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WP2 - Black Sea pressures and impacts assessment - field work analysis - Results, Deliverables, Recommendations

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Final Meeting - ANEMONE Project

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- 1. Contribution so far - coordination/partnership, reports results, deliverables, cruises, conferences, other**
- 2. Status of Deliverables**
- 3. Conclusions and recommendation from each of the deliverables**
- 4. Problems encountered/to address**
- 5. Discussion**





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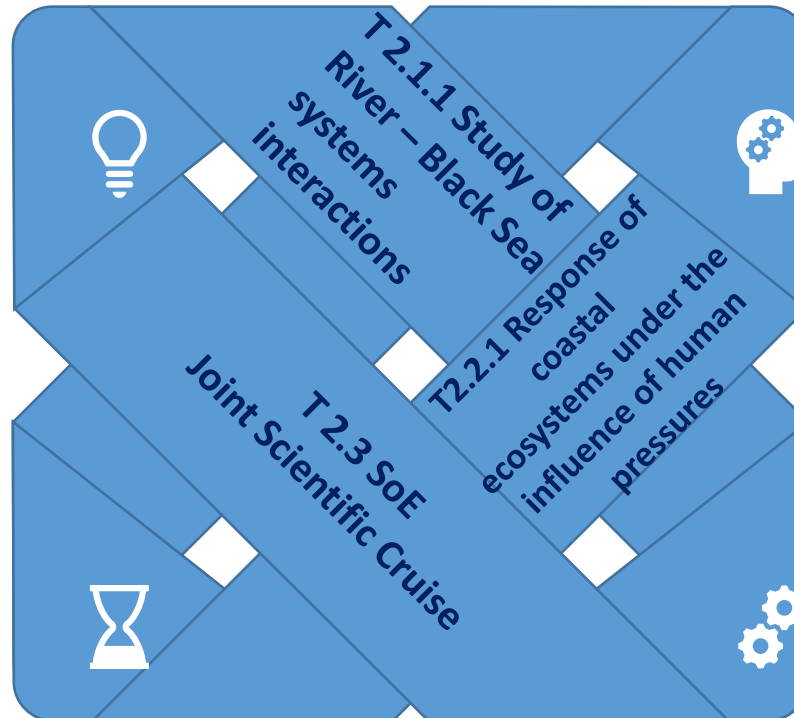
1. **Contribution so far - coordination/partnership, reports results, deliverables, cruises, conferences, other**

Deliverables

WP-T2 Field work: conducting pilot monitoring studies in selected study area

Comparative assessment of rivers impact on the Black Sea water quality through pilot case studies carried out in marine areas in front of rivers mouths

Collection of quality controlled and comparable data sets for the Black Sea environmental status assessment



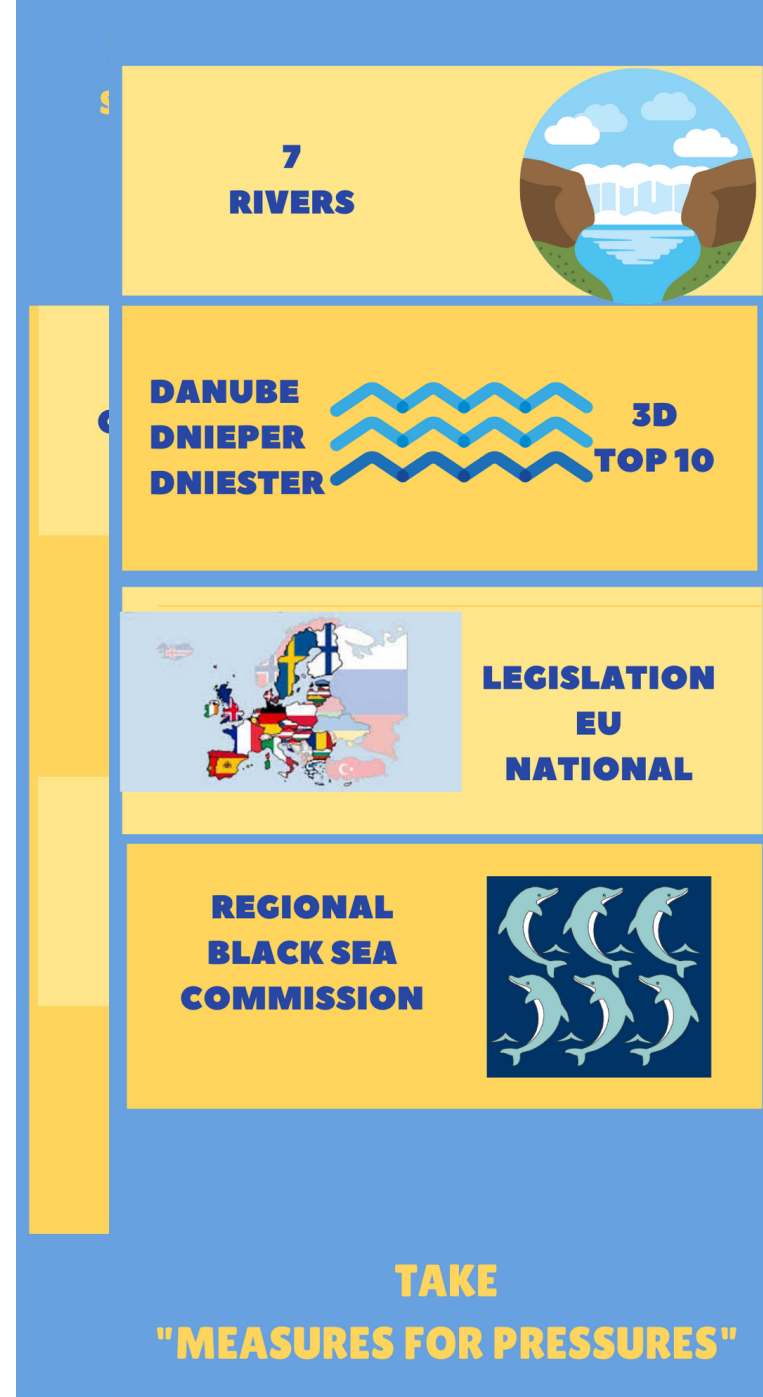
Coastal sources impact on the Black Sea ecosystem

