

# **EMODnet Black Sea Checkpoint Products**



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## Abstract

The aim of the EMODnet Black Sea Checkpoint project is to assess the basin scale monitoring systems on the basis of input data sets for 11 prescribed Challenges. The first step in this process was the definition of a "Data Adequacy Framework", which was derived from the ISO 9004:2009 standards. The second step in the analysis was to set up a meta database containing standardized information about the input datasets potentially usable by the Challenges to produce their products. The meta database is at the back-end of an INSPIRE Web and GIS platform, known as Sextant, and uses the SeaDataNet common vocabulary to identify the categories of characteristics needed by the Challenges and to analyze the statistics of indicators. More than 500 input data sets have been identified and used to produce 59 products in 11 prescribed Challenges which are mainly presented in GIS Shape files and excel tables. Desired products specifications and products description metadata together with upstream data sets metadata are loaded into Sextant for future statistical analysis. Preliminary analysis shows that for at least 13 products the input data will not be enough to produce products with relevant quality. Next step will be to assess the 'Appropriateness' in addition to 'Availability' of the monitoring data sets used to produce the Challenge outputs. In conclusion, it is worth mentioning that the Black Sea Checkpoint service, based upon the meta database and the GIS web portal, is coordinated with the Mediterranean Sea and the Atlantic Checkpoint so that the availability and appropriateness indicators analysis will be carried out in the same way in the three basins. This will allow users to differentiate in a near future between the data adequacy of the three basin-scale monitoring systems.

#### DATA ADEQUACY

Data adequacy: can be defined as the fitness for use of the data for a particular user or for a variety of users. Since different applications require different properties associated with the data itself, 'adequacy' should be defined objectively using standardized nomenclature and methods. Adequacy is here intended as 'sufficient to satisfy a requirement or meet a need'.

Territory 1: Availability	
How the input data sets are made available to Challenges	
DAR 1	
Territory 2: Appropriateness	
What is the quality of the monitoring data for the Challenge products	
DAR 2	

Appropriateness indicators are constructed by comparing the DPS (Data Product Specification) Quality Elements against the TDP (Targeted Data Product) and UD (Upstream Data) quality elements.

**Appropriateness quality elements nomenclature** 

### Black Sea Checkpoint Target Data Product

All the 11 Challenges generated 47 target data products but with different kind of "fitness" for purpose" due to different problems in the "fitness for use" of the input data set. 14 products were not achieved because of a lack of existing data.



Definitions	Name of Appropriateness Quality Elements						
Completeness							
Horizontal Spatial Coverage	AP-1-1						
Vertical Spatial Coverage	AP-1-2						
Temporal Coverage	AP-1-3						
Consistency							
Number of Characteristics	AP-2-1						
Accuracy							
Horizontal Resolution	AP-3-1						
Vertical Resolution	AP-3-2						
Temporal Resolution	AP-3-3						
Thematic Accuracy	AP-3-4						
Temporal Quality							
Temporal Validity	AV-4-1						

The basic idea of appropriateness indicators is that they are related to "errors" in the Quality Elements just defined. Appropriateness corresponds then to "low" errors in the specific quality element.

"Errors" for quality elements are defined as the differences between what has been realized and what was "expected" or "required". DPS includes the requirements or expectations while TDP and UD are the actual products and input data sets used respectively.

#### **Evaluation of Targeted Products from expert opinion**

The objective is to provide an expert evaluation of the "fitness for purpose and use" for each Targeted Product.

The challenge teams were asked to provide the following information:

- 1. Assign an overall product quality score with respect to scope (fitness for purpose) and explain why according to the scale in the next Table;
- 2. Explain what are the most important characteristics for the Targeted Product quality (if all characteristics are important please say so);
- 3. Explain what are the quality elements of the most important characteristics that affects the Targeted Product quality;
- 4. Explain the limitations on the quality of Targeted products due to the input data set used;
- 5. Explain which characteristics "fails the most" to meet the scope of the Targeted Product;
- 6. Provide an expert judgment to describe for each Targeted Product the most important gaps in the input data sets.

#### **Targeted Products quality scores and their meaning**

SCORE	NAME	MEANING
1	EXCELLENT	Completely meets the scope of the Targeted Product
2	VERY GOOD	Meets more than 70% of the scope of the Targeted Product
3	GOOD	Meets less than 50% of the scope of the Targeted Product
4	SUFFICIENT	Does not adequately meet the scope but is a starting point
5	INADEQUATE	Does not fulfill the scope and is not usable

#### **Experts' evaluation results**

CHALENGE	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11
NAME	Wind Farm Sitting	Marine Protected Areas	Oil platform leaks	Climate	Coasts	Fishery Management	Fishery Impact	Eutrophication	River Inputs	Bathymetry	Alien Species
Targeted Products	3	5	2	18	10	3	2	2	7	4	5
1	1	2	3	1	1	1	3	2	1	2	4
2	1	2	2	2	3	3	3	2	1	2	4
3	1	3		2	3	2			1	2	4
4		1		5	3				1	4	4
5		1		5	4				1		4
6				5	5				1		
7				5	5				5		
8				5	5						
9				5	5						
10				1	5						
11				5							
12				5							
13				1							
14				2							
15				2							
16				2							
17				4							
18				3							

**Targeted Products average quality scores diagrams** 





# **Preliminary GAPS analysis**

# The Targeted products with lowest "fitness for purpose"

- 1. Challenge 4 (climate) products encounter the largest problem since of the temperature measurements at surface, 500 m and bottom depth over past 50 years and 100 years are non-uniform in time and space and do not permit to create the consistent maps of temperature trends over the Black Sea. The same problem was reported for the observations of the Black Sea ice coverage for the 50-year period (1966-2015) and the 100-year period (1916-2015).
- 2. Challenge 5 (coast) reported gaps on the sea level and sediment mass balance data for the past 10, 50 and 100 years periods.
- 3. Challenge 9 (river inputs) reported a lack of information on the eel and salmon biomass in the Black Sea Rivers.
- 4. Challenge 10 (bathymetry) reported gaps in the input data sets related to geographical coverage, as the data from the bathymetric surveys cover only 5% of the sea basin area.
- 5. Challenge 11 (alien species) produce low accuracy products since the data is non-uniform in time and space











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