



QUIETMED2 – Joint programme for GES assessment on D11- noise in the Mediterranean Marine Region.

quietMED2

DELIVERABLE

D9.1. Report on impulsive noise data collection to assess the distribution, intensity and effects of underwater noise on cetaceans.

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11	International Council for the Exploration of the Sea	ICES	Denmark



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Abstract

This document is the Deliverable “D9.1. Report on data collection on assessing the distribution, intensity and effects of underwater noise on cetaceans” of the QUIETMED2 project funded by the DG Environment of the European Commission within the call “DG ENV/MSFD 2018 call”. This call funds projects to support the implementation of the second cycle of the Marine Strategy Framework Directive (2008/56/EC) (hereinafter referred to as MSFD), in particular to implement the new GES Decision (Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU) and Programmes of Measures according Article 13 of the MSFD. The QUIETMED2 project aims to support Member States Competent Authorities in the Assessment of the extent to which GES on Descriptor 11-Underwater noise has been achieved in the Mediterranean Region by providing practical outcomes to implement the new GES Decision through: i) a joint proposal of a candidate for an impulsive noise indicator in the Mediterranean Region ii) a common methodology for Competent Authorities to establish thresholds values, together with associated lists of elements and integration rules, iii) a data and information tool to support the implementation of the monitoring programmes of impact of impulsive noise based on the current ACCOBAMS joint register which will be demonstrated on iv) an operational pilot of the tool and v) several activities to boost current regional cooperation efforts of Barcelona Convention developing new Mediterranean Region cooperation measures.

This document reports on the first regional data collection for Descriptor 11 Criterion 1 (impulsive noise), following as much as possible at this stage, the methodological framework built and updated since the adoption of the MSFD. This effort is obviously relevant also for the Common Indicator 26 of the Integrated Monitoring and Assessment Program (IMAP) of the Barcelona Convention. This work focuses uniquely on the distribution in space and time of impulsive noise sources because, whereas these represent the core information needed for all the steps of the monitoring and assessment framework, large gaps still exist at the beginning of QUIETMED2, which we aim to fill up as much as possible. Therefore, the work carried under Activity 9 was done in two steps:

- i) Reviewing and gathering of available data on the distribution of impulsive noise sources
- ii) Launching the Data Call, communicating and guiding target audience towards the preparation and submission to ACCOBAMS, and finally assessing the results of the Call

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List of Abbreviations

CTN	Centro Tecnológico Naval y del Mar
ACCOBAMS	Permanent Secretariat of the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area
DFMR	Department of Fisheries and Marine Research
IZVRS	Inštitut za vode Republike Slovenije/Institute for water of the Republic of Slovenia
HCMR	Hellenic Centre for Marine Research
IOF	Institute of Oceanography and Fisheries
UM	University of Malta -The Conservation Biology Research Group
POLIMI-DICA	Politecnico di Milano-Department of Civil and Environmental Engineering
SSW	Special Secretariat for Water-Hellenic Ministry of Environment and Energy
SPA/RAC	Specially Protected Areas Regional Activity Centre
ICES	International Council for the Exploration of the Sea
MSFD	Marine Strategy Framework Directive
GES	Good Environmental Status
MS	Member States
MED	Mediterranean Sea Region

1. Introduction

The QUIETMED2 Project is funded by DG Environment of the European Commission within the call “DG ENV/MSFD Second Cycle/2018”. This call funds the next phase of MSFD implementation, in particular, to implement the new GES Decision (Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU) and Programmes of Measures according to Article 13 of the MSFD.

The QUIETMED2 project aims to enhance cooperation among Member States (MS) in the Mediterranean Sea Region (MED) to implement the Second Cycle of the Marine Directive and in particular to assist them in the preparation of their MSFD reports through the following specific objectives:

- ◆ Develop and implement a candidate impact indicator in the Mediterranean Region for D11C1 Criteria.
- ◆ Make a joint proposal of a methodology to establish threshold values, list of elements and integration rules to implement the GES decision in reference to D11 in the Mediterranean Region.
- ◆ Build an efficient data and information tool to support the implementation of the D11C1 Criteria and the update of the monitoring programmes of Impulsive Noise according to the new GES Decision.
- ◆ Perform an operational pilot of an impulsive noise impact monitoring programme implemented with the updated Joint register to demonstrate its feasibility.
- ◆ Promote Mediterranean Region Coordination by i) boosting current regional cooperation efforts of Barcelona Convention and others and ii) developing new cooperation measures.
- ◆ Enhance collaboration among a wide network of stakeholders through the dissemination of the project results, knowledge share and networking.

To achieve its objectives, the project is divided in 3 work packages around 3 priorities and 10 activities whose relationships are shown in Figure 1.

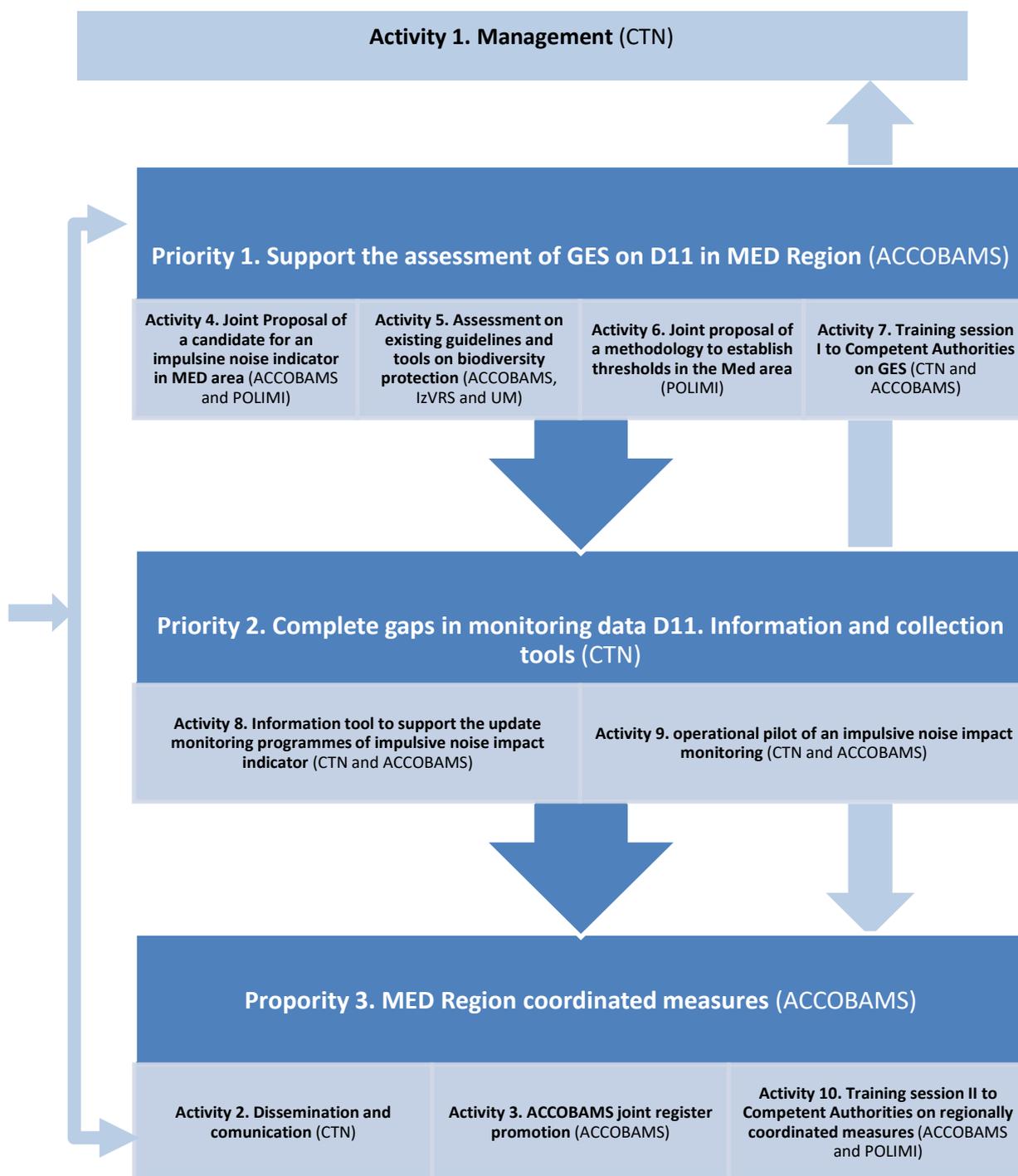


Figure 1. Work Plan Structure

The project is developed by a consortium made up of 11 entities coordinated by CTN and it has a duration of 24 months starting on February 2019.

This document reports on the first regional data collection for Descriptor 11 Criterion 1 (impulsive noise), following as much as possible at this stage, the methodological framework built and updated since the adoption of the MSFD. This effort is obviously relevant also for the Common Indicator 26 of the Integrated Monitoring and Assessment Program (IMAP) of the Barcelona Convention.

2. Review of available data

The available data at the beginning of the project were the so called “Noise Hotspot data” (*Overview of the Noise Hotspots in the ACCOBAMS area*, available at <https://accobams.org/conservations-action/anthropogenic-noise/>). These were the only data collected with the intent of going toward the recommendations of the TG-Noise and, at that time, the CMS/ACCOBAMS/ASCOBANS JNWG was developing recommendations related to EO11 under EcAp.

Due to lasting difficulties in the implementation of D11, during the QUIETMED2 project the ACCOBAMS Secretariat decided to update that work in 2020 with a new data collection about impulsive noise sources in the Mediterranean basin. This work, called Noise Hotspots II, is currently ongoing and results are not yet available. However, a first discussion of data gathered during the data collection phase is presented here.

Despite the differences between the objectives of D11C1 and the objectives of these works, as well as the difference concerning the methodology used for gathering data, main results are worth being presented here as these are the first work in the Mediterranean basin that addressed the spatial and temporal distribution of impulsive noise sources.