Testing and harmonization of the Black Sea Monitoring and Assessment Guideline (BSMAG)(T1)

Provide new environmental monitoring data and information needed for the assessments of the Black Sea state of environment, including pressures and impacts, focusing on filling the knowledge gaps identified at national and regional level.

T 2.1.1 Study of River – Black Sea systems interactions

Impact of the rivers loads on the Black Sea
ecosystem



Chapters (please check everything)

1. Rivers catchment and features description – Dnieper, Southern Bug, Dniester, Danube (UA and RO), Kamchia, Sakaria and Yesilirmak – emphasizing the activities and pressures
2. Structure, functions, and processes of marine ecosystems with relevance for rivers-sea interaction assessment - cruises ANEMONE results
 - Pelagic habitats – Phytoplankton, Zooplankton, Jellyfish, Water column chemistry – physico-general, nutrients and contaminants.
 - Benthic habitats – Zoobenthos, Chemical characteristics of sediments
3. Pressures linked to rivers discharge – Anthropogenic pressures on the marine environment (Annex III, Table 2a – Substances, litter and energy – input of nutrients, organic matter and other substances (synthetic and non- synthetic)) – integrated tools – E-TRIX, BEAST and CHASE



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4. **Black Sea ecosystem response to river influences – in progress**
5. **Conclusions and recommendations**
6. **References**
7. **Annexes**
 - Network stations and cruises**
 - Methods**
 - List of species**
 - Descriptive statistics**

198 figures, 26 tables, 234pp



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Title: Impact of the rivers loads on the Black Sea ecosystem

