



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

Contribution to the revision of monitoring programmes in line with MSFD requirements



Contribution to the revision of monitoring programmes in line with MSFD requirements:

MISIS outputs

- Diagnostic Report
Position Paper: Black Sea Monitoring Compliance to Marine Strategy Framework Directive (MSFD)

→ - Overview of the marine environmental monitoring in Bulgaria, Romania and Turkey (Picture of ongoing activities)

- Harmonization of methods and practices at the sub-regional level (MISIS JS)

- SoE Report with common indicators and testing of new ones

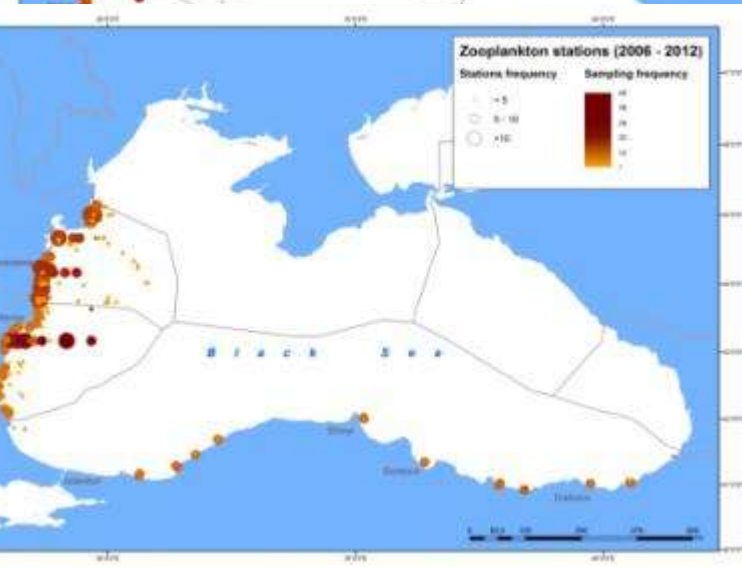
→ - A synthesis of national recommendations for programme revisions

- Key and specific bottlenecks/recommendations identified by all



+ DEVOTES SWOT analysis for Black Sea monitoring

MISIS outputs : Overview of the marine environmental monitoring in Bulgaria, Romania and Turkey