2.1. Noise Hotspots

Identifying areas of high anthropogenic pressure on the marine environment is a key element for an effective environmental management and for mitigating impacts. As underwater noise is considered a major threat for cetaceans, in 2015 the ACCOBAMS Agreement undertook a work aiming at identifying noise hotspots and areas of potential conflicts with cetacean conservation. The global aim of this project was to gather baseline knowledge on noise-producing human activities in the Mediterranean Sea. Specific tasks planned for this study included:

- ◆ Making an inventory of noise-producing human activities.
- ◆ Mapping areas where such activities are carried out.
- ◆ Recommending, based on the findings, a methodology to monitor noise from human pressures and noise sources over time.

Efforts in data collection were focused on activities using noise sources identified as being of primary concern for cetacean conservation (coastal and offshore activities, geophysical surveys, naval exercises, marine traffic). Data were collected through various means such as dedicated internet search, official online repositories, and contacts with relevant stakeholders. Data on impulsive noise sources were collected for the period 2005 to 2015. Expected activities for the 2015-2020 period were also collected in order to present a forecast of the use of the Mediterranean Sea by human activities generating impulsive noise.

The inventory of impulsive noise sources was focused on identifying the position of human activities using impulsive noise sources and the period of use the sources, whenever possible. The data collection phase made it possible to collect the following information:

- The position of 1446 harbours (Fig. 2),
- The position of 228 drilling platforms for hydrocarbon exploitation and 52 wind farm projects (Fig. 3), with some information about the periods of use of noise sources
- 830 seismic exploration areas (Fig. 4 and 5), and related information about the period of validity of exploration permits. In some cases the precise periods of the execution of seismic surveys was also available
- The position of several military exercise areas (Fig. 6).

Raw geographical data were plotted to identify the position of each category of noise-producing human activities. Then, summary GIS maps were created using a grid resolution of 40 km x40 km. Available data for seismic surveys allowed for calculating the surface annually bestowed to this activity in the past 10 years throughout the study area. The highest value was attained in 2013 with seismic survey areas covering around 675 000 km², representing 27% of the surface of the Mediterranean. On the opposite, 2005 yielded the lowest value with around 67 000 km² used (3.8% of Mediterranean surface). An increasing trend over the study period is highlighted.

Areas accumulating noise-producing activities (noise hotspots) are pointed out, with a focus on zones overlapping with important cetacean habitat as identified by ACCOBAMS Parties through Resolution 4.15 (2010). Results revealed several noise hotspots overlapping important cetacean habitat such as the Pelagos Sanctuary, the Strait of Sicily, and the upper portion of the Hellenic Trench.

Our results provide key information on the spatial extent of different noise-generating activities in the Mediterranean Sea and yield the first basin-wide overview on areas where potential conflicts between noise-producing activities and cetacean conservation may occur. Moreover, these results provide strong evidence of multiple stressors acting on the marine environment and of the need for urgent management and conservation actions. However, for future studies, it is crucial to increase the information concerning time frames in which target activities are carried out.

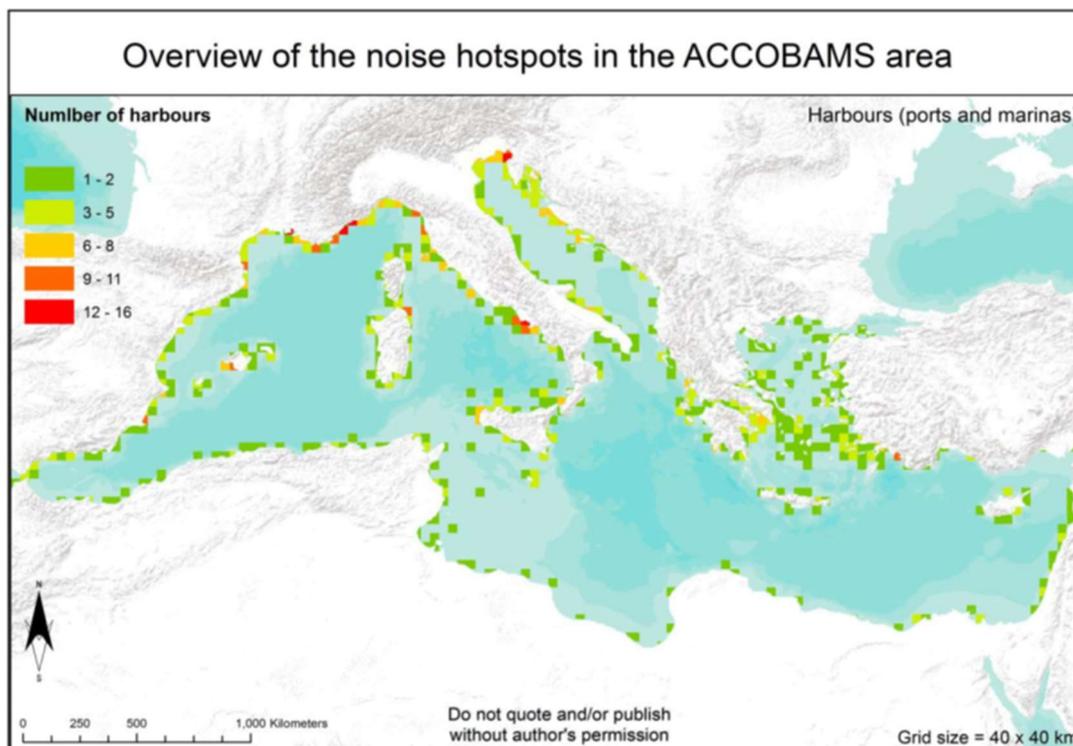


Figure 2. Overview of the noise hotspots in the ACCOBAMS area. Harbours

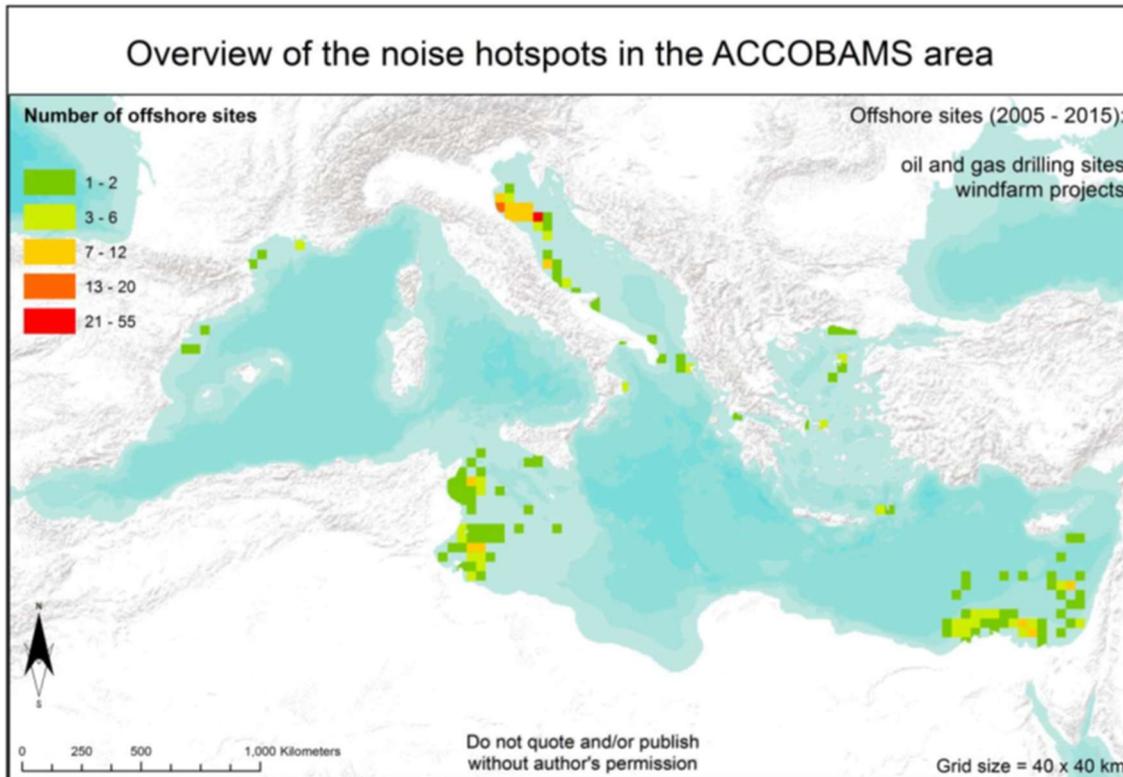


Figure 3. Overview of the noise hotspots in the ACCOBAMS area. Offshore sites.