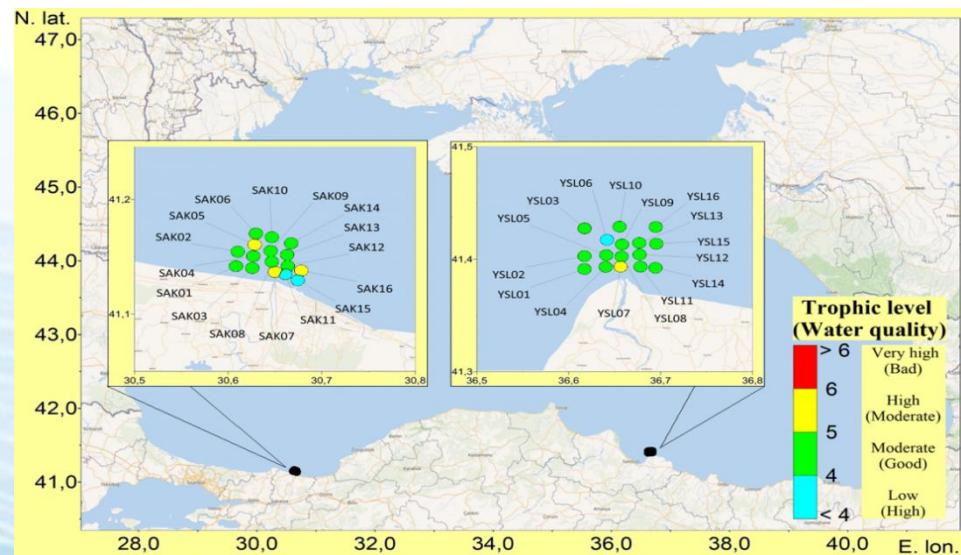
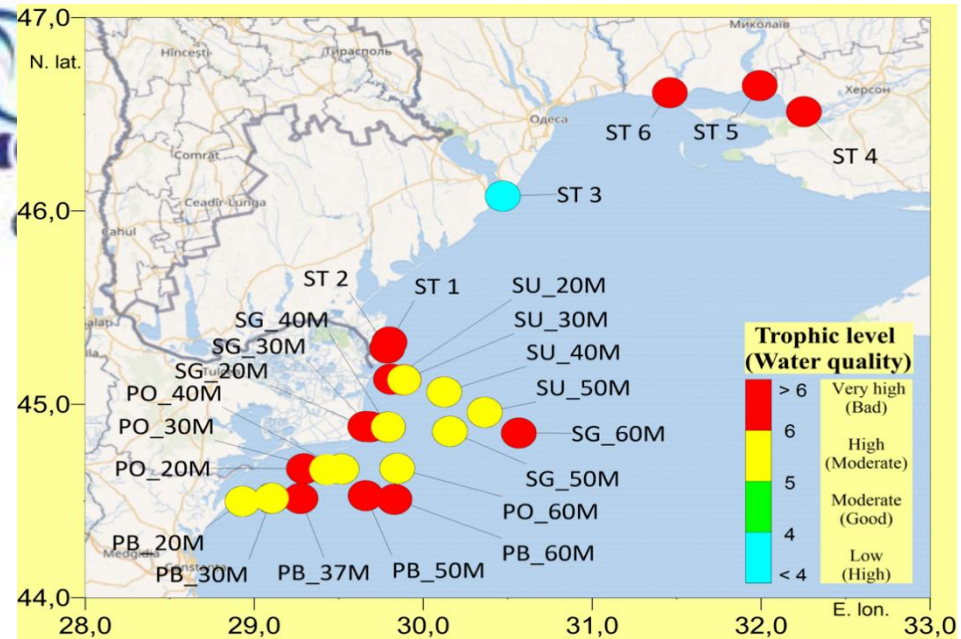
Contributions:

Content	UKR-SES	NIMRD	IO-BAS	TUBITAK
Rivers catchment and features description	✓	✓	✓	✓
Marine ecosystems Pelagic habitats – FPK, ZPK	✓	✓	✓	✓
Water column chemistry – general and nutrients	✓	✓	✓	✓
Contaminants in water	✓	✓	na	✓
Marine ecosystems benthic habitats	✓	✓	✓	✓
Contaminants in sediments	✓	✓	na	✓



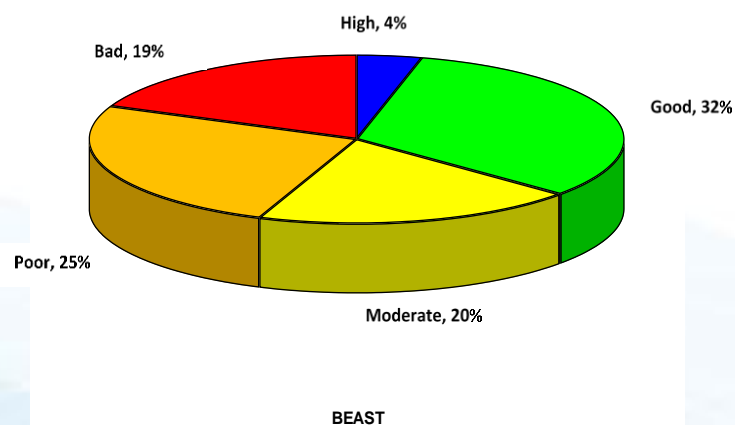
Integrated assessment – Pressures linked to rivers discharge INPUT OF NUTRIENTS

- **TRIX** - In general, the Black Sea shelf waters quality matched GES for both surface and near-bottom waters. The exception is two stations in the Ukrainian part of the shelf, where the water quality was lower than GES. In the central area of NPMS, the surface water quality was not GES.



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- BEAST**



Eutrophication is still a major problem in the Northern rivers. Meanwhile, we identified as Potential Problem Areas the North Western and Southern Black Sea.

