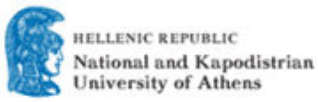
EMODnet

European Marine Observation and Data Network

SEA BASIN CHECKPOINT
Tender no MARE/2014/09-LOT4

D 17.4 Interim report

How Black Sea Basin CheckPoint to be operated after contract



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Executive Summary

The purpose of this report is first to summaries what has been achieved in the Black Sea Checkpoint project till now as well as which part of the outcomes can be maintained after the contract, and second, based on the project results and project experts and stakeholders opinion, to give suggestions on the future needs on data access, readiness for use, gaps as well as future needs on fitness-for-the-purpose assessment, new challenge areas and potential benefits from EMODnet Sea Basin Check Point projects on a sustainable and integrated European Ocean Observing System (EOOS).

1. Introduction

The basic aim of the EMODnet Checkpoints is to assess how well the available marine monitoring data in the Black Sea meet the needs of institutional stakeholders and policy makers as well as inform the data providers of the adequacy of their data supply chain. The EMODnet Black Sea Checkpoint approach consists of assessing the basin-scale monitoring data sets on the basis of the quality of Targeted products done for Challenges defined in the DGMARE Tender, that are: CH1-Windfarm Siting, CH2-Marine Protected Areas, CH3-Oil Platform Leak, CH4-Climate, CH5-Coasts, CH6-Fishery Management, CH7-Fishery Impacts, CH8-Eutrophication, CH9-River Inputs, CH10-Bathymetry, CH11-Alien species. Nevertheless that the project is "on the middle of the way" this report is trying to present our opinion how the Black Sea Checkpoint to be operated after contract. The vision presented is based on the results of the work done till now and on the previous experience of the project experts.

2. What was done

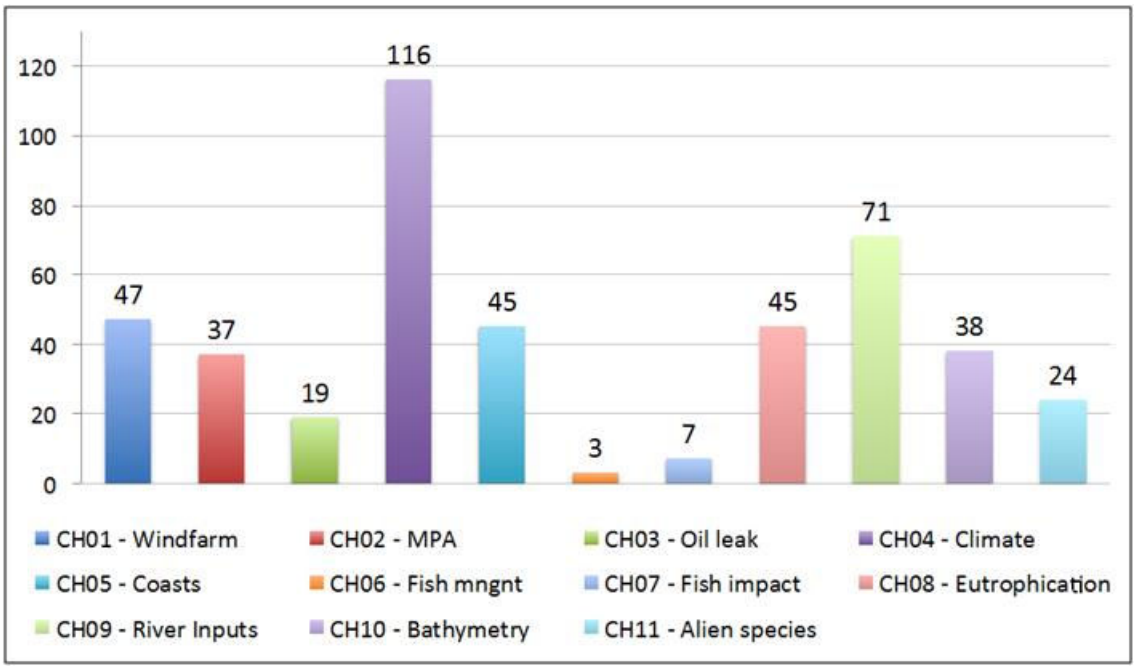
Literature Review

The Literature Survey has defined the Black Sea Checkpoint framework for "Data Adequacy „ assessment, based upon the ISO and ISPIRE international standards and adapted to the Checkpoint needs. The Literature Survey builds on the vocabulary definition and the methodology developed for the Mediterranean Sea Checkpoint, followed also by the Atlantic Checkpoint.

