



European Commission
DG Environment

Technical Report of October 2012 Expedition in Rezovo Border Area



**MSFD Guiding Improvements in the Black Sea
Integrated Monitoring System**

Package activity number 4

The institution of MPAs, prospective for going beyond the art

Dissemination level - Public

Status Final

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Leader partner for this action: Institute of Oceanology - BAS, Varna



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I. Methodology of sampling

The method of *hydrobotanical* transects was applied for *macrophyte* sampling (Kalugina-Gutnik, 1975). Four sample sites were chosen. Two sample sites are processed for *zoobenthos* samples and 3 - for *macrophytobenthos*. Every transect was divided to layers according to depth up to 15 m. For example: for *macrophytes* - 0-1m; 1-3 m; 5 m; 10 m; 15 m. From every depth layer are sampled minimum 9 to 15 replicates with metal square frame with size 20 x 20 cm (Minicheva et al., 2003). Samples were taken with help of scuba diving technique. Coordinates of stations are presented in table 1 and map of the area of investigation is applied (fig. 1). Polygons (sites) were chosen as most characteristic for biological diversity and favourable status of communities and habitats in this area after visual census.

Zoobenthic samples were taken according to the manual (Todorova, Konsulova, 2005). At each sampling point (5,10,15 m) three replicates were collected using a 19 cm diameter cylinder corer (283.5 cm² base area) to a depth of 25 cm (Dalkin & Barnett, 2001) in one site in Rezovo (Rezovo1). Two quantitative samples were taken from 1m and 2 samples from 5m depth in Silistar. Few qualitative samples with *zoobenthic* inhabitants were taken in hard substrate in *Cystoseira* meadows.

The samples were washed with seawater through a 1 mm mesh-size sieve and fixed with 4% buffered formaldehyde.

Some fish species are described after visual census.

References:

Dalkin M. and B. Barnett, 2001. *Procedural Guideline No. 3-6. Quantitative sampling of intertidal sediment species using cores*. In: Davies J. (senior editor), Baxter J., Bradley M., Connor D., Khan J., Murray E., Sanderson W., Turnbull C. and Vincent M. (eds), *Marine Monitoring Handbook*, pp. 253-257. ISBN 1 86107 5243

Kalugina-Gutnik A. 1975. *Black Sea phytobenthos*. M. “Naukova dumka”, Kiev, 245p (in Russian).

Minicheva G.G., Zotov A.B., Kosenko M.N. *Methodical recommendations for determining the complex of morpho-functional parameters of unicellular and multicellular forms of aquatic vegetation // GEF Project for renewal of the Black Sea ecosystem*. – Odessa. 2003 – 32 p.

Todorova V., T. Konsulova 2005. *Manual for collection and treatment of soft bottom macrozoobenthos samples*. Black Sea Commission, Istanbul, 37 p.



Online: http://ps-blacksea.commission.ath.cx/downloads/Todorova%20Manual_zoobenthos.doc

II. Expedition: October 2012

Vessel: motor boat

Period: 16.10.2012 – 18.10.2012

Project: MISIS-MSFD Guiding improvements in the Black Sea integrated monitoring system

Region of sampling: Rezovo, Silistar, Achtopol

The following parameters were sampled:

- Hydrophysics: temperature, salinity, transparency.
- Hydrochemistry: dissolved oxygen, nutrients in water column.
- Hydrobiology: macrophytobenthos, zoobenthos

Used scientific equipment:

- Metallic square frames for macrophytobentos – 20 x 20 cm
- “Secchy” disc
- Box corer for zoobenthos sampling, 19 cm-diameter, 20 cm-height
- Scuba diving equipment
- Mercury thermometer 0,1° precision
- Under water photographic camera “Olympus”
- GPS “Garmin”

2.1 Coordinates of investigated stations

Station	Depth (m)	Coordinates
1a	0-3	N 42.111312° E 27.913050°
1b	5	N 42.112209° E 27.915947°
1c	10	N 42.113275° E 27.918856°
2a	1	N 42.023582° E 28.010341°
2b	5	N 42.023735° E 28.014632°
3a	0-3	N 42.015179° E 28.017932°
3b	5	N 42.015215° E 28.018089°



3c	10	N 42.015275° E 28.019725°
3d	15	N 42.015444° E 28.021877°
4a	0-3	N 42.005882° E 28.022357°
4b	5	N 42.006450° E 28.022050°
4c	10	N 42.006550° E 28.022766°
4d	15	N 42.005917° E 28.024933°