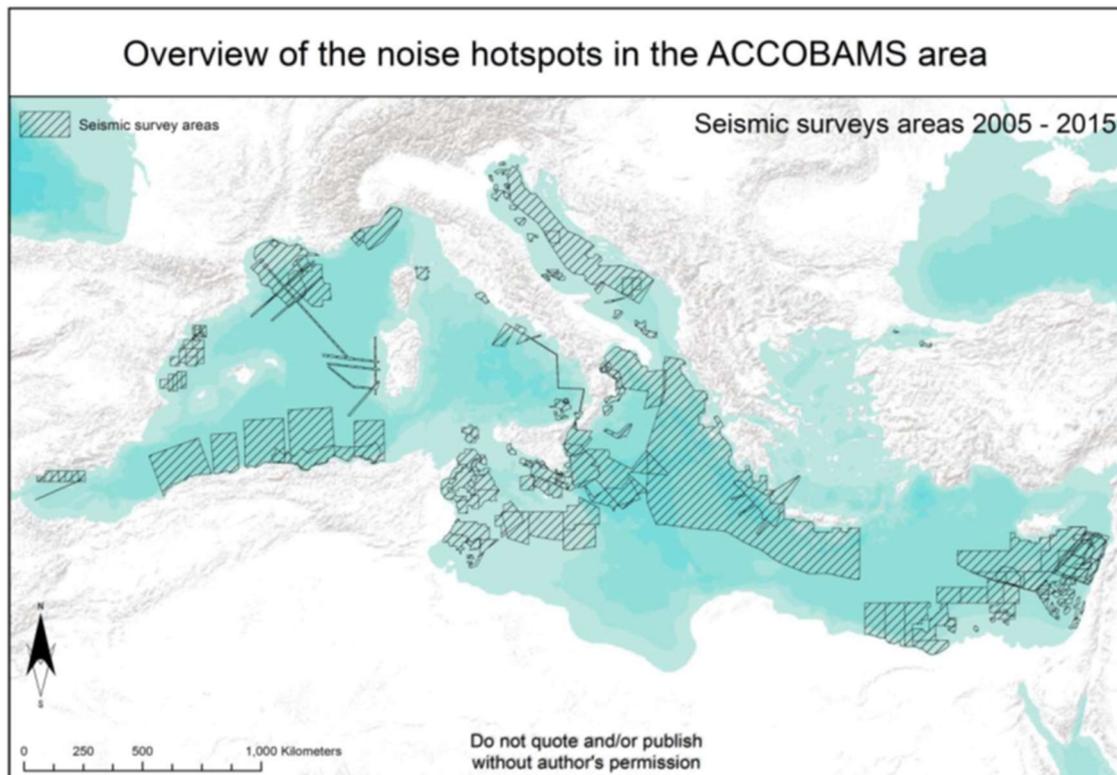


Figure 4. Overview of the noise hotspots in the ACCOBAMS area. Seismic surveys

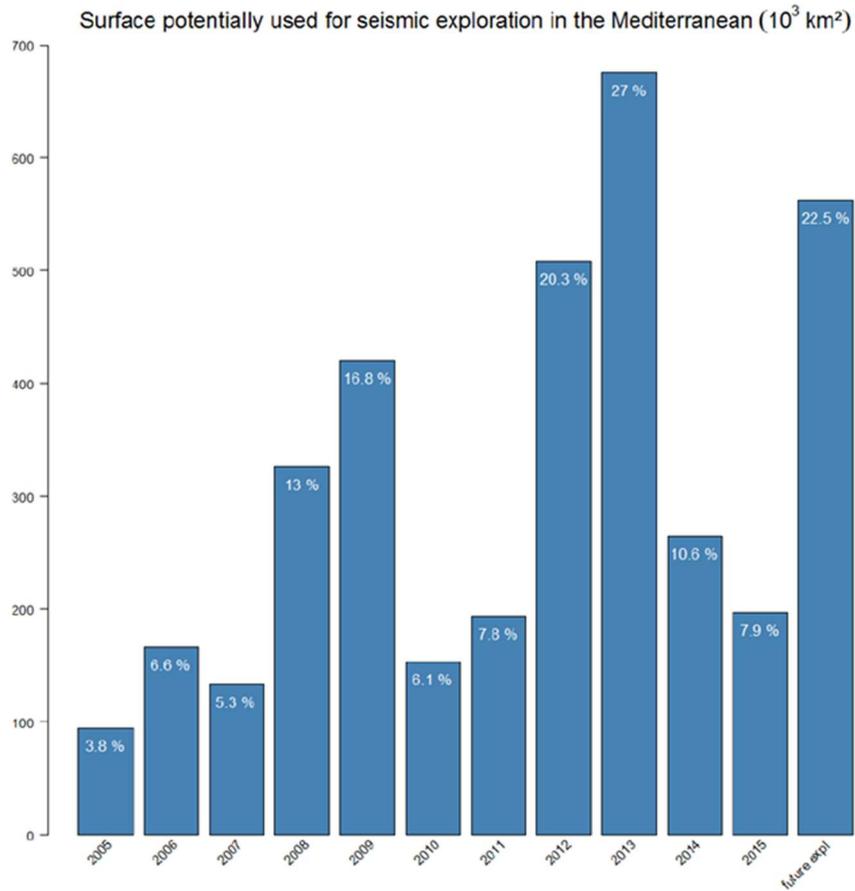


Figure 5. Surface potentially used for seismic exploration in the Mediterranean.

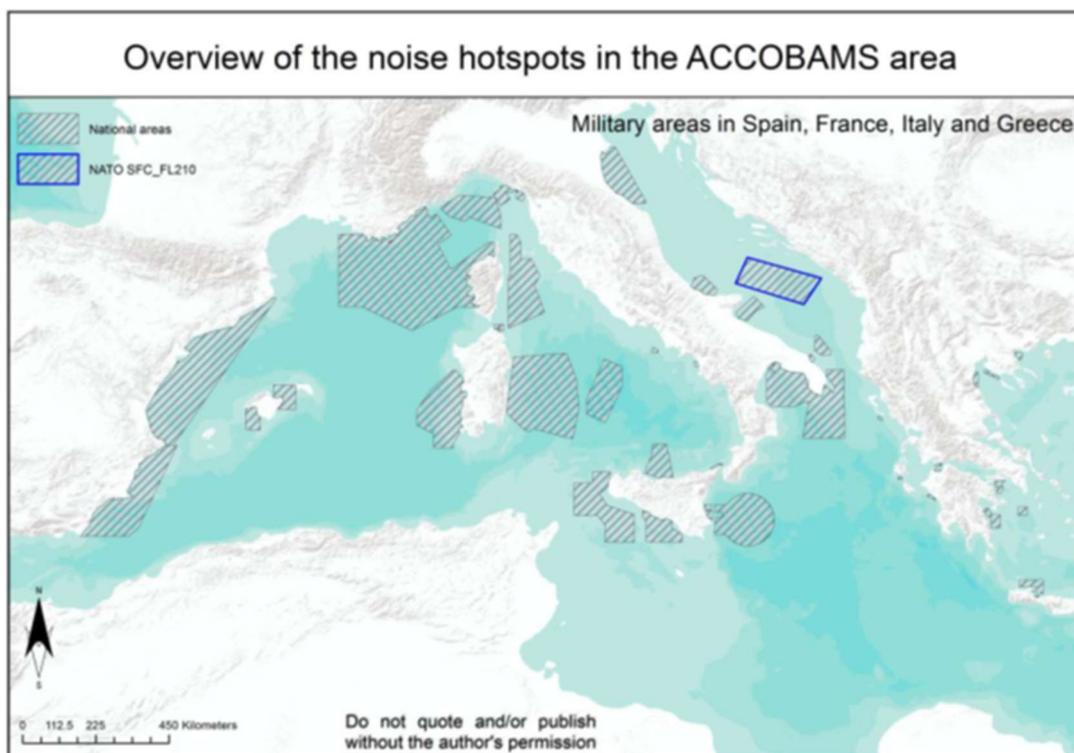


Figure 6. Overview of the noise hotspots in the ACCOBAMS area. Military areas.

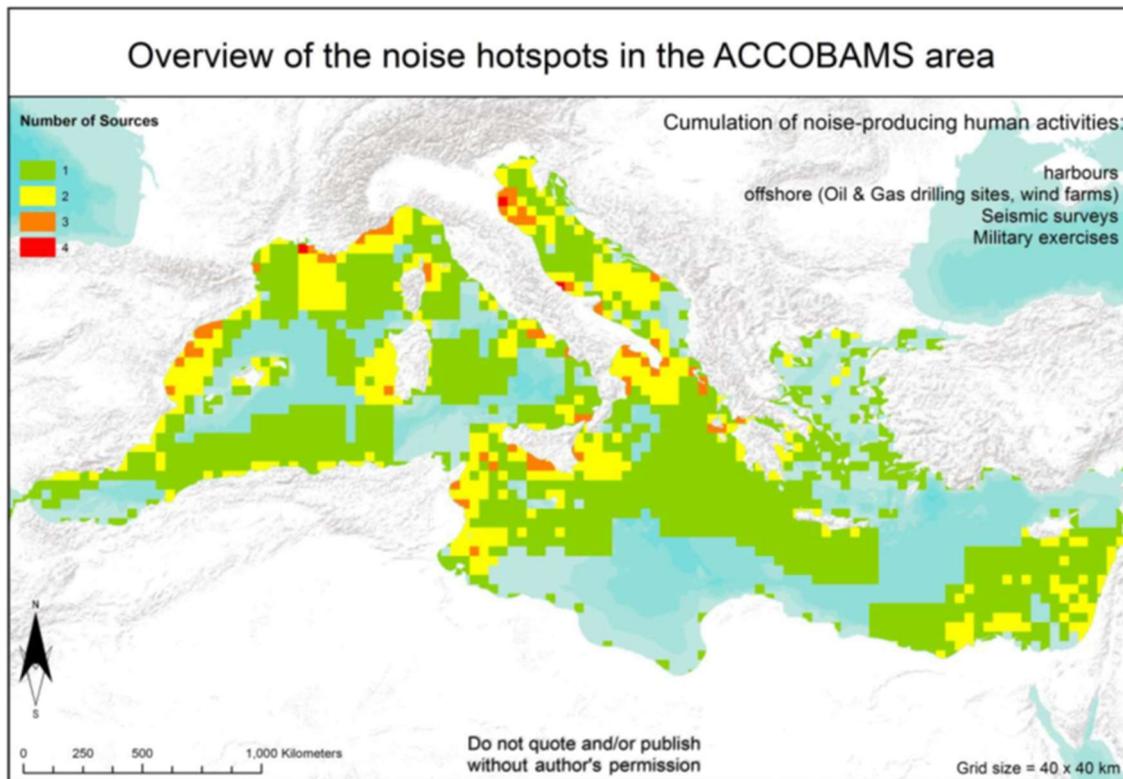


Figure 7. Overview of the noise hotspots in the ACCOBAMS area. Cumulation of noise-producing human activities.

2.1.1. Conclusions from the noise hotspot study

In conclusion, this study is the first to provide a rough overview of the spatial occurrence of major noise-producing human activities in the Mediterranean Sea. Activities targeted in this study are recognised as causing impacts to cetaceans: airguns, sonars, pile drivers, drilling, underwater detonations, and ship and recreational craft noise. The significant amount of data gathered in this study for all these targeted activities, covered almost the whole Mediterranean basin.

An important conclusion of our work is that, considering the current lack of international coordination and data archiving mechanisms, a substantially major effort would be required to properly account for all the underwater noise producing activities and their temporal and spatial occurrence within the ACCOBAMS area.

2.1.2. Limits and shortcomings of this study

This study was far from being complete and it should not be considered exhaustive. Lot of important information was partially accessible or not accessible at all. Many ACCOBAMS countries have not provided details on their underwater noise producing activities. And most importantly, almost all the results presented here are incomplete to some extent. A lot of work is still to be done in order to achieve a full assessment of noise-producing human activities in the ACCOBAMS area and of their impact of cetaceans in the long term.