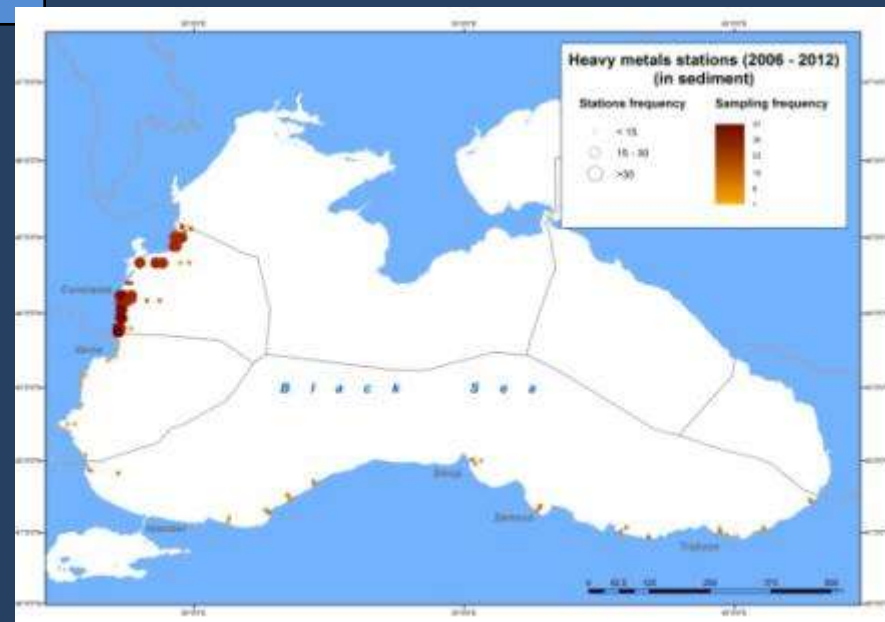
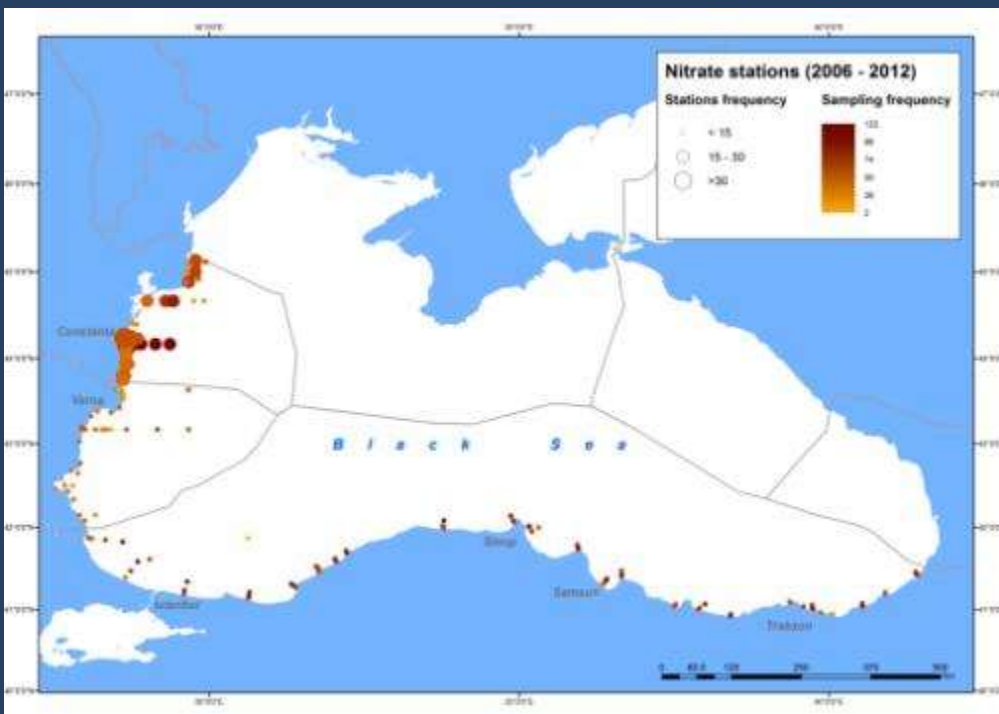
| Biological parameters | Bulgaria | Romania | Turkey |
|-----------------------|----------|---------|--------|
| Chlorophyll a | 30 | 57 | 81 |
| Phytoplankton | 30 | 57 | 31 |
| Zooplankton | 27 | 56 | 23 |
| Zoobenthos | 24 | 55 | 13 |
| Phytobenthos | 27 | 27 | ND |





MISIS outputs : Overview of the marine environmental monitoring in Bulgaria, Romania and Turkey

| Nutrients | Bulgaria (IO-BAS) | Romania (NIMRD) | Turkey (IU-IMSM) |
|------------|-------------------|-----------------|------------------|
| N (NH4) | 30 | 61 | |
| N (NO3) | 30 | 61 | 81 |
| N (NO2) | 30 | 61 | 81 |
| P (PO4) | 30 | 61 | 81 |
| SiO4 | 30 | 61 | 81 |
| TN | 19 | 16 | |
| TP | 21 | 60 | 81 |
| TOC [mg/L] | 19 | 35 | 81 |





