assessing, and achieving good environmental status (GES). The project will directly support the assessment of the extent to which GES for D1 and D11 have been achieved in the Black Sea region after the implementation of the 1st cycle of the MSFD and to provide the BS Members States with practical outcomes and means for cooperation to contribute to the next 6-year cycle of MSFD for both Descriptors, in particular for updating their monitoring programmes and their programmes of measures.

Regarding Descriptor 11, the project has the following specific objectives:

- Strengthening capacities of BS competent authorities in D11 monitoring through transferring lessons learnt and good practices developed in other marine regions (Mediterranean – QUIETMED project);
- Increase of national expertise to implement effective noise monitoring through the regional training workshop on D11 monitoring;
- Implement pilot activities on noise monitoring in Romania, Bulgaria, Turkey and Ukraine.

This report is the deliverable of the Activity 3.2 “Regional training workshop on D11 monitoring”, Work Package 3 “Assessing and supporting the development of D11 monitoring in the Black Sea”. The Regional training workshop on D11 monitoring is based on outcomes QUIETMED project and pilots, rolled under this project.

## 2. Regional training workshop on D11 monitoring purpose

The main aim of the Regional training workshop on D11 monitoring is to train scientists and advisors and to strengthening capacities on D11 monitoring, addressing both D11C1 (anthropogenic impulsive sound in water) and D11C2 (anthropogenic continuous low-frequency sound in water) criteria. The workshop will take advantage of the results and outcomes of the QUIETMED project implemented in the Mediterranean, but also the pilot studies under this project.

The course is intended to strengthening capacities on D11 monitoring and to share data and knowledge between scientists and decision makers.

## 3. Regional training workshop on D11 organization

### 3.1 Regional training workshop on D11, organized in Varna

Initially, Workshop was planned to be organized in Varna (Bulgaria) between 26 to 28 March 2020 hosted by the Institute of Oceanology–Bulgarian Academy of Sciences (IO-BAS), at the Golden Tulip Hotel (<https://varna.goldentulip.com>). All travel arrangements for all participants and meeting room facilities were organized and paid by IO-BAS, but due to COVID-19 crisis and based on order № RD-01-127 dated 16.03.2020, amended and ext. with orders №№ RD-01-133 from 18.03.2020, RD-01-137

from 18.03.2020, RD-01-149 and RD-01-152 from 25.03.2020, pursuant to Art. 63, para. 6 of the Health Act and in connection with the Decision of the National Assembly to declare a state of emergency on the territory of the Republic of Bulgaria, from 13 March 2020 to 12 April 2020, the spread of the disease COVID-19 worldwide and declared by World Health Organization pandemic and recommendations of the National Operational Headquarters, established by Order № P-37/26.02.2020 of the Prime Minister of the Republic of Bulgaria, the Minister of Health of Bulgaria ordered the following: *“temporarily prohibit the entry into the territory of the Republic of Bulgaria from 00.00 on 18.03.2020 of citizens of the People's Republic of China, the Islamic Republic of Iran, Bangladesh, the Republic of India, the Republic of Maldives, the Federal Democratic Republic of Nepal, the Democratic Socialist Republic of Sri Lanka , The Kingdom of Spain, Italy, the Republic of Korea, North Korea (DPRK), the United Kingdom of Great Britain and Northern Ireland, France, Germany, the Netherlands and Switzerland with the exception of Bulgarian citizens, family members of Bulgarian citizens and persons with permanent and long-term residence status on the territory of the Republic of Bulgaria, as well as the members of their families.”*

Based on the pointed order and the similar rules introduced also in the partner' countries, the Regional training workshop on D11 monitoring was postponed for July 2020. The situation with COVID-19 crisis in Bulgaria and partners' countries didn't change in July and also flight tickets bought by IO-BAS from Turkish Airlines were cancelled by the company. Due to the above circumstances and the uncertainty in the development of COVID-19 pandemic, there wasn't a possibility for organizing a workshop with physical participation. The partners agreed and took the final decision to organize a virtual workshop in September 2020. The virtual workshop will be organized by ACCOBAMS using Microsoft Teams as an online webinar platform.