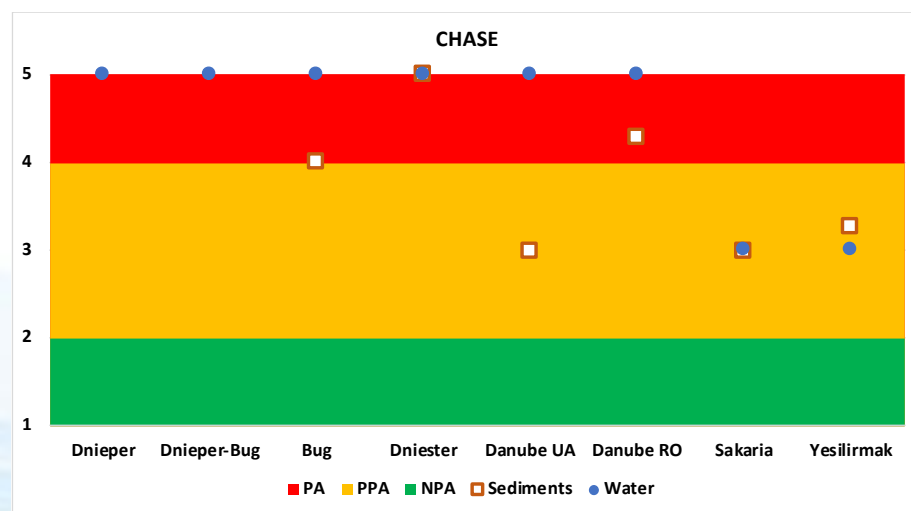
It is true that their drainage basins are extremely large (both as surface and population) in comparison with the Western rivers.

Therefore, in this context, the effort of nutrients enrichment reduction is crucial for the ecosystem 's health.

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INPUT OF CONTAMINANTS - CHASE

- Even though there are many differences between areas regarding indicator substances or threshold values used in assessment, the Black Sea environmental quality is better in the southern part where the status was generally *moderate*, comparative with the other areas which were in *bad* status.
- A common agreed set of indicators and threshold will give a better understanding of the pressures from the contaminants input into the Black Sea.





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Conclusions and Recommendations

- In ANEMONE we performed (one of the) first assessments of the pressures and impacts simultaneously for 7 rivers from N, NW, W, and S Black Sea.
- We observed significant differences between areas not always attributable to the rivers' size. Thus, the negative effect of Danube river on coastal marine environment (according to the phytoplankton indicators) was significantly lower compared with Dnieper, Bug, and Dniester rivers.
- The effect of Kamchia river input on the ecological status of coastal Black Sea ecosystem is better expressed in causes of eutrophication – nutrients and direct effects - phytoplankton.
- The nutrients and contaminants enrichment led to moderate-poor-bad status in most of the areas.
- Tools - TRIX (?), BEAST and CHASE - governance performance indicators - evaluating the success of policies developed to effectively manage coastal and marine environment.
- In our study, the Danube's Mouths are classified as potential problem areas which represents an encouraging case for the Black Sea waters quality improvement.
- Implementing the Danube basin's program of measures (ICPDR) (e.g. TNMN, phosphate detergents ban), which led to the improvement of the Black Sea waters quality in other rivers catchments.





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Conclusions and Recommendations

- **ICPDR - To improve the water quality, an ambitious programme of measures for the whole Danube River Basin District has been agreed under the EU WFD. To assess trends in water quality, the ICPDR oversees the TransNational Monitoring Network (TNMN). The network carefully monitors physical, chemical and biological conditions in the Danube and its tributaries, and provides in TNMN Yearbooks an annual overview of pollution levels as well as long term trends for water quality in the basin.**



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- **Generally, we didn't use data from River Basins management Plans. In ANEMONE we do not have information about their degree of harmonization.**
- **The potential sources/pressures must be subject of measures, for example**
 - **In agglomerations below 2000 p.e. where collection systems are in place, appropriate treatment needs to be ensured in case of discharge to fresh-water and estuaries.**
 - **All agglomerations \geq 2000 p.e. have to have collection systems in place, or use individual or appropriate systems provided they achieve the same level of environmental protection and have to respect emission limits for biochemical oxygen demand (BOD5) and chemical oxygen demand (COD).**
 - **Agglomerations above 10000 p.e. in sensitive areas also have to respect emission limits for TN and/or TP, except if a minimum reduction rate of TN and TP is achieved in the sensitive area as a whole.**
 - **Countries have to monitor surface and ground waters and to designate nitrate-vulnerable zones. In order to reduce water pollution caused by nitrates countries must adopt action programmes compulsory in nitrate-vulnerable zones. Moreover, countries have to establish a code of good agricultural practice to be applied on the whole territory on a voluntary basis.**