A total of 56 input data providers have been identified as International, European, EU Member States, Russia and USA and Projects. In total, they provide about 400 input data sets to be used and selected on the basis of the Targeted product requirements (still to be fully defined).

To advance in the understanding of the monitoring capacity in the Black Sea, an overview of 19 European, International and Member State programs has been carried out.

Next figure shows the number of input data sets found for each challenge (total number is 452).



In order to progress toward an assessment of the "data adequacy", 24 Use Cases related to Challenge Targeted Products were described from the literature. Use Case products have been analyzed in order to extract information about availability and appropriateness elements.

Among the 24 Use Cases, the main appropriateness elements that experts extracted from the literature were referred to as: 1) spatial resolution and area coverage; 2) temporal resolution and

extent. There is actually only one Use Case that refers to accuracy and it is for the river runoff data.

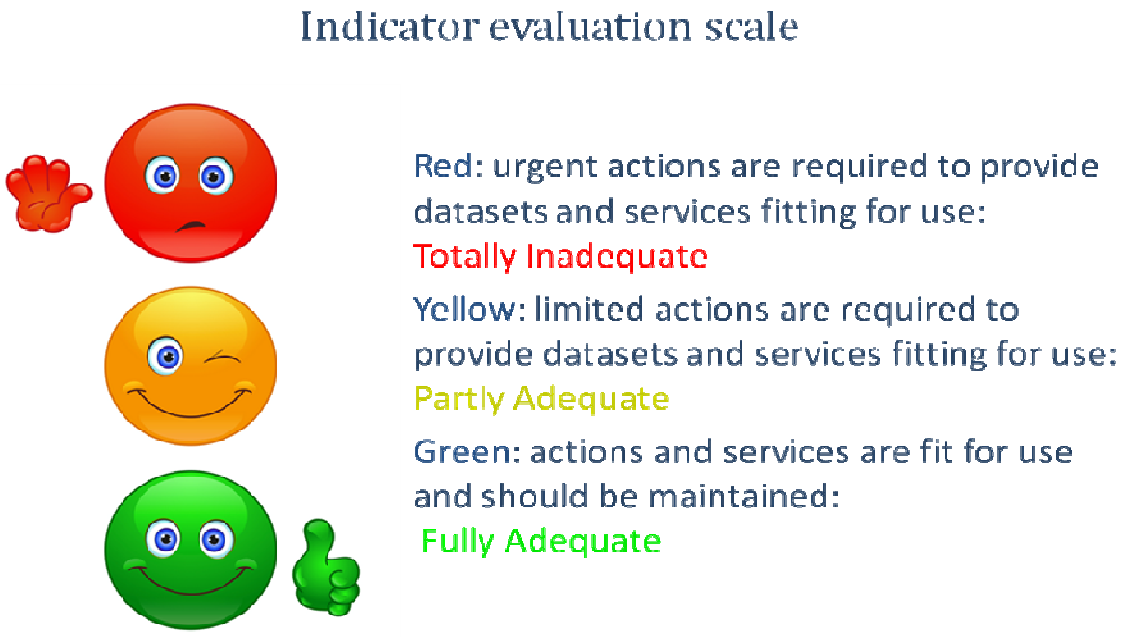
For all 24 Use cases, data availability is generally high except for accessibility which sometimes requires specific agreements with the data owners or is completely restricted.

In conclusion, the Literature survey shows that a large amount of input data sets exists at the basin scale level, so that a basin scale overview of the Black Sea monitoring system is available.