### **3.2 Regional training workshop on D11, organized online**

Regional training workshop on D11 monitoring took place between 14 – 16 September 2020 as a virtual workshop using Microsoft Teams as an online webinar platform. The program was organized in 3 consecutive working days by 2 hours sessions every half-day, including:

- 1 day for impulsive noise, 2 days for continuous noise.
- Reviewing of requirements to be compliant with fieldwork and data collection.
- Reviewing of requirements to be compliant with monitoring deliverables.
- Practical sessions with the impulsive noise register.
- Practical sessions with continuous noise analysis tools.

The lecturers for the workshop –Dr. Alessio Maglio and Dr. Achraf Drira were appointed by ACCOBAMS partner.

## **4. Agenda**

The agenda was proposed and prepared by the team of ACCOBAMS partner. Detailed agenda by days and themes are given below.

<b>Monday 14<sup>th</sup> September 2020</b> <b>Session 1 – Impulsive Noise</b>
9h00- 11h00 ( <i>Monaco time</i> ) Presenting the International Noise Register of ACCOBAMS and use for the Black Sea.  Alessio MAGLIO
14h00 – 16h00 ( <i>Monaco time</i> ) Practical sessions for compiling and uploading data; how to use the Register for D11C1 assessment.  Alessio MAGLIO

<b>Tuesday 15<sup>th</sup> September 2020</b> <b>Session 2 – Continuous Noise</b>
9h00- 11h00 ( <i>Monaco time</i> ) Review of requirements to be compliant with field work and data collection: positioning of hydrophones, depth, frequencies, duration.  Alessio MAGLIO & Achraf DRIRA
14h00 – 16h00 ( <i>Monaco time</i> ) Review of requirements to be compliant with monitoring deliverables: indicators, time-series plots, examples.  Alessio MAGLIO & Achraf DRIRA

<b>Wednesday 16<sup>th</sup> September 2020</b> <b>Session 3 – Continuous Noise</b>
9h00- 11h00 ( <i>Monaco time</i> ) Continuous noise analysis tools and algorithms. QUIETMED algorithm, analyses with MATLAB, further programming languages, practical session.  Alessio MAGLIO & Achraf DRIRA
14h00 – 16h00 ( <i>Monaco time</i> ) Sound recording tools, feedback from participants about pilot projects, advice from trainers, wrap up, conclusions  Alessio MAGLIO & Achraf DRIRA

