



SEA BASIN CHECKPOINT LOT4: BLACK SEA

CHALLENGE 11 – Alien species Expert evaluation of Targeted Products

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Table of content

<i>Table of content</i>	3
Expert evaluation of Target Product quality	4
BLACKSEA_CH11_Product_1	4
BLACKSEA_CH11_Product_2	5
BLACKSEA_CH11_Product_3	6
BLACKSEA_CH11_Product_4	7
BLACKSEA_CH11_Product_5	7

Please use your own judgement to describe for each Targeted product of the assessment of the “fitness for purpose and use”. For each Targeted product please comment on the following points:

1. Assign an overall product quality score with respect to scope (fitness for purpose) and explain why, according to the scale in **Table 1**.
2. Identify the most important characteristic(s) for the Targeted Product quality (if all characteristics are important, please say so).
3. Identify which quality element(s) the most important characteristic(s) affects the Targeted Product quality.
4. Identify the limitations of the quality of the Targeted products due to the input data set used.
5. Explain which of the characteristics “most fails” to meet the scope of the Targeted Product.
6. Provide an expert judgement of the most important **gaps in the input data sets** for each Targeted Product.

SCORE	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

Table 1. Targeted Products quality scores and their meaning.

Expert evaluation of Target Product quality

BLACKSEA_CH11_Product_1

- 1) The quality score of the product is **sufficient (4)**. The developed table of *Mnemiopsis leidyi* alien species abundance and biomass includes 23 available datasets from the Black Sea Database created in framework of the NATO Sfp-971818 ODBMS Black Sea Project <http://sfp1.ims.metu.edu.tr/ODBMSDB/> and Bulgarian National Monitoring Programme <http://bgodc.io-bas.bg/documents/>. The data are submitted on Quality assurance (detection of stations with different names but the same geographic location; detection of stations with the same name but with different geographic locations). Afterward the values of stations with different names and the same geographic location are averaged; stations with the same name but in different geographic locations are renamed; the units are recalculated from ind/m³ and g/m³ to ind/m² and g/m² for more representative spatial surface performance). The data modification doesn't allow reliable assessing of the biological and ecological parameters of the *Mnemiopsis leidyi* population. Nevertheless the data are not evenly distributed in space and time the product is useful for visualization of the alien species distribution in the Black Sea.
- 2) The product includes two characteristics, abundance and biomass of the species, both of them are equally important for the Targeted Product quality.
- 3) The quality elements which affect the product quality are:

- **Horizontal Spatial Coverage and Horizontal Resolution.** The data are insufficient in the North part of the basin;
 - **Temporal Coverage and Temporal Resolution.** The data doesn't cover the whole period from the species settlement in 1982 till now. The databases would be more complete if they contain seasonal and annual data.
- 4) The limitations on the quality of the product due to the input dataset used (fitness for use) are:
- **Horizontal Spatial Coverage and Horizontal Resolution.** Each of used 23 UDs has different horizontal coverage and resolution which are not enough to present the species distribution on the entire Black sea.
 - **Temporal Coverage and Temporal Resolution.** The datasets cover relatively short time span related to monitoring campaigns.
- 5) There is not a separate dataset which "fails the most" to meet the scope of the Targeted Product (fitness for use). All of them are with limited space and time coverage.
- 6) The most important gaps in the input data sets are:
- Lack of long-term annual and seasonal data for the period from the species introduction till now.
 - Sparse and unevenly distributed sampling stations affect the reliability of the product.

The species population is a dynamic system with annual, seasonal and spatial variations. Our recommendations to the *Mnemiopsis leidyi* databases are in term of the completeness. The data should be in regular time intervals (seasonally) and with representative density of the stations net.

Other disadvantages are the unavailability and restrictions on the data created in the frameworks of some projects.