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- **Industrial emissions limit values included in the permits of industrial installations are to be based on the application of best available techniques, which are the most effective techniques to achieve a high level of environmental protection.**
- **Other types of measures:**
 - **Zoning of critical areas (e.g. draining to poorly flushed embayment) for environmental protection**
 - **Water sensitive urban design in new and re-developments**
 - **Riparian and foreshore rehabilitation and protection (e.g. buffer areas)**
 - **Improved effluent management (e.g. sewage treatment plants, dairy effluent etc.)**
 - **Stormwater control devices**
 - **Monitoring and evaluation of condition indicators**
- **Data achieved in the deliverable are also an important sources for ICZM and MSP for Land Sea Interaction (LSI) quantification.**



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- **An adaptive approach to managing estuary ecosystem health and community values is recommended.**
- **Monitoring, evaluation and reporting is the key to adaptive management - we didn't consider the pressures monitoring – effluents loads/concentrations.**
- **Whilst the scale and nature of a monitoring program will reflect local circumstance, a well designed condition monitoring program will provide information on an estuary ecosystem's health and trend (is it getting better or worse?) that can be used in ongoing implementation, evaluation and reporting.**
- **An ecosystem health monitoring program can also support or link to other programs, provide an additional source of information for the community, and integrate with other processes, programs and monitoring (such as land use planning and catchment-based programs).**



T 2.2.1 Response of coastal ecosystems under the influence of human pressures

HOT SPOTS impact on the Black Sea coastal waters

174

100%

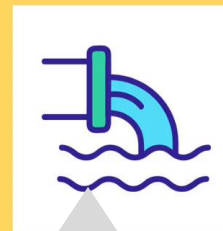
112

64%

T2
FIELD WORK: CONDUCTING
PILOT MONITORING
STUDIES IN SELECTED STUDY
AREA
RIVER-SEA INTERACTION

HOT SPOTS

3
COUNTRIES



4 WWTPS



Chemical
Parameters

Common parameters

MORE THAN
5000
CHEMISTRY
ANALYSIS



ACT FOR THE BLACK SEA
HEALTH

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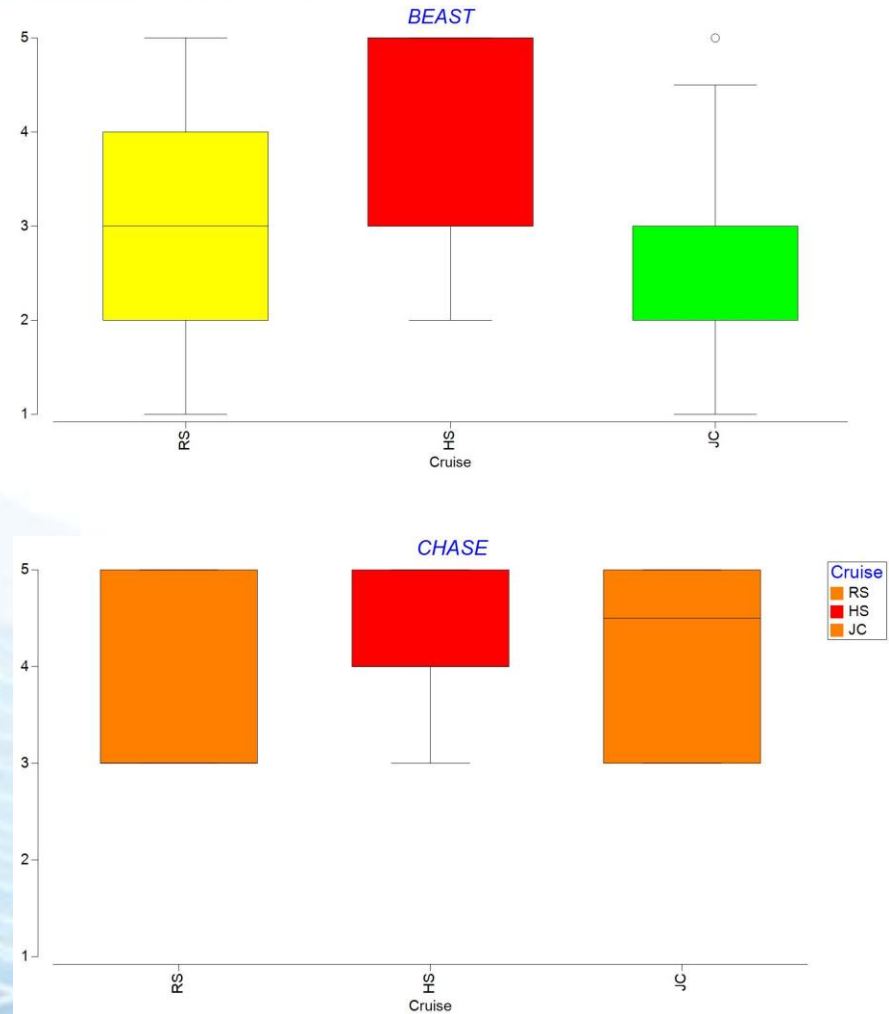
Chapters (please check everything)