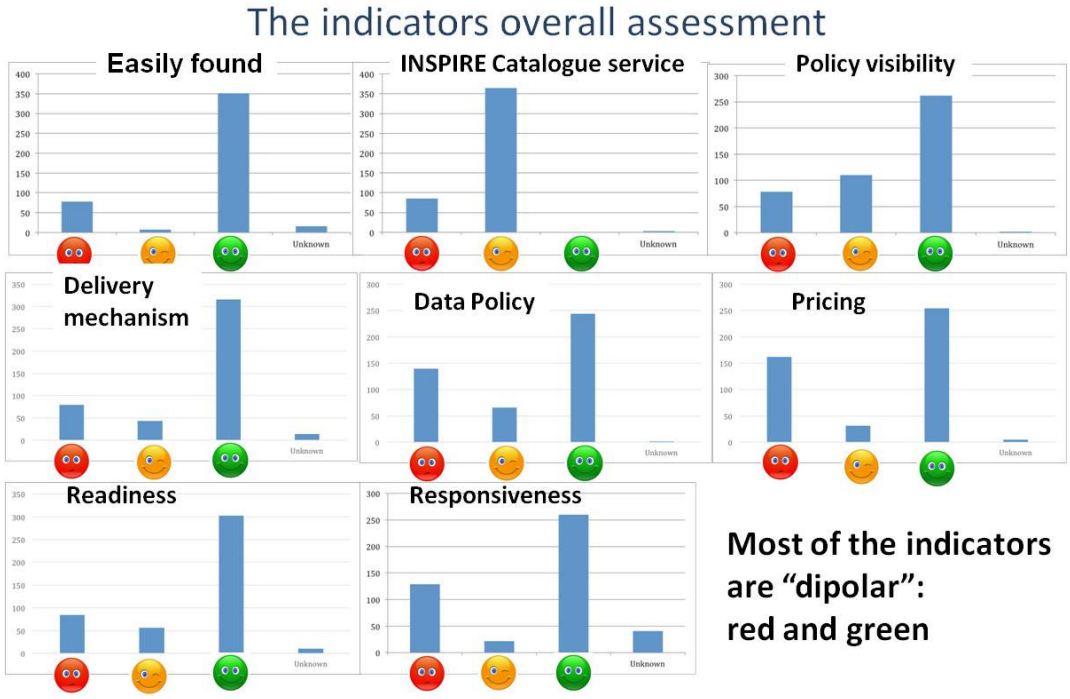
First DAR

The aim of theBlack Sea Checkpoint Data Adequacy Report (DAR) is to assess the basin scale monitoring systems on the basis of input data sets for 11 prescribed by DGMARE Challenges. The CheckPoint adequacy relates to both the requirements as well as the needs of the Challenges and was developed considering the ISO 9001 Quality Management System.

In the first DAR only the "availability" indicators are explored and analyzed to answer the question: "How the data is made available to the Challenges". Eighth availability indicators have been discussed and analyzed based upon a three value range: red, yellow and green. The following evaluation scale was used:



Overall assessment of the availability indicators is shown on the next figure:



Top 7 most requested monitoring characteristics by the Challenges
(more than 3 Challenges require them):
1. TEMP/Temperature of the water column
2. MBAN/Bathymetry and elevation
3. ASLV/Sea level
4. NTRA/Nitrate concentration parameters in the water column
5. PHOS/Phosphate concentration parameters in the water column
6. TDNT/Dissolved total and organic nitrogen concentrations in the water column
7. RFVL/Horizontal velocity of the water column (currents))

12 characteristic categories have the related datasets that are partly or not adequate in terms of availability:
1) TSED/Concentration of suspended particulate material in the water column
2) CRYS/Snow and Ice mass, thickness and extent
3) CAPH/pressure (measured variable)
4) CDTA/Air temperature and density
5) CHUM/Atmospheric humidity
6) CNTX/Phytoplankton generic biomass in water bodies
7) GP079/Zooplankton wet weight biomass
8) EWSB/Wind strength and direction
9) MBAN/Bathymetry and elevation
10) PSAL/Salinity in the water column
11) WVSP/Spectral wave data parameters
12) WVST/Wave height and period statistics