BLACKSEA_CH11_Product_2

- 1) The quality score of the product is **sufficient**. The digital map of *Mnemiopsis leidyi* alien species abundance distribution includes 21 available datasets (lack of abundance data of two datasets - "Vityaz", cruise 21; "Vityaz", cruise 26) from the Black Sea Database created in framework of the NATO Sfp-971818 ODBMS Black Sea Project <http://sfp1.ims.metu.edu.tr/ODBMSDB/> and Bulgarian National Monitoring Programme <http://bgodc.io-bas.bg/documents/>. The map with special resolution of 13.6 km is created base on Product 1 data. The product is useful for assessing the species distribution in the Black Sea but the data are not evenly distributed in space and time.
- 2) The product includes one characteristic, abundance of the *Mnemiopsis leidyi* alien species.
- 3) The quality elements which affects the product quality are:
- **Horizontal Spatial Coverage and Horizontal Resolution.** The data are insufficient in the North part of the basin;
 - **Temporal Coverage and Temporal Resolution.** The data doesn't cover the whole period from the species settlement in 1982 till now. The databases would be more complete if they contain seasonal and annual data.
- 4) The limitations on the quality of the product due to the input dataset used (fitness for use) are:

- **Horizontal Spatial Coverage and Horizontal Resolution.** Each of used 21 UD's has different horizontal coverage and resolution which are not enough to present the species distribution on the entire Black sea.
 - **Temporal Coverage and Temporal Resolution.** The datasets cover relatively short time span related to monitoring campaigns.
- 5) There is not a separate dataset which “fails the most” to meet the scope of the Targeted Product (fitness for use). All of them are with limited space and time coverage.
- 6) The most important gaps in the input data sets are:
- Lack of long-term annual and seasonal data for the period from the species introduction till now.
 - Sparse and unevenly distributed sampling stations affect the reliability of the product.
 - The data should be in regular time intervals (seasonally) and with representative density of the stations net.

BLACKSEA_CH11_Product_3

- 1) The quality score of the product is **sufficient** (4). The digital map of *Mnemiopsis leidyi* alien species biomass distribution includes 23 available datasets from the Black Sea Database created in framework of the NATO Sfp-971818 ODBMS Black Sea Project <http://sfp1.ims.metu.edu.tr/ODBMSDB/> and Bulgarian National Monitoring Programme <http://bgodc.io-bas.bg/documents/>. The map with special resolution of 13.6 km is created base on Product 1 data. The product is useful for assessing the species distribution in the Black Sea but the data are not evenly distributed in space and time.
- 2) The product includes one characteristic, biomass of the *Mnemiopsis leidyi* alien species.
- 3) The quality elements which affects the product quality are:
- **Horizontal Spatial Coverage and Horizontal Resolution.** The data are insufficient in the North part of the basin;
 - **Temporal Coverage and Temporal Resolution.** The data doesn't cover the whole period from the species settlement in 1982 till now. The databases would be more complete if they contain seasonal and annual data.
- 4) The limitations on the quality of the product due to the input dataset used (fitness for use) are:
- **Horizontal Spatial Coverage and Horizontal Resolution.** Each of used 23 UD's has different horizontal coverage and resolution which are not enough to present the species distribution on the entire Black sea.
 - **Temporal Coverage and Temporal Resolution.** The datasets cover relatively short time span related to monitoring campaigns.
- 5) There is not a separate dataset which “fails the most” to meet the scope of the Targeted Product (fitness for use). All of them are with limited space and time coverage.
- 6) The most important gaps in the input data sets are:
- Lack of long-term annual and seasonal data for the period from the species introduction till now.
 - Sparse and unevenly distributed sampling stations affect the reliability of the product.

The data should be in regular time intervals (seasonally) and with representative density of the stations net.