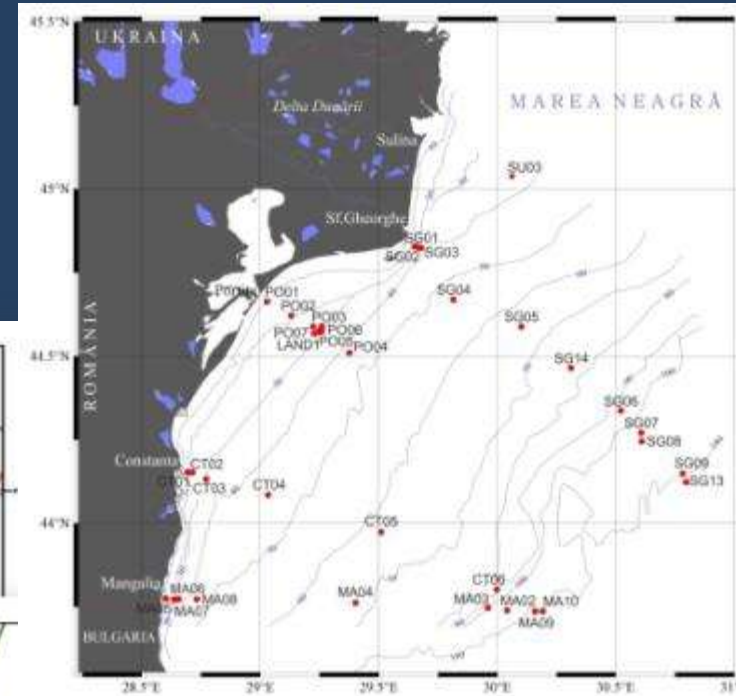
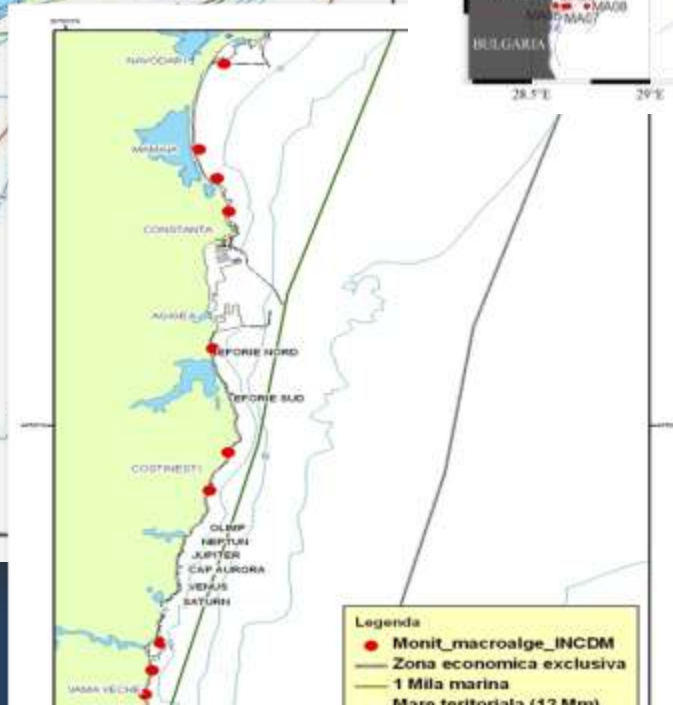
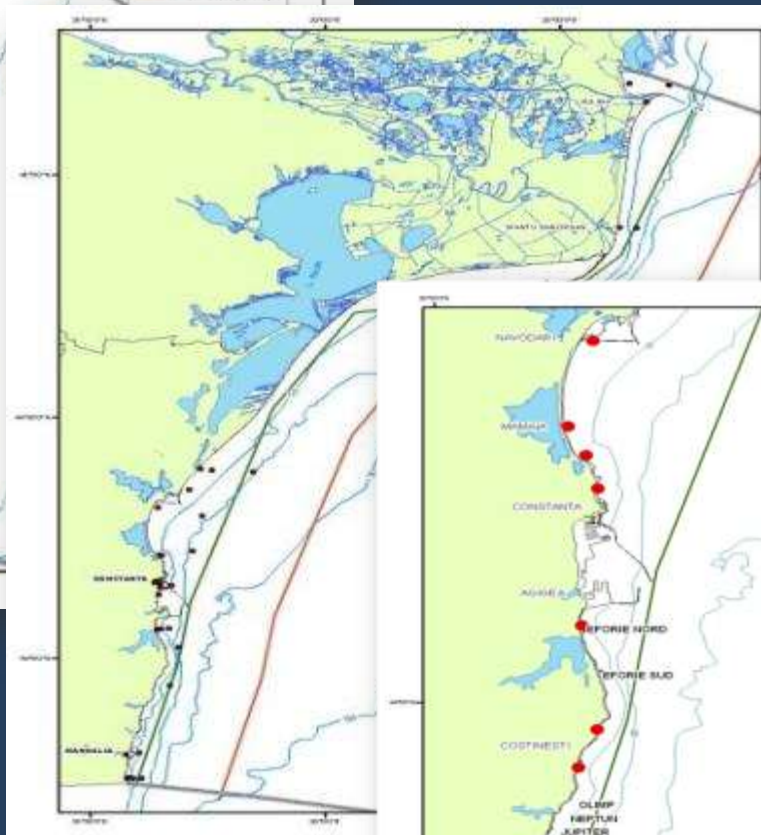
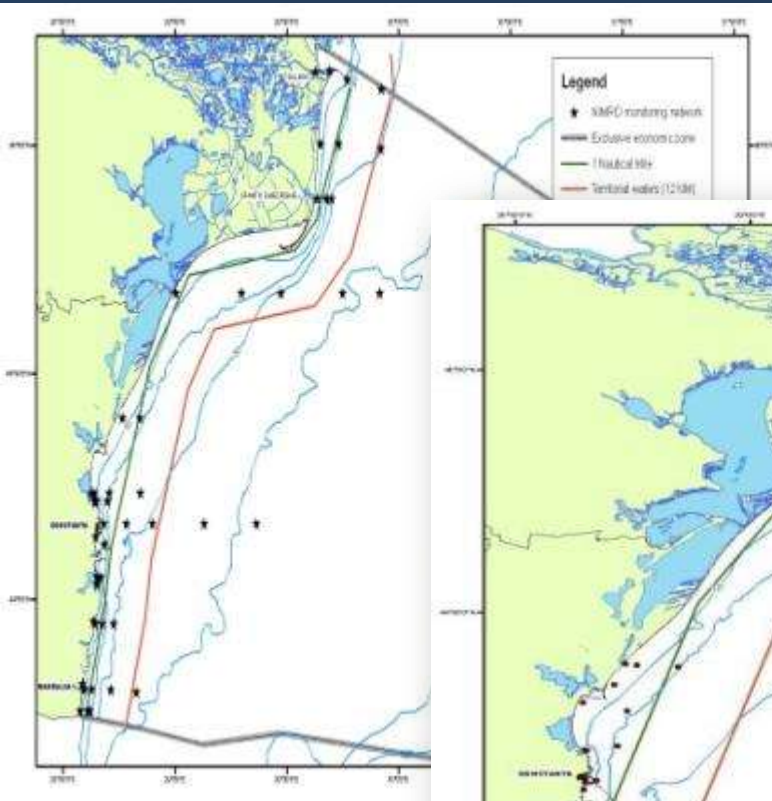
An analysis of national level recommendations for the revision of ongoing monitoring activities