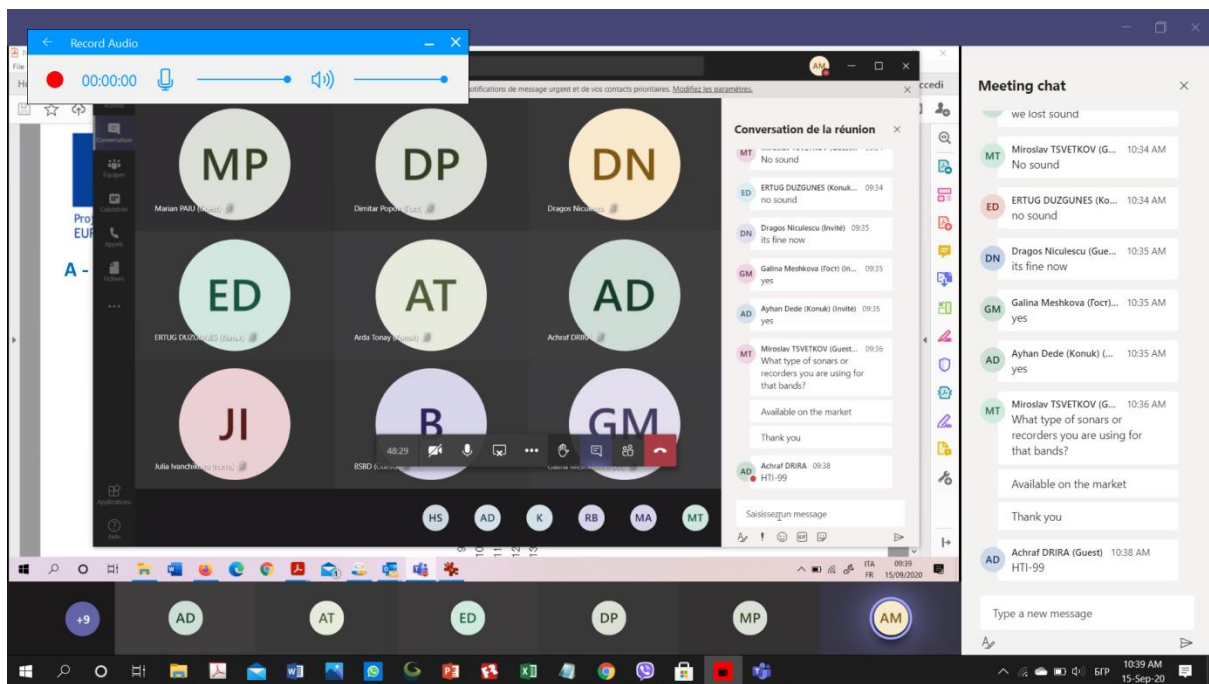
## 5. Participants

The Regional training workshop on D11 monitoring was attended by representatives of all organizations, partners in the project and one external participant from Nikola Vaptsarov Naval Academy in Varna, Bulgaria. Project partners MWWF and BSBD from Bulgaria and Romania also represent the stakeholders, as national authorities responsible for implementation of MSDF in respective member States. The total number of participants in the workshop was 22 experts. Detailed list is given in the table 5.1.

**Table 5.1. List of participants.**

<b>No</b>	<b>Partner</b>	<b>Participant</b>	<b>e-mail</b>
1	<b>ACCOBAMS</b>	Alessio Maglio	alessio.maglio@sinay.fr
2	<b>ACCOBAMS</b>	Achraf Drira	achraf.drira@sinay.fr
3	<b>ACCOBAMS</b>	Maylis Salivas	msalivas@accobams.net
4	<b>NIMRD, RO</b>	Dragos Niculescu	dniculescu@alpha.rmri.ro
5	<b>NIMRD, RO</b>	Gabriel Ganea	
6	<b>Mare Nostrum, RO</b>	Marian Paiu	marian_paiu@marenostrom.ro
7	<b>Mare Nostrum, RO</b>	Costin Timofte	costin_timofte@marenostrom.ro
8	<b>MWWF, RO</b>	Otilia Mihail	otilia.mihail@map.gov.ro
9	<b>IO-BAS, BG</b>	Veselka Marinova	marinova@io-bas.bg
10	<b>IO-BAS, BG</b>	Marina Panayotova	mpanayotova@io-bas.bg
11	<b>IO-BAS, BG</b>	Radoslava Bekova	radoslavabekova@gmail.com
12	<b>NVNA, BG</b>	Miroslav Tsvetkov	m.tsvetkov@nvna.eu
13	<b>Green Balkans, BG</b>	Dimitar Popov	dpopov@greenbalkans.org
14	<b>Green Balkans, BG</b>	Galina Meshkova	gmeschkova@greenbalkans.org
15	<b>BSBD, BG</b>	Yana Balashova	y.balashova@bsbd.org
16	<b>BSBD, BG</b>	Nadezhda Drumeva	bdvarna@bsbd.org
17	<b>TUDAV</b>	Arda M. Tonay	atonay@istanbul.edu.tr
18	<b>TUDAV</b>	Ayhan Dede	aydede@istanbul.edu.tr
19	<b>KTU</b>	Ertug Duzgunes	ertugduzgunes@gmail.com
20	<b>KTU</b>	Hacer Saglam	hacersaglam@yahoo.com
21	<b>UKRSCES</b>	Karina Vishnyakova	karinavishnyakova@gmail.com
22	<b>UKRSCES</b>	Julia Ivanchikova	julia.ivanchikova@gmail.com

All experts participated actively in the discussions by speaking or by chat function.