2.1.3. Where to find the Noise Hotspots data (2016)

Data can be requested to the ACCOBAMS Secretariat and will be soon available on the ACCOBAMS Digital Platform: <https://accobams.sinay.fr>

They are also available from the EmodNet Platform www.emodnet.eu

2.2. Noise Hotspots update in 2020/ 2021

An update of the Noise Hotspot work was initiated in 2020 by ACCOBAMS as part of its 2020-2022 Programme of Work, thanks to a voluntary contribution from the Italian Ministry of Environment. First results have been used in the framework of Activity 9 of QUIETMED2. A summary of the data collection phase is reported here.

The target period for data collection has been from the year 2016 to 2020 as the previous research was from the period 2005 to 2015.

The tasks of this project included the same methodologies than the first Noise Hotspot work:

- ◆ Data searching through the internet and making inventory.
- ◆ Direct contact with data owners when needed.
- ◆ Download and exploration, preparation of data.

With regards to direct contacts, the response rate was relatively high and many contacted stakeholders provided at least some usable information (Table 1).

Table 1. List of stakeholders throughout the Mediterranean that have provided some information.

Country	Institution
DZ	Centre National de Recherche et de Développement de la Peche et de L'Aquaculture
ES	Centro Tecnológico Naval y del Mar (CTN)
GR	Hellenic Centre for Marine Research
HR	Institut za more
HR	Croatian Institute of Oceanography and Fisheries (IZOR)
MA	Institut National de Recherche Halieutique
SI	Institute for Water of the Republic of Slovenia (IZVRS)
TN	Regional Activity Centre for Specially Protected Areas
TR	Istanbul University
ME	Nature and Environment Protection Agency of Montenegro

Concerning the data search, noise-generating human activities were categorised as follow:

1. Ports: whether there are activities such as dredging, pile driving, drilling or the use of explosives;
2. Oil and gas: divided into different categories, which are the exploration activities/seismic surveys and the test phase in which they do drilling of test oil and gas wells;
3. Offshore and coastal works, including marine renewables, drilling works, and other human activities that are not included in the categories above but are known to cause the emission of underwater noise, for example in the case of coastal works such as the construction of coastal routes, bridges, etc.

Overall, this is the same categorisation used for the report done in 2016; however, we did not spend time in looking for low and mid frequency sonar data, as these are mainly used for military exercise and we considered that this report was not the right opportunity to start an initiative aimed at collecting information about military exercises involving the use of sonar.

As the work is still ongoing (especially the analysis phase), this chapter reports about early information which is already available. Some plots of raw data are also provided for data which are already consolidated.

A total of 89 different ports (out of 286 ports listed) were found in which dredging, pile driving, drilling and/or explosive activities were carried out; see Fig. 8. An absence of work in certain ports does not necessarily mean that these ports do not carry out any works. This may mean that some have more detailed data that are available to the public, while some do not have any.



Figure 8. A map of ports in the Mediterranean Sea in which noise-producing activities were carried out in 2016-2020. Ports are indicated with blue dot and the different sizes indicate the number of works present.

Data concerning seismic surveys are not yet consolidated and are not shown here. However, seismic exploration activities appear more concentrated on the eastern and south-eastern part of the Mediterranean Sea. Little to no data were found regarding seismic surveys in the western Mediterranean basin.

With regards to offshore and coastal works (other than ports), such type of works consists of data about offshore drillings of oil and gas, windfarm development projects, offshore bridge and land extension. Overall, the exact location in which drillings were done were insufficient. Therefore, most of the activities done were not be able to be plotted in the map. The only accurate information obtained on wind farm was about one project located in southern Italy and started to be installed in 2019. There is one information found on land extension, which is located in Monaco. In addition to that, there is an offshore work done for a bridge construction in Turkey.

The first rough plot of available information about offshore and coastal works is presented in the Fig. 10.



Figure 9. First rough map of known positions of coastal and offshore works that were done in the Mediterranean Sea in 2016-2020. The purple dots and polygons indicate the locations of the offshore and coastal works.

2.2.1. Ongoing work and first overview on the updated Noise Hotspot data

Compared to the first Noise Hotspots (2016), the data collection done in 2020 was more precise, especially as regards the ports. Construction and extension works were better inventoried, and they appear as the most widespread source of underwater noise in the Mediterranean basin. Also, seismic surveys appear to concentrate to the eastern basin in the 2016-2020 period, but further data analyses are needed (and planned for the coming months) to confirm this first impression. The same goes for offshore and other coastal works despite early plots show that these noise-generating activities may contribute less than ports and seismic to the overall picture. Finally, to increase the chance to gather data about the use of low and mid frequency sonar use, the recommendation is to look at the process initiated by the ACCOBAMS Secretariat in 2019 with the organisation of a first successful workshop gathering two navies and several stakeholders of the issue of sonar emissions and their impact on cetaceans. This process has, in our opinion, the potential for leading in reasonable times to gather first relevant data about the use of low and mid frequency sonars in the Mediterranean area.

2.2.2. Limits and shortcomings of this study

This study suffered of the same limitations of the 2016 Noise Hotspots report: it is far from being complete and it should not be considered exhaustive. Also, it is considered that without an active involvement and engagement from countries, the effort of collecting data cannot be effectively improved. For this reason, during QUIETMED2, a dedicated workshop for French-speaking countries of the Mediterranean area was organised. A chapter is dedicated to this matter later in this document.

2.2.3. Where to find the Noise Hotspots data updated in 2020

Data are still at the analysis phase and are not available yet. **They cannot be used without the ACCOBAMS permission until the public release.** Data will be then available on the ACCOBAMS Digital Platform: <https://accobams.sinay.fr>. Further information can be requested to the ACCOBAMS Secretariat.

EmodNet will be also been informed as soon as the work will be finished.

3. Additional data search during QUIETMED2

3.1. The 1st Call for Data

In July 2020, The Secretariats of ACCOBAMS and SPA/RAC prepared and launched a Call for Data (see Annex for the complete document) to start gathering noise event data. The Data Call was launched in English in July 2020. The same Data Call is planned to be issued in French in January 2021.

In Data Call, ACCOBAMS and SPA/RAC Focal Points are requested to provide, on a voluntary basis, the data concerning noise events produced by the following maritime activities in their country:

- ◆ Seismic surveys conducted with airguns for hydrocarbon exploration and for geophysical studies.
- ◆ Offshore and coastal works (including in harbours) using the following techniques:
 - Pile driving
 - Underwater explosions
- ◆ Sonar use (low and mid-frequencies)
- ◆ Activities using other loud noise sources (drilling, vibro-piling, etc.)

The results of the call (July 2020, English version) were the following:

- ◆ 1 country (Malta) responded positively and was able to prepare and upload data on the ACCOBAMS Register.
- ◆ 1 country (France) responded promising to upload new data on the ACCOBAMS register as soon as these data will be ready (France was the only country having submitted impulsive noise data before the Data Call, voluntarily).

3.2. The “French workshop” and first data collection in non-EU Member States

On December 14th and 15th, 2020 a workshop was held in videoconference with delegates and scientists from Morocco, Algeria, Tunisia, Lebanon as well as Monaco. The workshop was organized by the Secretariats of ACCOBAMS and RAC/SPA and implemented a request received from those countries during another QUIETMED-2 meeting: the 2nd training with competent authorities on new regionally coordinated measures, held in video conference on September 10th and 11th.

The main objectives of this workshop were the following:

- ◆ Make clear for people who are more familiar with French to understand the basic concepts of the MSFD/EcAP cycle with regards to Underwater Noise.
- ◆ Train participants to the first step to set up a national noise register.
- ◆ Promote and train participants to share noise event data through the International Noise Register of ACCOBAMS.

Key results of the workshop were the following:

- ◆ Focal points to ACCOBAMS or SPA/RAC from Morocco, Lebanon and Tunisia attended the workshop, ensuring a political relevance of the event.
- ◆ The ACCOBAMS Focal Point of Lebanon shared data on the explosion happened in the port of Beirut on August 4th, 2020.
- ◆ Experts from Algeria and Morocco presented a first review of publicly available information about noise events occurring in their countries.
- ◆ Test data entry was carried out by experts from Morocco and Algeria by using the standard form available in the ACCOBAMS Noise Register. This information will be download on the register as soon as it will be validated by competent authorities.

3.3. The ACCOBAMS Noise Register at the end of QUIETMED2

At the time of writing this Deliverable, the register database contains the data summarized in following table.

Table 2. Summary of data contained in the Register at December 15th, 2020.

Country	Geometry	Period	Noise event types
France	All Points	2016 2017	100% underwater explosions
Malta	All GFCM statistical rectangles	2016 2017	60% sonar, 40% airgun
Lebanon	Points	2020	100% Explosions
Test data (to be removed)	1 GFCM statistical rectangle 4 points	-	-

By looking at the map, the Register looks like depicted in Figure 11.