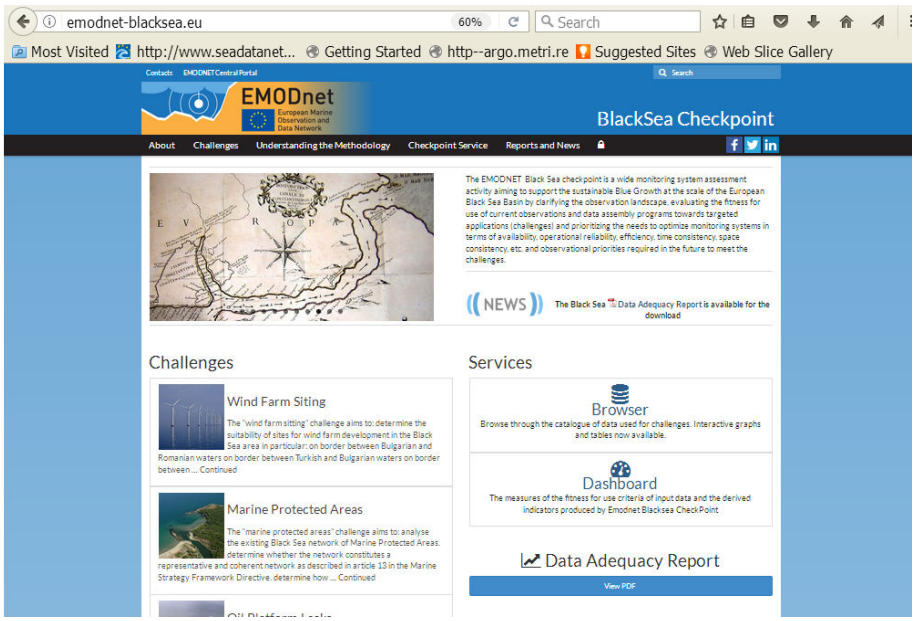
Targeted products

Sixty Target Data Products have been generated by integrating in-situ and satellite observations, model data and social-economic data. Most of the products defined in the tender can be generated. All the products will be presented through the Black Sea CheckPoint Data Portal. Firs analyses show that at least 13 products could not be produced due to lack of data (see next table).

Chalange	Number of Data sets	Number of Products	FORMAT			Prepared		Why can not prepared
			GIS	Excell	Other	Yes	No	
CH01: WINDFARM SITTING	44	3	3	0	2	3	0	
CH02: MARINE PROTECTED AREAS	41	4	4	0	0	4	0	
CH03: OIL PLATFORM LEAKS	19	2	0	0	2	2	0	
CH04: CLIMATE	121	18	12	6	0	10	8	No enough long data series
CH05: COASTS	46	10	4	7	0	7	3	No enough long data series
CH06: FISHERIES MANAGEMENT	3	3	0	7	0	3	0	
CH07: FISHERIES IMPACT	7	2	2	0	0	2	0	
CH08: EUTROPHICATION	45	1	1	0	0	1	0	
CH09: RIVER INPUTS	71	7	0	5	0	5	2	Not relevant for Black Sea
CH10: BATHYMETRY	42	4	4	0	0	4	0	
CH11: ALIEN SPECIES	71	6	2	1	5	6	0	
TOTAL	510	60	32	26	9	47	13	

Black Sea CheckPoint Web Portal

The Black Sea CheckPoint portal is operational and it is available at http://emodnet-blacksea.eu/. It presents a summary of the Black Sea Checkpoint goals and concept, Challenges, assessment Framework the achieved results. The Literature Review Report and the first Data Adequacy Report are available on the home page of the Black Sea CheckPoint:



3. Future needs

In terms of access to data

For some characteristics the input data sets are "difficult to find", they do not have an "INSPIRE catalogue service", most of the time the "data policy is not stated" and/or the "data are proprietary and/or there is no indication on how to get them". The indicators used by Black Sea Checkpoint that are showing the accessibility of data for each Challenge are as follows:

GREEN

- Use of open search engines, searching by name either the data provider or the characteristics
- Search via reference catalogue (e.g. Copernicus, GEOSS Geoportal…)

YELOW

- Use of social network, community of practices sharing information, portals of organization where no search is organized by an engine