- * Fact sheets produced for ongoing activities and recommendations for revision by Romania and Bulgaria (ARCADIS)*
- * National Project, DeKoS, outputs for Turkey*

| |
|---------------------------------|
| Monitoring sub-programme |
| Water column habitats |
| Seabirds |
| Mammals and reptiles |
| Sea bottom habitats |
| Commercial fish |
| Eutrophication |
| Contaminants |
| Hydrography |
| Marine litter |
| Noise |



National level recommendations for the revision of ongoing monitoring activities - Romania



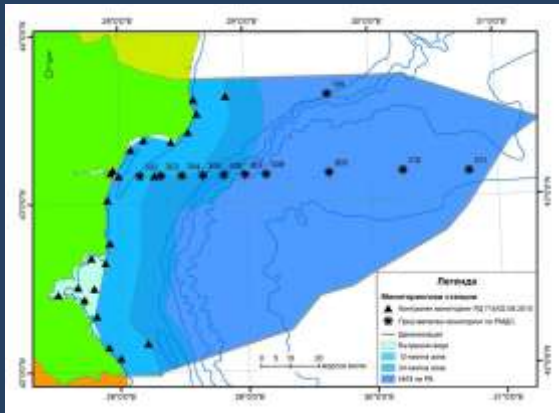


National level recommendations for the revision of ongoing monitoring activities - **Romania**

| Monitoring sub-programme | Related GES descriptor | Indicators | Parameters | Ongoing monitoring network- spatial (2012-2013) | Ongoing monitoring network-temporal | Recommendations for revision |
|--------------------------|------------------------|------------|---|--|---|--|
| Water column habitats | D1, (D2), D4 | | Physical/chemical parameters, Chl, Phytoplankton, Zooplankton, Microbiological parameters | 45 sts at coastal including 5 transects from coast to open Additional 35 sts at the coast | 4 times/yr Bi-weekly (Phyto, microb) 2 times/yr | <ul style="list-style-type: none"> - Integration of monitoring activities required by different policy - coordination and better use of capacities of different organizations - Increase temporal resolution - Extension of spatial coverage (to include open water habitats) - Increase the number of species groups and habitat types monitored for less studied ones - indicators for microbial loop - new mon. tools for open sea |



National level recommendations for the revision of ongoing monitoring activities - Bulgaria



| Monitoring sub-programme | Related GES descriptor | Indicators | Parameters | Ongoing monitoring network- spatial (2012-2013) | | Ongoing monitoring network-temporal | Recommendations for revision |
|--------------------------|------------------------|------------|--|---|-----------------------|-------------------------------------|--|
| Water column habitats | D1, (D2), D4 | | Physical/chemical parameters, Chl, Phytoplankton Zooplankton | Coastal | 20sts/13 WB | 6 times/yr | <ul style="list-style-type: none"> - The spatial resolution and temporal density of samplings are not determined based on statistically robust methods. To be modified. - Determination of the pressure gradient should be addressed by adding additional station from the point sources of pollution (river mouths and marine waters) in the offshore direction |
| | | | | Territorial | 3tsts | 4 times/yr | |
| | | | | EEZ | 10sts/Galata transect | Research | |