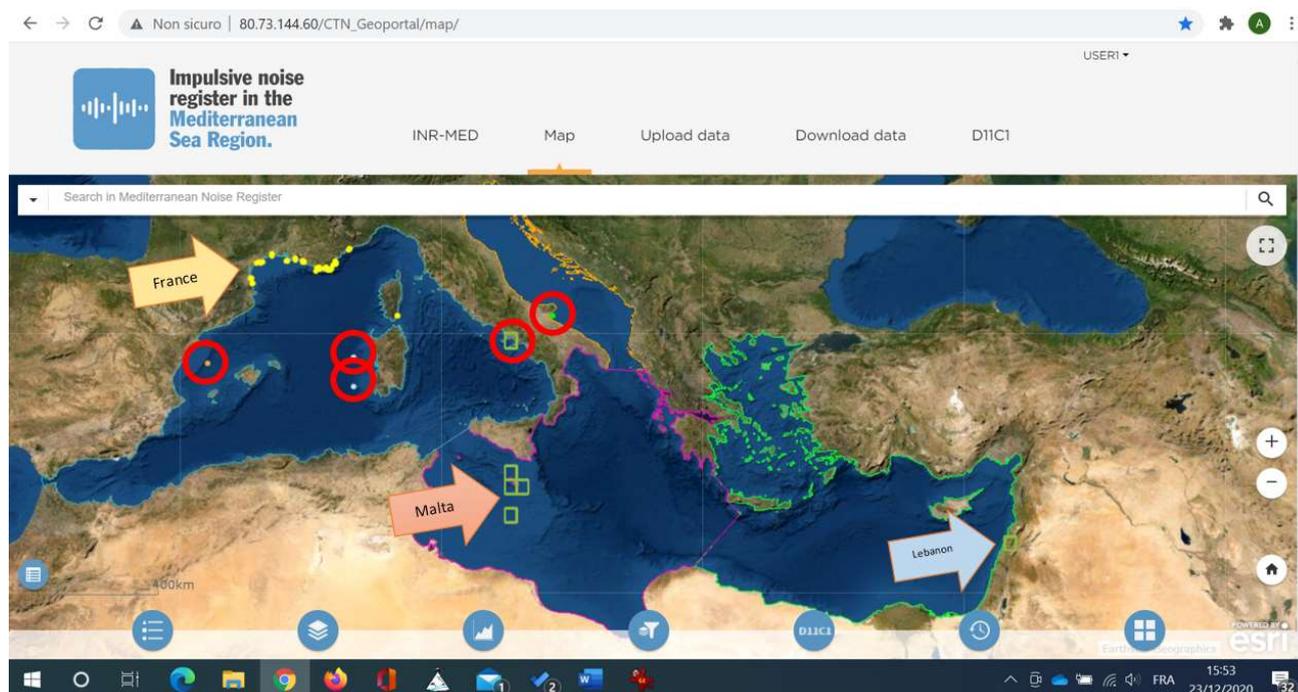


Figure 10. Yellow arrow: noise events from France. Orange arrow: noise events from Malta. Blue arrow: noise events in Lebanon. In the red circles there are some test data which will be removed from the Register database. Data from Malta were uploaded in response to the Data Call launched in July 2020. Noise events from Lebanon were uploaded following the French workshop held on 14-15 December 2020.

Further indicators can be displayed, including the spatial (Fig. 12 and 13) and temporal (Fig. 14) coverage of noise events over the regions and sub-regions. Bearing in mind that it is not the scope of this document to carry out an assessment of the environmental status of the Mediterranean region, for obvious reasons, few examples are shown hereafter representing merely the status of the ACCOBAMS Register at the time of writing.

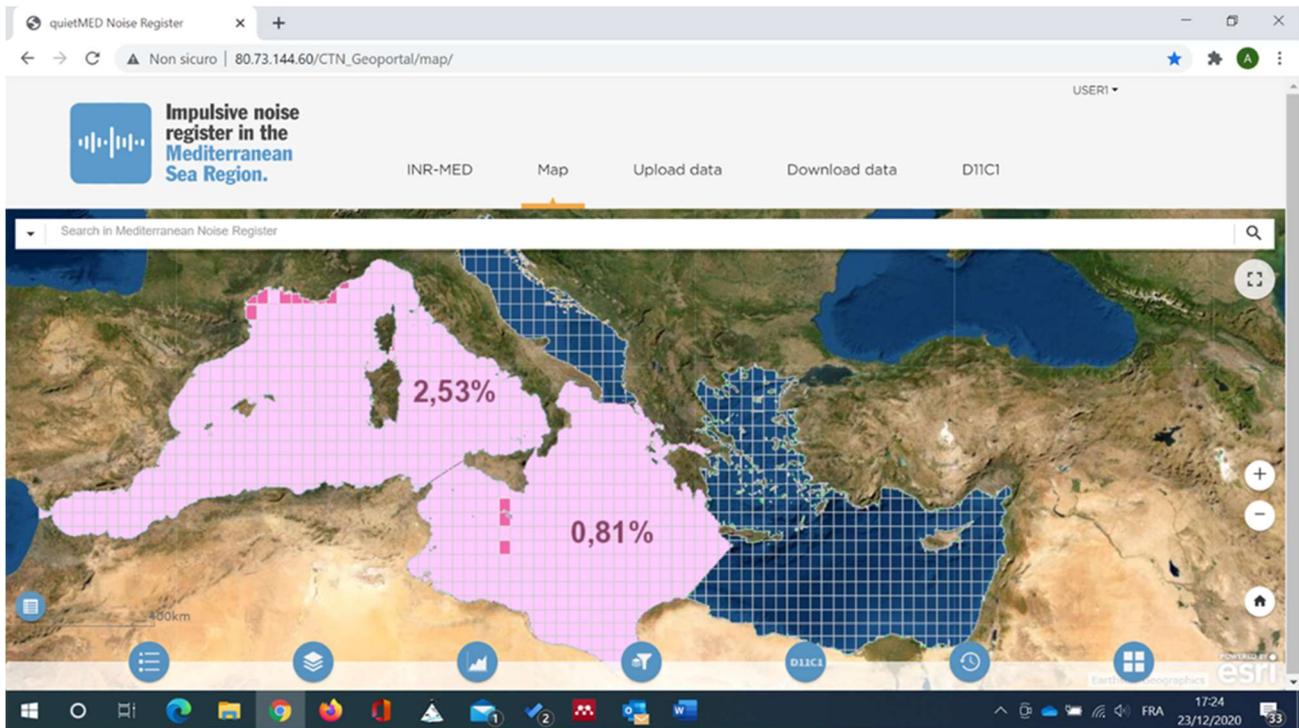


Figure 11. Proportion (%) of assessment area with impulsive noise events in 2016. The values are calculated as the ratio of the surface (km²) covered by noise events (dark pink cells) to the total surface (km²) of the assessment area. In this example, the assessment areas are the subregions. More information on how these values were calculated can be found in Deliverable 4.1 of QUIETMED (available from www.quietmed-project.eu).

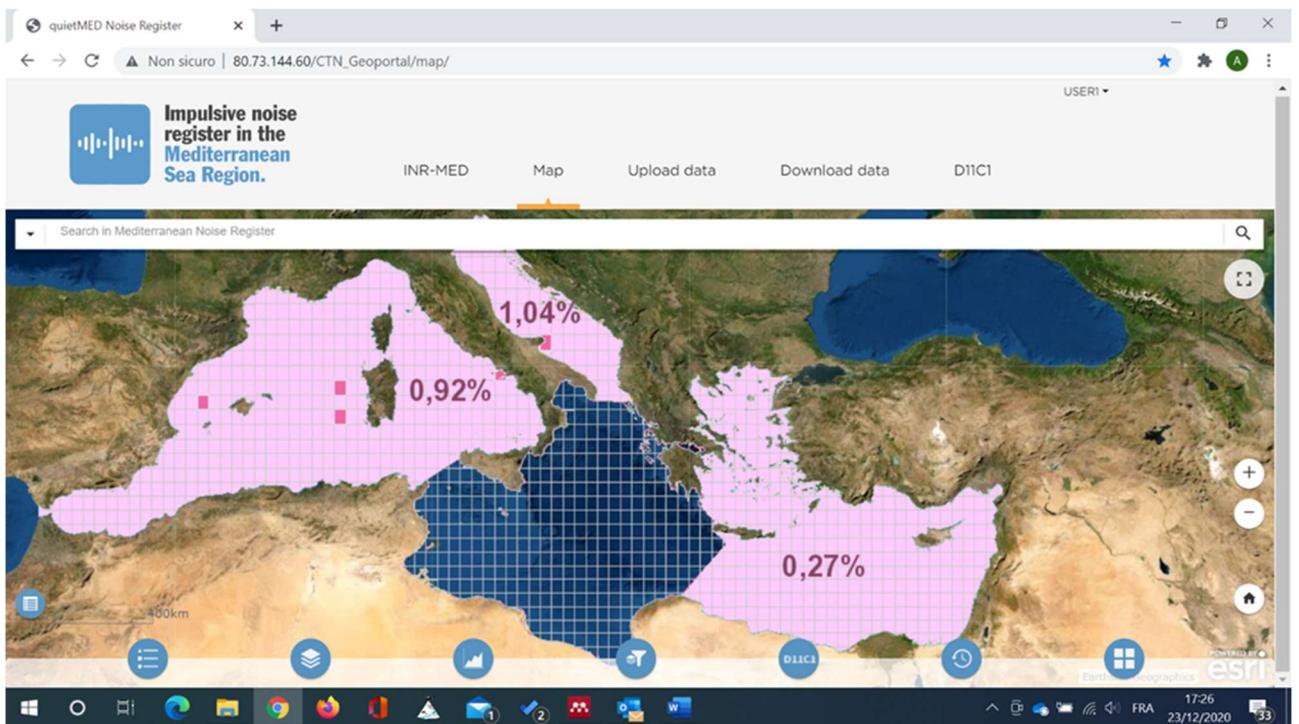


Figure 12. Proportion (%) of assessment area with impulsive noise events in 2020. N.B.: data from the Western Mediterranean and the Adriatic Sea are test data. More information on how these values were calculated can be found in Deliverable 4.1 of QUIETMED (available from www.quietmed-project.eu)