1. Short description of the Hot Spots – emphasizing the activities and pressures
2. Pelagic habitats – Phytoplankton, Zooplankton, Water column chemistry – physico-general, nutrients and contaminants
3. Benthic habitats – Zoobenthos, Chemical characteristics of sediments
4. Pressures linked to coastal sources of pollution– Anthropogenic pressures on the marine environment (Annex III, Table 2a – Substances, litter and energy – input of nutrients, organic matter and other substances (synthetic and non-synthetic)) – integrated tools – E-TRIX, BEAST and CHASE
5. Conclusions and recommendations
6. References
7. Annexes
 - Network stations and cruises
 - Methods
 - List of species
 - Descriptive statistics

122 figures 23 tables 153 pp

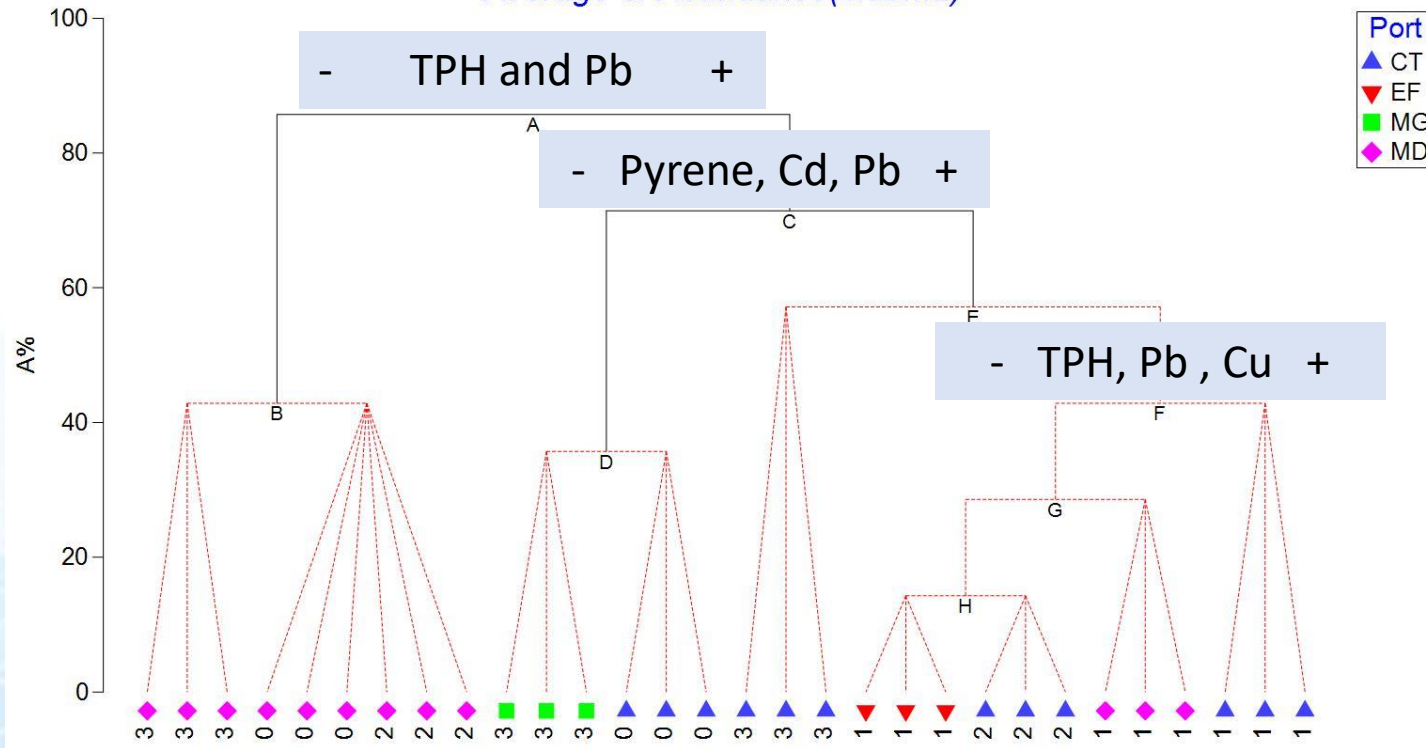
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- The results showed an amplified pressure (eutrophication and contaminants) from point sources (HS) – WWTPs and Ports.
- Polychaetes showed high diversity and density (RO Ports), usually over 80% of the total benthos abundance.
- Inside the ports, the polychaetes dominated the density with 100%. *Capitella capitata*, species found in almost all stations, is considered in many studies the most common species acting as an indicator of high organic matter (Dean, 2008).