National level recommendations for the revision of ongoing monitoring activities - Turkey



| Monitoring sub-programme | Related GES descriptor | Indicators | Parameters | Ongoing monitoring network-spatial (2012-2013) | Ongoing monitoring network-temporal | Recommendations for revision |
|--------------------------|------------------------|------------|--|---|-------------------------------------|---|
| Water column habitats | D1, (D2), D4 | | Physical/chemical parameters, Chl, Phytoplankton | 70 sts from coast to open within 5 nm especially from the river mouths to offshore (30 coastal, 40 marine stst) | 2 times/yr | <ul style="list-style-type: none"> - Collect winter-spring data - Increase temporal resolution at least to seasonal samplings - Extension of spatial coverage (to include open water habitats) - Increase the number of species groups and habitat types monitored for less studied ones - new mon. tools for open sea |



Contribution to the revision of monitoring programmes in line with MSFD requirements

Specific Recommendations to improve the monitoring components wrt MSFD, *DRII*

| Descriptor | Additional monitoring requirements |
|---|---|
| Descriptor 1, 4 and 6 – functional groups | Protozoa, ichthyoplankton, meiobenthos, microzooplankton, ... |
| Descriptor 1, 4 and 6 – functional groups | Marine mammals: 5 yearly census of dolphins populations Birds: seabirds colonies and seabird by-catch |
| Descriptor 1, 4 and 6 - habitats | Deep sea biogenic structures Seabed, mapping of habitats, tracing of habitat change and loss, hot spots of habitat destruction/degradation |
| Descriptor 2 - NIS | Abundance and distribution of NIS, especially in high risk locations |
| Descriptor 3 - fish | More species, target sps |
| Descriptor 4 – food web | Energy flows through the food web/production |
| Descriptor 5 - eutrophication | Primary production (phytoplankton and macroalgae), areas of hypoxia, change in macroalgal communities |
| Descriptor 7 – hydrographical conditions | Changes in water temperature and salinity related to human activities |
| Descriptor 8 - contaminants | Screening for new pollutants |
| Descriptor 9 – contaminants in seafood | Commercial fish |
| Descriptor 10 – marine litter | Floating and seafloor litter (macro and micro) |
| Descriptor 11 – underwater noise | Underwater noise level |



Contribution to the revision of monitoring programmes in line with MSFD requirements

KEY RECOMMENDATIONS .. 1,2

COVERAGE Expansion

- Higher resolutions in time and space : re- Scaling of monitoring, critical especially for water column habitats
- Continuity of monitoring with subsequent years : winter–spring period data collection
- Monitoring at a pressure gradient
- Monitoring open water habitats
- Increase areal coverage at sea bottom monitoring (habitats, litter,..)

TECHNIQUES Traditional +

- Use of new / advanced / innovative methods
- Operational monitoring
- Remote sensing and calibration
- New generation identification methods – barcoding of organisms



Contribution to the revision of monitoring programmes in line with MSFD requirements

KEY RECOMMENDATIONS...3, 4, 5

INSTITUTIONAL SET UP

- Higher level integration of monitoring activities (Environment, fisheries, transport administrations) at the national level
- Coordination by the responsible organization
- Development of necessary policy / regulatory tools

BUDGETS +++

- Increase funding
- Feasibility – Conduct cost / benefit analysis
-

OPTIMIZATION

- Risk–based monitoring
- Integration of descriptors while preparing monitoring plans (e.g. D3/D9/D10,...)
- Never duplicate (cruises, infrastructure, databases,...)
- Coordination – cooperation of competent institutes
-



Contribution to the revision of monitoring programmes in line with MSFD requirements

KEY RECOMMENDATIONS...6, 7

NETWORKING

- Sustain what is already achieved in the projects
- Connect different operational monitoring facilities , multi-purpose use of buoys,....
- Share experiences among institutions
- Facilitate human capacity building also in different institutions
-

REGIONAL COOPERATION

- Use of high level adoption tools of Black Sea Commission
- Support of EU
- Joint Programming of countries
- Joint surveys for open waters and share of infrastructure
-

R/V TUBITAK MARMARA 2013-

23/06-05/07 2014

Sinop area coastal-open sea



Regional class, 42m
International waters,
accessible

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THANK YOU FOR YOUR ATTENTION

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