## 6. General Summary Conclusions

### 6.1. Training day 1 - impulsive noise

1. The whole audience could carry out the upload exercise correctly in the Register.
2. We experienced a problem as we could not see the uploaded data.
3. The problem came from a light bug in the Register app.
4. After consulting with technical staff from QUIETMED partnership, the issue was solved and data could be displayed on the web map.
5. Technical documentation (PPT) was sent to the audience.
6. The trainers consider that the whole audience is now able to use the INR-MED to upload, view and download data.
7. It is highlighted that the INR-MED is operational in the Mediterranean only; There is a need to extend the Register to the Black Sea region, through increased efforts from ACCOBAMS, including in cooperation with the Black Sea Commission.

### 6.2. Training day 2 and 3 - continuous noise

1. The first days was dedicated to preparatory background and theoretical aspects, which is necessary for the practical part.
2. Topics include measurements and modelling, indicators, and the setup of monitoring programmes.
3. QUIETMED algorithm for wave file analysis was presented and a demo was executed with Matlab.
4. A discussion was engaged on programming languages used by participants:
  - 1 team is skilled in Matlab, C++ and more languages.



- 1 team uses Matlab for basic analyses.
  - The rest of participants never used Matlab.
  - Many more participants are skilled or somehow familiar with R.
5. A need appeared to translate the analysis algorithm from Matlab to R language.
  6. Both trainers and participants consider that having algorithms written in R may reach more people involved in D11 in the Black Sea.
  7. Both the trainers and participants consider that knowledge gaps in programming languages may impede understanding and use of algorithms for analyzing measurements, modelling, and interpreting collected data. However, for the objectives of CeNoBS, IO-BAS may support the analysis of recordings done by other participants. To do that, practical arrangements are to be defined by project partners.
  8. Further, a proposal for dedicated training in R (and other relevant topics) was received. From a technical point of view, this new training will be certainly possible once the algorithm will be translated and available in R.
  9. A suggestion is made by trainers to IO-BAS and Bulgarian Naval Academy to use the QUIETMED algorithm to compare with results from the Bulgarian pilot project.
  10. Live feedback was also collected:
    - Spend more time on tools (recording systems) and modelling in training:
      - Hydrophones;
      - tech specifications;
    - More practical engagement on collection, analysis and interpretation of results in respect to the D11C2 and D11C1.
  11. Devote more time to the questions related to data collection and fieldwork organization.

### 6.3. Documents/material to be sent to participants after the training

After the training, the following material is sent to participants:

1. The paper containing with the Wenz model. NB: there is no code available on the internet; it is needed to be re-built following the "instructions" contained in the Wenz paper.
2. QUIETMED algorithm, written in Matlab language.
3. More explanations sent by Achraf concerning technical aspects, to be included in a further version of the training material for continuous noise (PPT).

### 6.4. Additional information provided by participants

#### Pilot project in Romania

1. Deployments are made within a Marine Protected Area.
2. Point sound measurements are being done, of variable duration and with variable frequency.
  - 1 measurement near the surface.
  - 1 measurement near the sea bottom.
3. Strengths and weaknesses of these choices were discussed and advice was provided by trainers on how to improve this.

#### Pilot project in Turkey

1. No noise recordings are being taken.
2. Data about shipping density are being gathered.
3. F-POD recorders have been deployed.
4. Comments from trainers included the following:
  - The study of the shipping density is one important point of a monitoring programme for continuous noise and should continue, especially if the objective is to use acoustic models to study ambient noise levels.
  - F-PODs are certainly useful for Descriptor 1/Ecological Objective 1, but not for ambient noise measurements. Suitable recording systems for D11C2 were presented and suggested to be added to the existing monitoring programmes being run in Turkey.
5. Information on a potentially new project in Turkish waters was given:
  - The new project would use two RT-Sys: one in the Bosphorus, 1 in the eastern Black Sea.
6. The project is now submitted.

## 7. Presentations

Daily presentations are given in the Annexes of the report, as follows:

- Day 1 – Annex 1 Underwater Impulsive noise
- Day 2 (morning session) - Annex 2 Continuous noise – Part I
- Day 2 (afternoon session) - Annex 3 Continuous noise – Part II
- Day 3 – Annex 4 Continuous noise – Part III

## 8. Measurements scripts

Additional information about scripts and functions was provided in Annex 5.