Table 1: Coordinates of investigated stations

2.2 Map of the investigated polygons

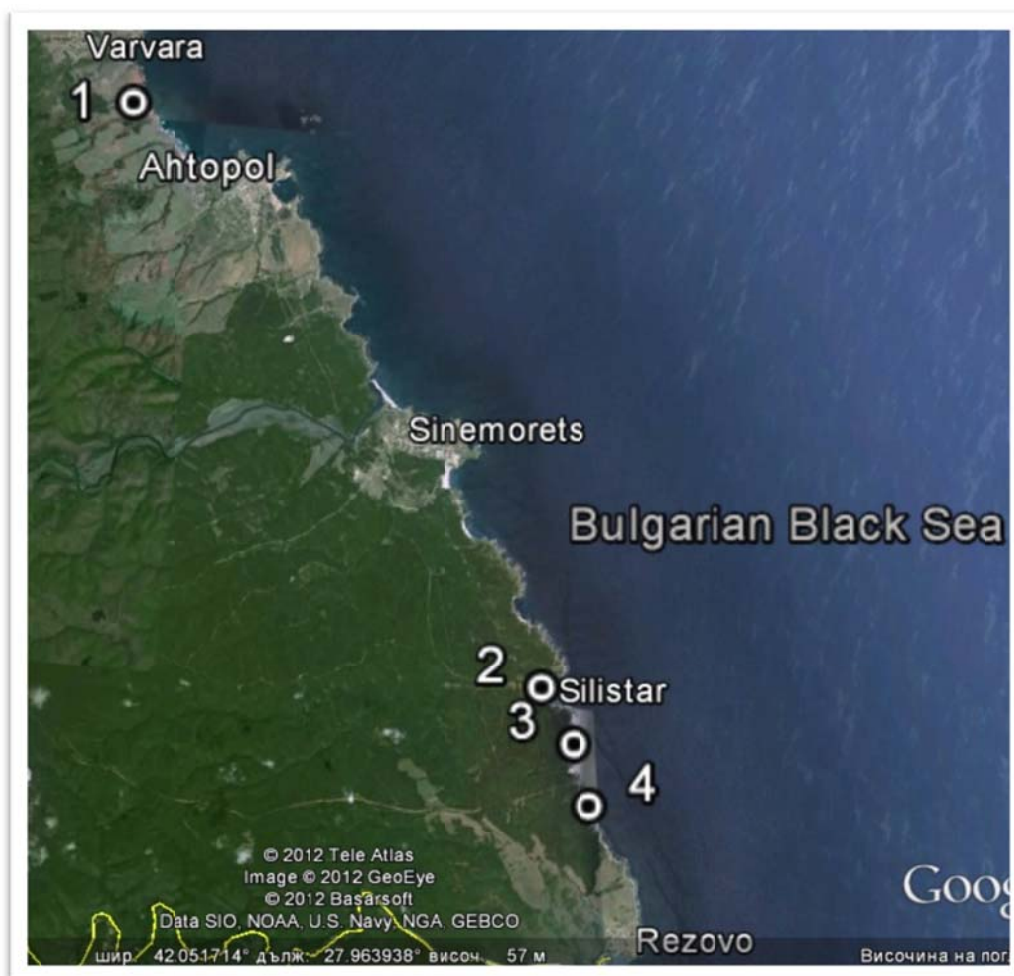


Fig. 1: Map of the investigated polygons

1. Near Achtopol; 2. Silistar; 3. Rezovo 1; 4. Rezovo 2



2.3 Sampling protocol

Object of investigation: *macrophytes, zoobenthos*

Aim of investigation: Carrying out of expedition – Rezovo area; project “MISIS” 7 RP, Project activity 4 - MPAs, partner Bulgaria-IO-BAS, Varna

Device of sampling: Metallic square frame with size – 20 x 20 cm for *macrophytobenthos* and cylinder box corer- 19 cm diameter and 25 cm height

Scientific leader of the expedition: Kristina Denchev

Date	Polygon	Latitude	Longitude	Time at start	Time at end	Depth (m)	Type of substrate	Number of sample	Activity
16.10.2012	1. Near Ahtopol	27.913050°	42.111312°	12.15 h	17 h	0-1; 1 - 3; 3-5; 10	stones, boulders, rocks	48	visual census, photos, video filming, <i>macrophytobenthos</i> sampling
17.10.2012	4. Rezovo 2	28.022357°	42.005882°	11.30 h	16.40 h	0-1; 1 - 3; 3 -5; 10; 15	Rocks, sand	57 - <i>macrophytes</i>	visual census, photos, video filming, <i>macrophytobenthos</i> sampling
17.10.2012	2. Silistar	28.010341°	42.023582°	16.40 h	17.15 h	1; 5	sand	4 <i>zoobenthos</i> samples, 1 water sample	<i>zoobenthos</i> sampling
18.10.2012	3. Rezovo1	28.017932°	42.015179°	11 h	17h	0-1; 1 - 3; 3 -5; 10; 15	Rocks, sand	57- <i>macrophytes</i> ; 9- <i>zoobenthos</i> , 1 water sample	visual census, photos, video filming, <i>macrophytobenthos</i> sampling, <i>zoobenthos</i> sampling

Table 2: Schedule of activities during survey