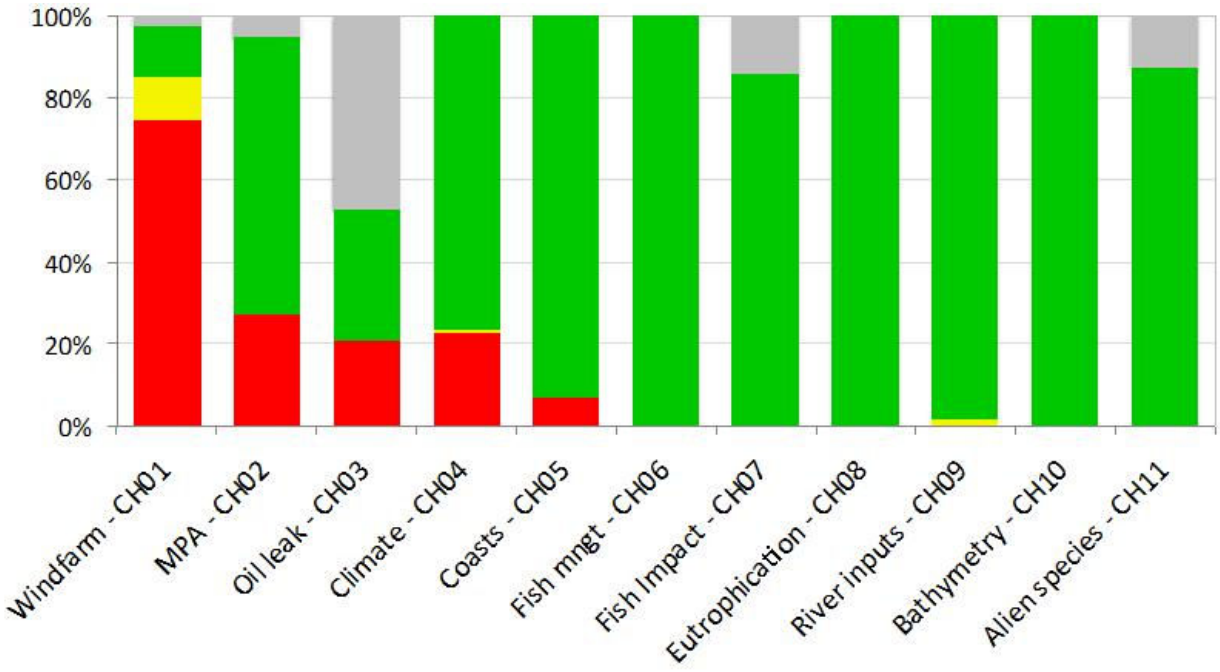
RED

- Cited in peer reviewed paper or grey literature but no information on how to access
- Information retrieved upon specific request to the data source

GREY

- Unknown

Next figure shows the results of the analysis for availability indicator "easy to find":



For some Challenges (CH1-Windfarm Siting, CH2-Marine Protected Areas, CH3-Oil Platform Leak, CH4-Climate, CH5-Coasts) there are still data sets that could be useful if the access to them can be provided. Data ingestion initiative could be also focused on filling gaps in historical data using information collected by Sea Basin Checkpoints.

Areas where monitoring is lacking

During Target Data Products generation it was found that for some products there are areas where monitoring data is lacking. More details on this issue will be available after finalizing the Second DAR.

On new challenge areas

European directives set new requirement on the marine monitoring. Implementation of Marine Strategy Directive and Marine Spatial Planning directive widened the need of the new monitoring parameters. Experts' opinion is that the new challenges for the Black Sea shall include also marine litter and underwater noise. Other important new challenge areas would be hypoxia, acidification and coastal pollutants.

4. Next steps

How could the Black Sea checkpoint feed into a EOOS

The European Ocean Observing System, EOOS, is a coordinating framework designed to align and integrate Europe's ocean observing capacity in the long-term; to promote a systematic and collaborative approach to collecting sustained information on the state and variability of our seas; and to underpin sustainable management of the marine environment and its resources. EOOS will be a framework and focal point to: Discuss and implement the Essential Ocean Variables (EOVs) for Europe; Bring together wider time-series of oceanic measurements (e.g. regular hydrographical, biological data sets); Share innovations and latest developments in ocean observation technology and best practice. Specifically, EOOS will: Align and connect existing initiatives to ensure efficiency and value for money; Identify gaps in the European observing capacity and foster initiatives to fill those gaps; Promote observing capacities which can benefit multiple sectors including research, policy, management and industry; Ensure that European ocean observing is integrated into the global observation system(s) by providing a focal point for interaction with international programmes (e.g. GOOS, GEOSS) and partner initiatives outside of Europe.