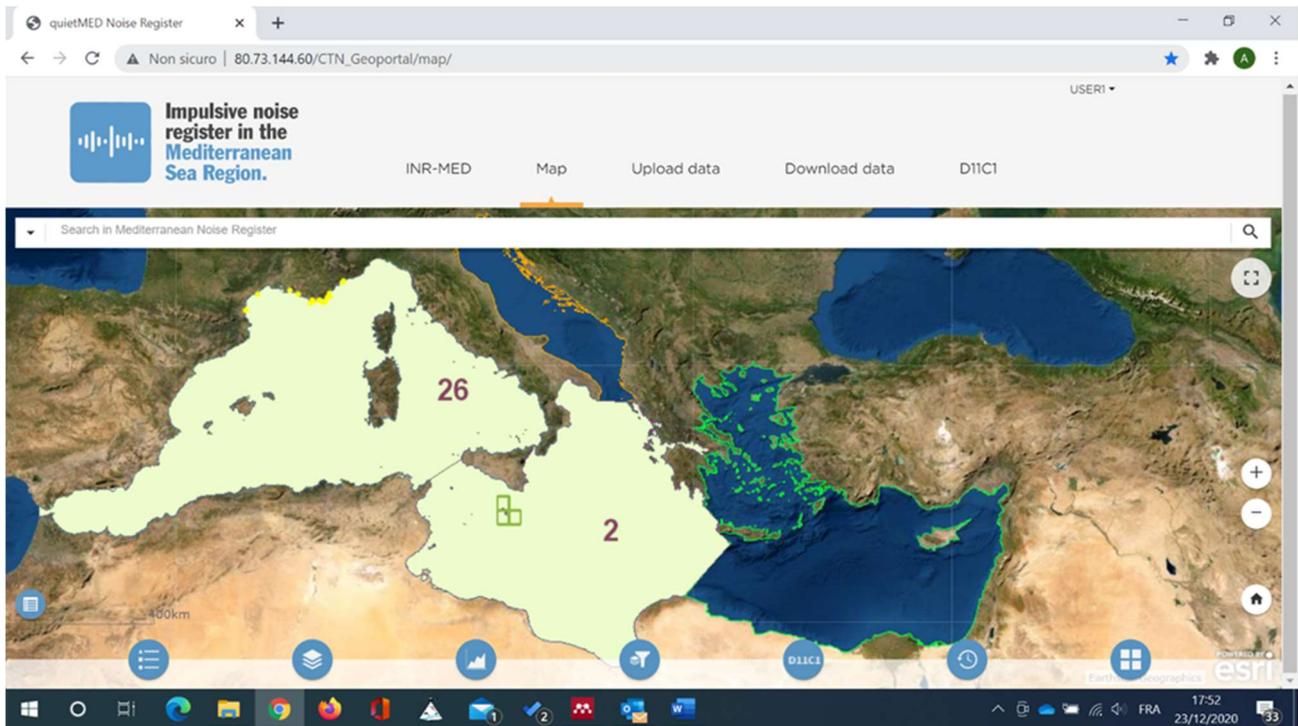


Figure 13. Number of days with noise events (pulse block-days) assessed per sub-region in 2017 based on available information. More information on how these values were calculated can be found in Deliverable 4.1 of QUIETMED (available from www.quietmed-project.eu)

4. Conclusions and next steps for GES assessment

This document reports about the first gathering of available noise event data in the Mediterranean area and draw first conclusions concerning their use for GES assessment.

Two main sources of data are considered: data collected independently from the MSFD and/or EcAp processes, i.e. the so called “Noise Hotspots data” of ACCOBAMS; and data collected within the MSFD and/or EcAp process (today available in the ACCOBAMS Noise Register):

- ◆ **With regards to data collected independently:** they could be considered at the national, subregional and regional level as background information about the distribution in time and space of impulsive noise sources in the past 15 years. But the limits and shortcomings should be clearly considered as well. For example, many of the explosions reported by France into the ACCOBAMS Noise Register were not found in publicly available information during the data collection phase of the Noise Hotspot update (which covers the period in which all the explosions reported by France in the Register occurred). Whereas the final report of the Noise Hotspot update will certainly cope to this gap with data from the Register, this may be impossible for countries that did not report any data yet. In the longer term, data collection initiatives like in the Noise Hotspot studies (report of 2016 and 2020 update) shall be replaced by structured data collection through the MSFD and EcAp frameworks.
- ◆ **With regards to data collected within the MSFD and/or EcAp process:** the data entered into the Noise Register could already be used to derive indicators relevant for D11C1 such as the proportion of area covered by noise events and the number of days with noise events, both indicators complying with the Commission Decision 2017/848. However, the amount of data collected during QUIETMED2 is by evidence not enough to carry out an assessment of the environmental status (GES assessment) of Mediterranean regions and subregions and a continued effort will be necessary to feed the Register regularly and with increasing engagement from countries (Member-States and Contracting Parties to ACCOBAMS and to the Barcelona Convention).

Moving towards GES assessment, it is necessary to understand that noise events data alone do not allow to produce robust assessments. Instead, a robust GES assessment will include not only noise event data, but also data on the habitat of selected species (cetaceans) following the methodology developed under Activity 6 of QUIETMED 2. In short, this methodology consists in assessing the exposure of habitats to noise events, where the exposure is calculated in terms of spatial and temporal coverage caused by noise events over all the potentially usable habitat area of species. The risk considered in QUIETMED2 is the risk of negative effects on cetacean populations to occur following exposure to noise events, where the risk is assumed to increase along with increasing spatial and temporal exposure to noise events. In the end, this methodology allows deriving threshold values for exposure and enables GES assessment, thus implementing the risk-based approach for assessment as defined in Deliverable 4.1 of QUIETMED2. The approach and the detailed methodology are explained extensively in Deliverables 4.1 and 6.2 of QUIETMED2, where the latter include virtual examples of implementation. Further examples of implementation are found in Deliverable 9.2 of QUIETMED2 which focuses on the development of a web tool for regional and subregional monitoring and assessment.

In conclusion, all the necessary tools and methodologies for monitoring and assessing impulsive noise have now been defined and a first round of noise event data was gathered and stored into the international noise register of ACCOBAMS. To complete this picture, data on the distribution of impulsive noise sources can be made available by ACCOBAMS covering the period 2005 – 2020, despite these data have known

shortcomings, in order to help drawing a reference state or baselines levels¹. Therefore, all the elements are now there to fully implement D11C1 at the national and regional levels.

Two main actions will be needed in the next future:

- The continuation and improvement of the Data Call process. This initiative proved its usefulness during this Activity 9, not only because it allowed the collection of some data, but also because it appeared as a mean to increase the engagement of countries in the Mediterranean area.
- The continuation of the workshops and training to be done in French for southern and eastern Mediterranean countries, especially for the EcAp implementation, as this initiative also proved its effectiveness in increasing awareness and commitment from stakeholders in such countries. It allowed indeed a little but important result represented by the first noise event from non-EU countries of the Mediterranean now stored into the ACCOBAMS Register.

¹ A scientific debate still exist concerning the definition of “reference state” and “baseline levels” within TG-Noise. In this work we use the definitions used by WG-GES in the document “*Common Understanding of (Initial) Assessment , Determination of Good Environmental Status (GES) & Establishment of Environmental Targets*” (Claussen et al., 2011)

5. Annexes

5.1. 1st Data Call on Impulsive Noise Events in the Mediterranean region

1st DATA CALL on Impulsive Noise Events in the Mediterranean region



Mediterranean
Action Plan
Barcelona
Convention



quietMED₂



Co-funded by the
European Union

QUIETMED2 – Joint programme for GES assessment on D11 - noise in the Mediterranean Marine Region.

Launch date:	28/07/2020
Reference QUIETMED2 Activity:	Activities 8 and 9
Duration:	Until 31/12/2020
Call:	DG ENV/MSFD 2018
Grant Agreement:	No. 110661/2018/794481/SUB/ENV.C2

This data call is launched in the framework of [the QUIETMED2 project](#), co-funded by the European Union.

Diffusion list:

- ACCOBAMS Focal Points
- SPA/RAC Focal Points
- MAP Focal Points
-

Subject: Gathering data on Impulsive Noise Events in the Mediterranean region to support the implementation of [MSFD-D11C1](#) and [EcAp/IMAP Common Indicator 26](#).

Use of the data: The gathered data will contribute to the monitoring and assessment of impulsive noise in the Mediterranean region by the ACCOBAMS Permanent Secretariat and the related experts group. Impulsive noise events data will be used to feed the [International Noise Register for the Mediterranean Sea region \(INR-MED\)](#).

Framework: The following legal background affords the secretariat of ACCOBAMS with the support of the UNEP-MAP-SPA/RAC, the competence to address and manage the impact of anthropogenic underwater noise in the Mediterranean Sea:

- Six Resolutions on noise management and mitigation adopted by the ACCOBAMS Parties², and the Resolution related to the Working Programme that provides for the establishment of a common database on impulsive noise sources during the 2017-2019 period (more information on www.accobams.org)
- A Memorandum of Understanding in place since 2016 between the Secretariats of ACCOBAMS and the UNEP/MAP-Barcelona Convention on issues concerning underwater noise and cetaceans. This MoU reinforces the cooperation between the two organisations, particularly concerning the the Mediterranean Integrated Monitoring and Assessment Programme (IMAP implementation of the IMAP/EcAp). Within IMAP, impulsive noise is addressed by the Common Indicator 26 (more information on www.unenvironment.org).

² 24 countries, including 8 EU-Member States in the Mediterranean are Parties to ACCOBAMS

Scope of the Data call

This data call is promoted by ACCOBAMS and SPA/RAC and is *one of activity 8 of the project QUIETMED2: Development of an efficient data and information tool to support the update monitoring programmes of impulsive noise impact indicator based on the current MED Region Joint Register of Impulsive Noise developed under QUIETMED*”

ACCOBAMS and SPA/RAC Focal Points are requested to provide, on a voluntary basis, the data concerning noise events produced by the following human activities:

- Seismic surveys conducted with airguns for hydrocarbon exploration of geophysical studies
- Offshore and coastal works (including in harbours) using the following techniques:
 - o Pile driving
 - o Underwater explosions
- Sonar use (low and mid-frequencies)
- Activities using other loud noise sources (drilling, vibro-piling, etc.)