BLACKSEA_CH11_Product_4

- 1) The quality score of the product is **sufficient** (4). The table of *Beroe ovata* alien species abundance and biomass distribution includes 15 available datasets from the Bulgarian National Monitoring Programme <http://bgodc.io-bas.bg/documents/>. The data are submitted on Quality assurance. The units are recalculated from ind/m³ and g/m³ to ind/m² and g/m² and averaged for more representative spatial surface performance. The data are not evenly distributed in space and time. The product does not adequately meet the scope to assess the species distribution on the entire Black Sea but is a starting point.
- 2) The product includes two characteristics, abundance and biomass of the species.
- 3) The quality elements which affects the product quality are:
 - **Horizontal Spatial Coverage and Horizontal Resolution.** The data covers only the Western part of the sea basin;
 - **Temporal Coverage and Temporal Resolution.** The data doesn't cover the whole period from the species settlement in 1997 till now. The databases would be more complete if they contain seasonal and annual data.
- 4) The limitations on the quality of the product due to the input dataset used (fitness for use) are:
 - **Horizontal Spatial Coverage and Horizontal Resolution.** Each of used 15 UD's has different horizontal coverage and resolution which are not enough to present the species distribution on the entire Black sea.
 - **Temporal Coverage and Temporal Resolution.** The datasets cover relatively short time span related to monitoring campaigns.
- 5) There is not a separate dataset which "fails the most" to meet the scope of the Targeted Product (fitness for use). All of them are with limited space and time coverage.
- 6) The most important gaps in the input data sets are:
 - Lack of long-term annual and seasonal data for the period from the species introduction till now.
 - Sparse and unevenly distributed sampling stations affect the reliability of the product.

The species population is a dynamic system with annual, seasonal and spatial variations. Our recommendations to the *Beroe ovata* databases are in term of the completeness. The data should be in regular time intervals (seasonally) and with representative density of the stations net.

Other disadvantages are the unavailability and restrictions on the data created in the frameworks of some projects.

BLACKSEA_CH11_Product_5

- 1) The quality score of the product is **sufficient** (4). The table of *Mnemiopsis leidyi* alien species abundance and biomass includes 24 available datasets with the original values (g/m³; ind/m³) from the Black Sea Database created in framework of the NATO Sfp-971818 ODBMS Black Sea Project <http://sfp1.ims.metu.edu.tr/ODBMSDB/> and Bulgarian National Monitoring Programme <http://bgodc.io-bas.bg/documents/>. Being an invasive species but not only alien *Mnemiopsis* affects the ecosystem even with its presence in the environment.

The publications of Vinogradov *et al.*, 2005 and Shiganova *et al.*, 2014 took thresholds for Good Environmental Status (GES) $< 4\text{g/m}^3$ (120 g/m^2) and $<5\text{ ind/m}^3$ respectively. In concentration above these thresholds the species affects the ecosystem. The data modifications of Product 1 do not allow reliable assessment of this impact on the ecosystem.

- 2) The product includes two characteristics, abundance and biomass of the species, both of which are equally important for the Targeted Product quality.
- 3) The quality elements which affects the product quality are:
 - **Horizontal Spatial Coverage and Horizontal Resolution.** The data are insufficient in the North part of the basin;
 - **Temporal Coverage and Temporal Resolution.** The data doesn't cover the whole period from the species settlement in 1982 till now. The databases would be more complete if they contain seasonal and annual data.
- 4) The limitations on the quality of the product due to the input dataset used (fitness for use) are:
 - **Horizontal Spatial Coverage and Horizontal Resolution.** Each of used 24 UD's has different horizontal coverage and resolution which are not enough to present the species distribution on the entire Black sea.
 - **Temporal Coverage and Temporal Resolution.** The datasets cover relatively short time span related to monitoring campaigns.
- 5) There is not a separate dataset which "fails the most" to meet the scope of the Targeted Product (fitness for use). All of them are with limited space and time coverage.
- 6) The most important gaps in the input data sets are:
 - Lack of long-term annual and seasonal data for the period from the species introduction till now.
 - Sparse and unevenly distributed sampling stations affect the reliability of the product.
 - Proposal and testing of new indicators.