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Average of Abundance(ind./m2)



- Monitor the activity, identify the pressure and take measures.

T2.2.2 Guideline on the adaptive criteria for monitoring of the maritime activities impact

The Guideline on the adaptive criteria for monitoring of the maritime activities impact deals with the required scope of the monitoring activities, the parameters that are to be analysed, the methods that should be used, and templates for reports.

A comprehensive GIS based tool for informed decision-making in the Black Sea region, covering specific areas (substrate, habitat, Natura 2000, etc.) and carried out or potential activities, will be developed.

1. Dredging and Dredged material management for sustainable ports and harbours
2. Oil and gas activities impact monitoring
3. Bottom trawling impact monitoring

T 2.3 Joint Scientific Cruise

State of the Environment

**T2
FIELD WORK: CONDUCTING
PILOT MONITORING
STUDIES IN SELECTED STUDY
AREA
RIVER-SEA INTERACTION**

SOE

**D1.
BIODIVERSITY**



**D5
EUTROPHICATION**

**D8&D9
CONTAMINANTS**



**D10
MARINE LITTER**

**ACT FOR THE BLACK SEA
HEALTH**



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Chapters (please check everything)

1. BIODIVERSITY

Introduction, Features and MRU, Criteria

Pelagic habitats

- Phytoplankton, Microzooplankton, Mesozooplankton – species composition and biodiversity, community structure and distribution, Dominant species, indicator ecological based assessment
- Macrozooplankton community structure
- Ichtyoplankton species composition and biodiversity, community structure

Benthic habitats

- Introduction, assessment area, indicators, results, recommendations.

Marine mammals – introduction, abundance overview, monitoring efforts,

2. EUTROPHICATION

Introduction, Material and methods-criteria, pressures, status

D5C1 – nutrients in water column

D5C2 – Chlorophyll a in water column

D5C3 – Harmful algal blooms – Noctiluca scintillans – qualitative – in progress

D5C4 – Water transparency



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Chapters (please check everything)

D5C5 – Bottom dissolved oxygen

D5C8 – Macrozoobenthos communities – in progress

Integrated assessment – BEAST

Gaps and recommendations

Conclusion

3. Contaminants and contamination of fish and seafood

Introduction, material and methods,

Heavy metals

TPH and PAHs

Organochlorine pesticides (OCPs)

Polychlorinated biphenyls (PCBs)

Integrated assessment – CHASE

Conclusion

4. Marine Litter

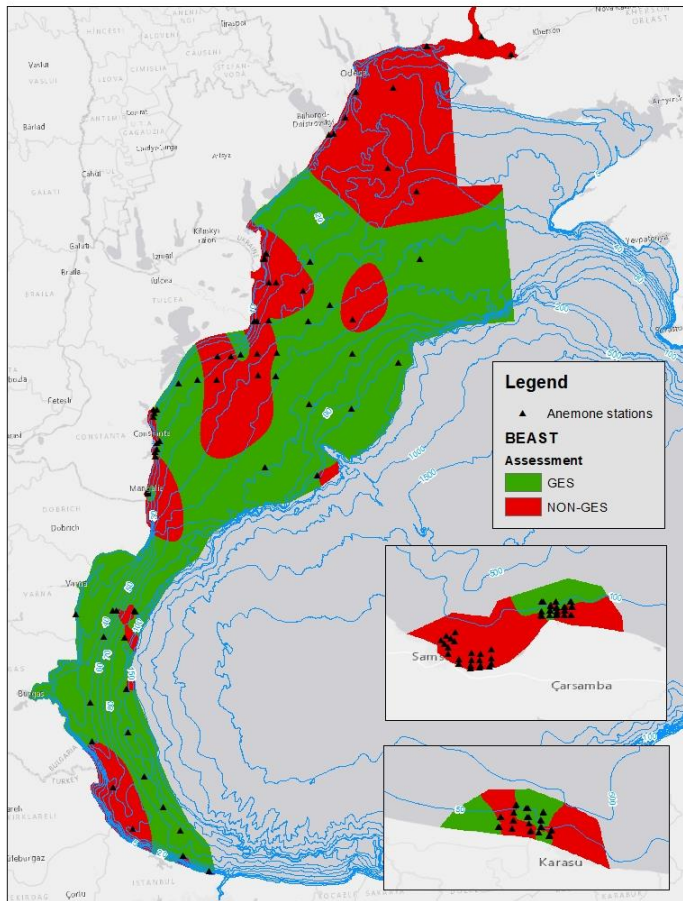
Overview - Beach litter, Floating litter, Sea floor litter, Microplastics

MSFD assessment – Floating and Bottom Litter

References, annexes

Overall, the efforts on eutrophication reduction are consistent with the results whilst for contamination we need more cooperation and work for decline it.