Data will be used to feed the INR-MED which is currently visible at the following webpage: http://80.73.144.60/CTN_Geoportal/map/

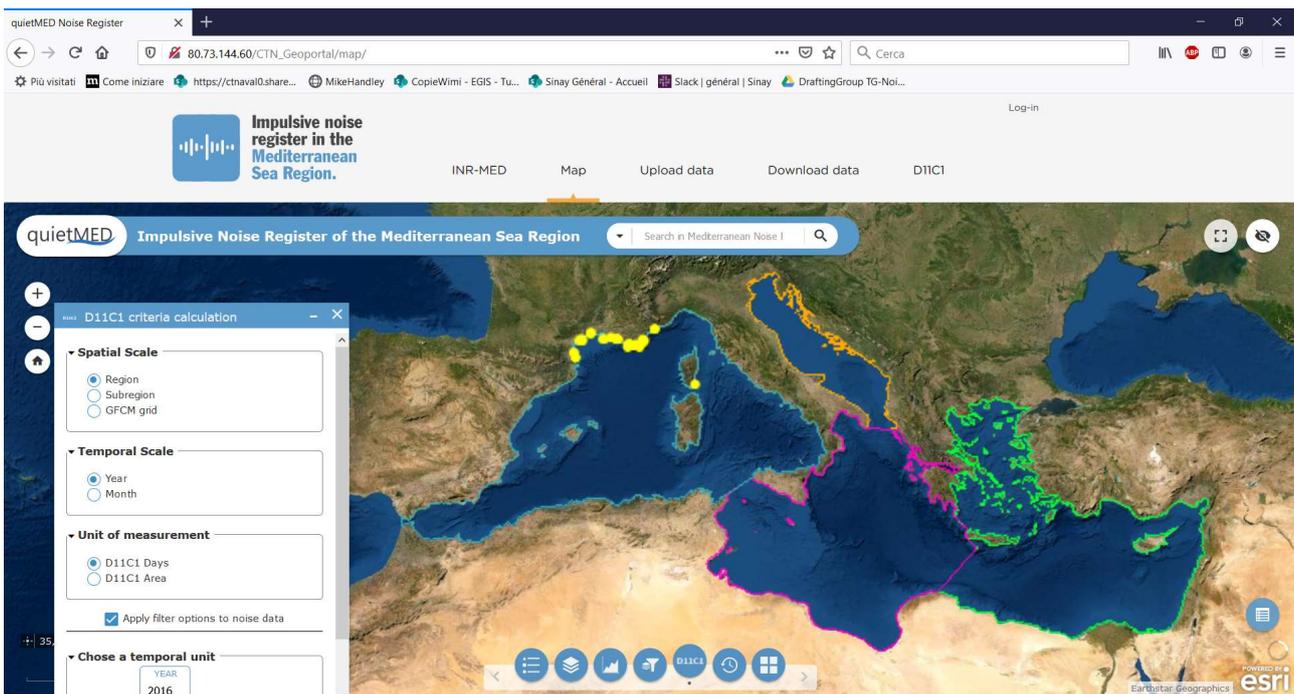


Figure 1; Current version of the International Noise Register in the Mediterranean Sea region, showing data from France for 2017.

Definition of noise events

An impulsive noise event (simply named *noise event* hereinafter) is the occurrence of one or more loud transient sounds of short duration in the sea. Such definition includes pulse signals (such as those produced by airguns, explosions, and pile driving) and non-pulse signals (such as sonars). Noise events are assessed in

time and space, i.e. we want to compute how many days and how much maritime surface with noise events over a time window and over an assessment area. With more details:

- 1 noise event is the occurrence of 1 or more impulsive sounds
- The minimum duration of a noise event is 1 day: at least 1 impulsive sound is emitted during that day (e.g. an explosion)
- When noise events last more than 1 day, then at least 1 impulsive sound is assumed to be produced for each day of duration of the noise event
- Noise events are always linked to a geographical reference: a point, a line or a polygon.

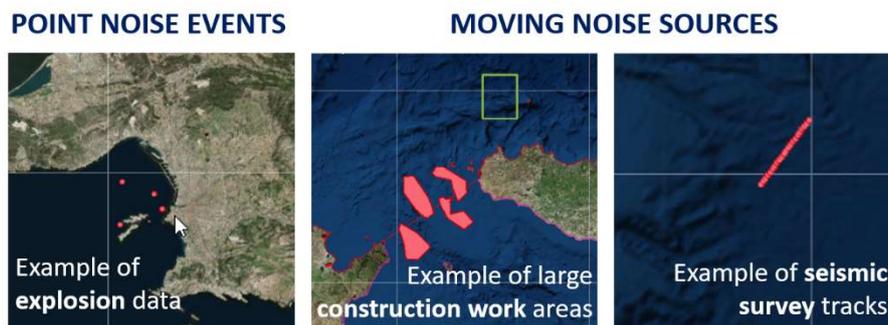


Figure 2. Example of noise events reported in points, polygons or lines.

Noise events are produced by many human activities. For this Data Call we are especially interested in the following:

- **Pile driving.** Pile driving is a conventional technique employed in many coastal and offshore constructions, such as wind farms, offshore platforms, harbour extensions etc.
- **Airgun.** The airgun is presently the most employed technology during seismic surveys. Such surveys are conducted for hydrocarbon exploration of the geophysical studies.
- **Explosives.** Underwater detonations may occur for the disposal of explosives or may be planned during maritime construction, e.g. to fragment rock prior to dredging.
- **Sonar.** Low-, mid- and high frequency active sonars (LFAS, MFAS, HFAS) are employed during military exercises as well as during academic and industrial surveys, such as fish stock estimations and bathymetric surveys.

Countries may consider further sources, as the register is conceived to provide an overview of all loud underwater sound sources. Hence, sparkers, boomers, echo-sounders, chirps, and more sources may be considered of interest and included in the monitoring programme of impulsive noise.

Data to report

The information required to feed the register is summarised in the following table.

Table 3. Data to report to the INR-MED

Data	Units and/or comments	Priority
Position	geographic position (lat/long) or pre-defined block/area which can be identified through a coding system (single identifier for each block used)	Required
Dates	Start and end day	Required
Intensity	Source level in decibels (db) or other quantity linked to intensity (eg. kg of TNT for explosions, Joules for Pile Driving, etc.)	Required
Source spectrum	Frequency range	Additional
Source depth	meters	Additional
Platform speed	m/s or knots, for moving sources like seismic surveys	Additional

Data compiling

Data should be compiled using the online form (Excel sheet) which can be downloaded here:

http://80.73.144.60/data_upload_template_INRMED.xlsm

Data submission instruction

A simple submission procedure is established:

1. Fulfil the required fields of the Excel sheet following the instructions inside.
2. Transform the excel file in a XML file following the instructions of the template.
3. Save the XML file generated.
4. Upload the generated XML file using the upload box in this webpage:
http://80.73.144.60/CTN_Geoportal/upload/ (see figure below)

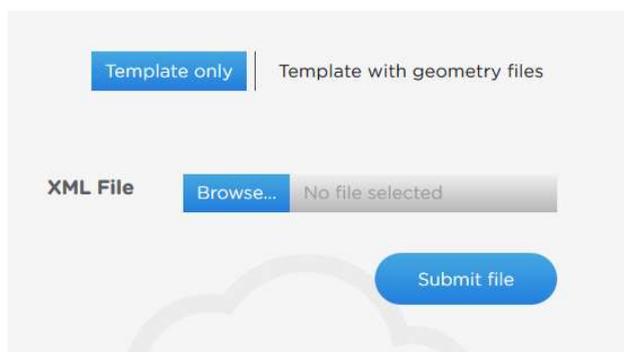


Figure 3. Upload bow available at http://80.73.144.60/CTN_Geoportal/upload/ . Note the possibility of also uploading GIS files (geometries), according to the available data.



5. If the upload process is successful, the application will show the message “Data uploaded successfully”.
6. Your data are printed in the map (http://80.73.144.60/CTN_Geoportal/map/).

Questions:

For questions about the content of the data call, please contact: msalivas@accobam.net. For support concerning the compiling of data and its submission please contact: alessio.maglio@sinay.fr

5.2. 1er Appel à données sur le bruit impulsif en Méditerranée

1^{er} Appel à données
sur le bruit impulsif en
MéditerranéeMediterranean
Action Plan
Barcelona
Convention

QUIETMED – Programme conjoint sur le bruit (Descripteur 11) pour la mise en œuvre du deuxième cycle de la DCSMM en Méditerranée.

quietMED

Cofinancé par
l'Union Européenne

Date de lancement : 28/07/2020 (Anglais); 15/12/2020 (Français)
Echéance de l'Appel à données : 02/03/2021
Référence appel à projet: DG ENV/MSFD 2018
Accord de financement n°: No. 110661/2018/794481/SUB/ENV.C2

Cet appel de données est lancé dans le cadre du projet [QUIETMED2](#), cofinancé par l'Union européenne.

Liste de diffusion :

- Points focaux ACCOBAMS
- Points focaux RAC/SPA
- Points focaux MAP

Objet : Collecte de données sur les événements sonores impulsifs dans la région méditerranéenne pour contribuer à la mise en œuvre du [descripteur 11 de la DCSMM](#) et de l'[indicateur commun 26](#) du Programme intégré de surveillance et d'évaluation de la Convention de Barcelone (IMAP).

Utilisation des données : Les données collectées contribueront à la surveillance et à l'évaluation du bruit impulsif dans la région méditerranéenne par le Secrétariat permanent de l'ACCOBAMS et son groupe d'experts en la matière. Les données sur les événements sonores impulsifs seront utilisées pour alimenter le Registre international du bruit pour la région Méditerranéenne ([INR-MED](#)).

Cadre juridique : la gestion de la problématique du bruit sous-marin est traitée par l'ACCOBAMS, en coopération avec le PNUE/PAM-SPA/RAC, suite aux dispositions contenues dans les textes énoncés ci-après :

- Six Résolutions sur la gestion et l'atténuation du bruit adoptées par les pays signataires (Parties) de l'Accord ACCOBAMS³ (Résolutions 2.10 ; 3.16 ; 4.17 ; 5.15 ; 6.18 ; 7.13)
- La Résolution relative au Programme de travail qui prévoit la création d'une base de données commune sur les sources de bruit impulsif pendant la période 2017-2019 (plus d'informations sur www.accobams.org)
- Un **protocole d'entente** en place depuis 2016 entre les Secrétariats de l'ACCOBAMS et la Convention PNUE/PAM-Convention de Barcelone sur les questions relatives au bruit sous-marin et aux cétacés. Ce protocole d'accord renforce la coopération entre les deux organisations, notamment en ce qui concerne le programme méditerranéen de surveillance et d'évaluation intégrées (mise en œuvre IMAP de l'IMAP/EcAp). Dans l'IMAP, le bruit impulsif est traité par l'indicateur commun 26 (plus d'informations sur www.unenvironment.org).