In this way, EOOS can help add value to existing observing efforts, empowering those who are already working to advance ocean observing in Europe, and catalysing new initiatives in a strategic way, targeting identified gaps and communicating progress to a wide range of

stakeholders. EOOS will act as a framework to bring the community together to set priorities and act as a single, well-organized voice for Europe, facilitating the exchange of best practice and capacity.

EOOS will also build on the work that has already been done to promote better coordination of ocean observations, both in Europe and internationally. The Framework for Ocean Observing, for example, a follow-up initiative of the OceanObs '09 conference, provides a useful template for developing a more integrated global observing system based on community collaboration and voluntary adherence to agreed Framework Concepts, including the use of Essential Ocean Variables (EOVs).

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EU's integrated maritime policy which work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products.

EMODnet Sea Basin Checkpoints (SBCP) assess the quality of the current observation monitoring data at the level of the regional sea-basins. By testing the data against specific end-user challenges, the checkpoints will demonstrate how well the current monitoring systems and data collection frameworks provide data to meet the needs of users. In doing so, data gaps and duplications as well as significant bottlenecks will be highlighted.

Sea Basin Checkpoints demonstrated data uses in a number of marine data application areas - Challenges. They also identified the existing gaps in available data used to produce marine products.

Black Sea Basin Checkpoint can contribute to EOOS on the regional level providing methodology and instruments already developed to: assess the quality of the current observation monitoring data; support observing strategy design and generate added value knowledge.

How to better organise monitoring in the future

The EMODnet "collect once and use many times" philosophy benefits all marine data users, including policy makers, scientists, private industry and the public. It has been estimated that such an integrated marine data policy will save at least one billion Euros per year, as well as opening up new opportunities for innovation and growth. The knowledge and experience already gathered in implementation of Black Sea Checkpoint could be used to organise future monitoring in more efficient way avoiding duplication of monitoring efforts as well as fragmented measurements. In the beginning the efforts on new data collection should be targeted to filling already identified existing data gaps in spatial and temporal extend. Future the focus will be moved to develop basin scale coordinated observing strategy based on user driven application areas – Challenges.

Recommendations for a more permanent structure for the EOOS

As was already mentioned, EOOS is a coordinating framework designed to align and integrate Europe's ocean observing capacity in the long-term. The synergy between the major European observing initiatives EMODnet, EuroGOOS and Copernicus will guarantee the success of EOOS. EOOS should be build on the best existing practises and follow the already proved standards. Such coordination should be archived not only on European level but also on basin scale level. The experience of EMODnet with SBCPs proves the efficiency of this approach.

Setup a permanent SBCP/monitoring service in the frame of EOOS

An important overarching function of the proposed EOOS will be to manage a dynamic and continually updated inventory of the ocean observing landscape. Such an inventory can provide an assessment of the spatial and temporal coverage and gaps for different types of observation infrastructure and capacity, measurements and data across all European sea basins. Hence, one of the first priority actions of EOOS as a coordinating framework will be to conduct an initial mapping of the system to determine the current baseline. This is a complex process because the requirements of the system are constantly changing and because there is imperfect information on the observing system elements.

Any inventory will need to take into account the extensive work already conducted by the community over recent years. For example, EOOS can build on the EMODnet Sea-basin Check-points that are currently examining observing system fitness for purpose, identifying how far scientific, societal or commercial questions can currently be answered by the present ocean observing system in each European sea basin.

How it will be at end of contract

The outcomes from the Black Sea Checkpoint project and the outputs (reports and products) are presented in the project website which also provides information about the project. The website is developed and maintained by CLS and hosted by IO-BAS. It is expected that the website can be maintained for several years after the end of the contract.

What would be next steps

At this stage, it can only be emphasized that assessments and Literature Surveys should be periodically carried out, because conclusions rapidly become obsolete in a changing marine environment and for the increasing needs of the 'blue' economy. The same could be said for produced products.