BEAST



Think of:

- Establish/Check ref. values/thresholds at the regional level based on their relationship with biological data.
- Need for regional “performance” indicators for pressures and measures.
- Access to the data repository for the Black Sea scientists.
- Send the “right” message to stakeholders.
- Links to the “Black Sea economy”.
- Innovation? Squeeze more our knowledge.
- More...to get the bigger picture



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2. Status of Deliverables

Status of deliverables

NOT SO GREAT!




GREAT!

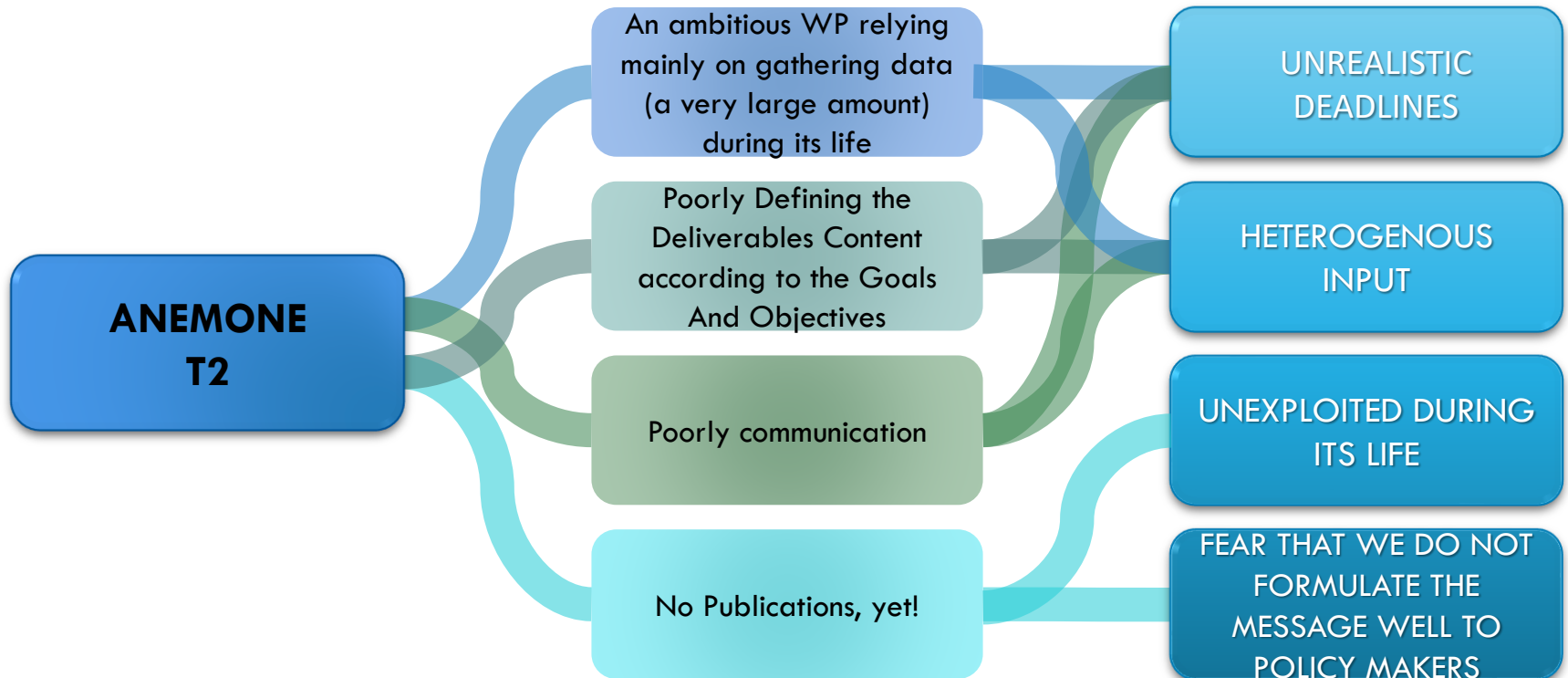


 T2.1.1. – River-Sea - RS

 T2.2.1 – Coastal sources - HS

 T2.3– SoE - JC

4. Problems encountered/to address



5. DISCUSSION & THANK YOU!

Sometimes called the 'flowers of the sea', sea anemones are actually beautiful animals, closely related to jellyfish and corals. All of the animals within this group have stinging cells which they use for the capture of prey and to protect themselves against predators*.

In the same way ANEMONE captured us for many days and (sleepless) nights.

Most anemones can reproduce asexually through budding, where fragments break off and develop into new individuals*.

In the same way ANEMONE opens new ways of teamwork and partnership.