³ 24 pays, dont 8 États membres de l'UE en Méditerranée, sont parties à ACCOBAMS

Objectif de cet appel à données

Cet appel à données, promu par l'ACCOBAMS et le RAC/SPA, est lancé dans le cadre du projet QUIETMED2 et en particulier de l'activité nommée « Développement d'un outil pour les programmes de surveillance du bruit impulsif, basé sur l'actuel Registre commun de la Région méditerranéenne » (Activité 8 QUIETMED2).

Les points focaux ACCOBAMS et RAC/SPA sont invités à fournir, sur base volontaire, les données concernant les événements sonores générés par les activités humaines suivantes :

- Campagnes sismiques réalisés avec canons à air pour l'exploration d'hydrocarbures et pour les études géophysiques
- Travaux offshore et côtiers (y compris dans les ports) utilisant les techniques suivantes :
 - Battage de pieux
 - Explosions sous-marines
- Utilisation du sonar (basses et moyennes fréquences)
- Activités utilisant d'autres sources bruyantes (forage, vibro-pieux, etc.)

Les données seront utilisées pour alimenter l'INR-MED qui est actuellement accessible de la page Web suivante: http://80.73.144.60/CTN_Geoportal/map/

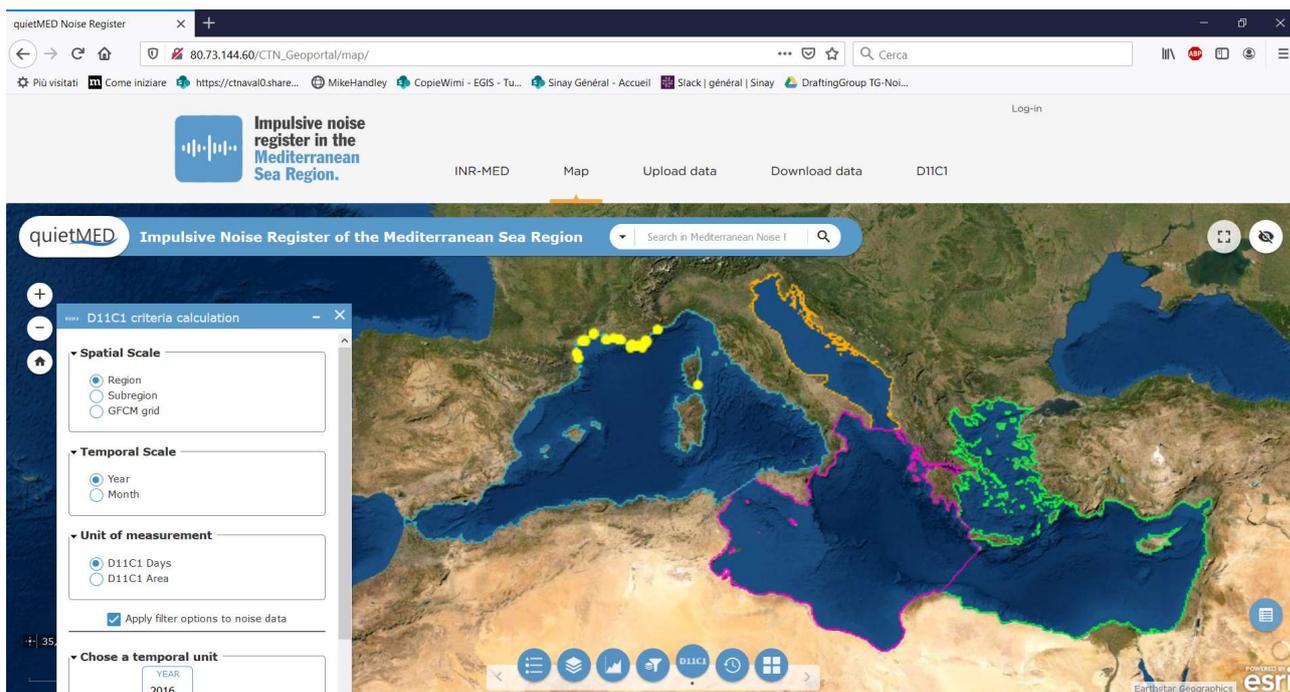


Figure 4; Version actuelle du Registre international du bruit en Méditerranée. Cette version montre les données de la France pour 2017.

Définition des événements sonores

Un événement de bruit impulsif (simplement appelé événement de bruit ci-après) est l'occurrence d'un ou plusieurs sons transitoires forts de courte durée dans la mer. Cette définition inclut les signaux impulsionnels (tels que ceux produits par les canons à air comprimé, les explosions et le battage de pieux) et les signaux non impulsionnels (tels que les sonars). Les événements de bruit sont évalués dans le temps et dans l'espace, c'est-à-dire que nous voulons calculer combien de jours et combien de surface maritime avec des événements de bruit sur une fenêtre temporelle et sur une zone d'évaluation. Avec plus de détails:

- 1 événement de bruit est l'occurrence d'un ou plusieurs sons impulsifs
- La durée minimale d'un événement sonore est de 1 jour : au moins 1 son impulsif est émis pendant cette journée (par exemple une explosion)
- Lorsque les événements de bruit durent plus d'un jour, alors au moins 1 son impulsif est supposé être produit pour chaque jour de durée de l'événement de bruit
- Les événements de bruit sont toujours liés à une référence géographique : un point, une ligne ou un polygone.

EVENEMENT PONCTUELS



SOURCES MOBILES



Figure 5. Exemple d'évènements sonores représentés par des points, des polygones ou des lignes.

Les événements sonores sont produits par de nombreuses activités humaines. Pour cet appel à données, l'intérêt principale porte sur les éléments suivants :

- **Battage de pieux.** Le battage de pieux est une technique conventionnelle utilisée dans de nombreuses constructions côtières et offshore, telles que les parcs éoliens, les plateformes offshore, les extensions portuaires, etc.
- **Canons air.** Le canon à air est actuellement la technologie la plus utilisée lors des campagnes d'acquisition sismique. Ces campagnes sont menées pour l'exploration d'hydrocarbures ou des études géophysiques.

- **Explosifs.** Des détonations sous-marines peuvent se produire pour l'élimination d'explosifs ou peuvent être planifiées pendant la construction maritime, par ex. briser la roche avant le dragage.
- **Sonar.** Les sonars actifs à basse, moyenne et haute fréquence (LFAS, MFAS, HFAS) sont utilisés pendant les exercices militaires ainsi que pour les études menées pour la recherche en géophysique, pour l'exploitation de ressources marines (par exemple les estimations de stocks de poissons et les levés bathymétriques).

Les pays peuvent considérer d'autres sources de bruit sous-marin, car l'objectif du registre est de fournir un aperçu global des sources sonores sous-marines d'origine anthropique émettant des signaux impulsifs. Par conséquent, les sparker et les boomers (deux types de source sismique pour les études géophysiques en milieu côtier), les échosondeurs, et d'autres sources peuvent être considérés et inclus dans le programme de surveillance du bruit impulsif.

Données

Les informations nécessaires pour alimenter le registre sont résumées dans le tableau suivant.

Tableau 4. Données à reporter dans le Registre

Donnée	Unité et/ou commentaires	Priorité
Position	Position géographique (lat/long) ou zone prédéfinie qui peut être identifiée avec un code spécifique (ex : un code unique pour chacun des zones prédéfinies utilisées)	Nécessaire
Dates	Début et fin des travaux (jour)	Nécessaire
Intensité	Niveau source en decibels (dB) ou autre quantité liée à l'intensité (ex : kg de TNT pour les explosions, Joules pour le battage de pieux, etc.)	Nécessaire
Spectre	Plage de fréquences	Optionnel
Profondeur de la source	Metres	Optionnel
Vitesse de la plateforme (ex : navire)	m/s ou noeuds (for sources mobiles comme les campagnes sismiques)	Optionnel

Saisir les données dans le formulaire approprié

Les données doivent être compilées à l'aide du formulaire en ligne (**feuille Excel**) qui peut être téléchargé ici :

http://80.73.144.60/data_upload_template_INRMED.xlsm

Instructions pour charger les données dans le registre

Une procédure simple et définie :

1. Remplissez les champs obligatoires de la feuille Excel en suivant les instructions à l'intérieur.
2. Transformez le fichier Excel en fichier XML en suivant les instructions du modèle.
3. Enregistrez le fichier XML généré.
4. Téléchargez le fichier XML généré à l'aide de la boîte de téléchargement de cette page Web :

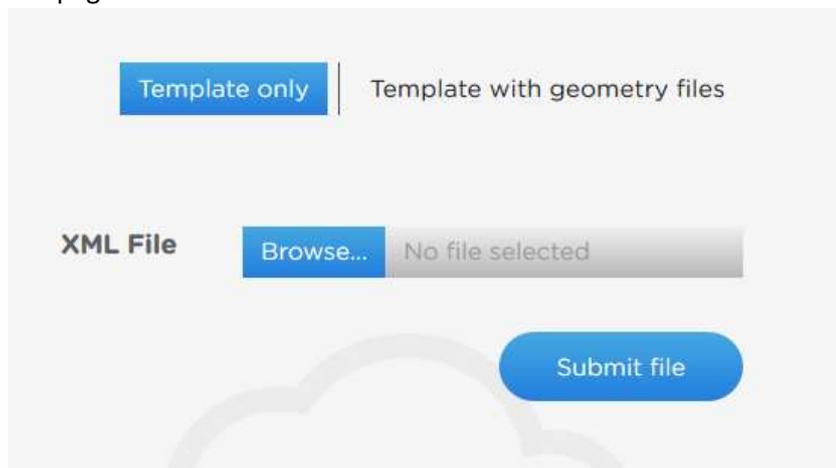


Figure 6. Téléchargement est à effectuer sur http://80.73.144.60/CTN_Geoportal/upload/. A noter la possibilité de télécharger également des fichiers SIG (géométries), en fonction des données disponibles.

5. Si le processus de téléchargement réussit, l'application affichera le message « Données téléchargées avec succès » (*Data submitted successfully*).
6. Vos données sont visualisées sur la carte (http://80.73.144.60/CTN_Geoportal/map/).

Questions et renseignements :

Pour toute question sur le contenu de l'appel à données, veuillez contacter msalivas@accobams.net.

Pour obtenir de l'aide concernant la compilation des données et leur dépôt en ligne, veuillez contacter : alessio.maglio@sinay.fr