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Common borders. Common solutions.



# Use of BEAST - Romania

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# BEAST – Black Sea Eutrophication Assessment Tool

## principle

Based on HEAT (HELCOM Eutrophication assessment Tool) common approach of WFD and MSFD

WFD  
approach  
“OOAO”  
principle -  
columns

- Reference conditions (Ref.Con.)(column 1)
- Definition of an acceptable deviation (Ac.Dev.) from reference conditions (column 2) and target values (column 3)
- Calculation of an Ecological Quality Ratio (EQR) between zero and 1.00, where 1.00 represents undisturbed conditions and zero an acceptable ecological status and represents impaired conditions and an unacceptable ecological status
- Correct use of the “one out, all out” principle.
- Result – status: Bad, Poor, Moderate, Good, High

MSFD  
approach  
(based on  
OSPAR  
methodology)  
- rows

The assessment is based on three categories of parameters (rows) grouped in (corresponding also to criteria of Descriptor 5):

I. Degree of nutrient enrichment – phosphate (DIP), NO<sub>2</sub>, NO<sub>3</sub>, NH<sub>4</sub> (DIN)

II. Direct effects of nutrient enrichment – Chlorophyll *a*

III. Indirect effects of nutrient enrichment – Transparency

# Black Sea Eutrophication Assessment Tool, BEAST "OOAO" approach

Labels pointing to spreadsheet elements:

- Ref. values
- Acceptable deviation
- Target values
- u.m.
- Status – measured value
- Status – measured value
- Weight – importance(%)
- Partial result

Criteria	Indicator	RefCon	AcDev	EUT_Target	Unit	Resp	EUT_T_score	EUT_status	EUT_S_score	EUT_Ratio	Ind_Conf	Weight	C1_EUT_sum	C1_EUT_stat	C1_conf	C1_Weight
C1: Nutrient levels	DIN	112.00	50%	168.00	µg/L	+	H M L	49.98	H M L	0.298	50%	100%	0.504	GOOD	100%	100%
	DIP	4.65	50%	6.98	µg/L	+	H M L	4.96	H M L	0.711	50%	100%	0.504	GOOD	100%	100%
C2: Direct effects	Chl a	2.05	50%	3.08	µg/L	+	H M L	0.64	H M L	0.208	50%	100%	0.133	HIGH	100%	100%
	Tdensity	600000.00	50%	900000.00	cells/L	+	H M L	51340.00	H M L	0.057	50%	100%	0.133	HIGH	100%	100%
C3: Indirect effects	DO	80.00	25%	60.00	%	+	H M L	136.40	H M L	0.440	50%	100%	0.133	HIGH	100%	100%
	Secchi, m	9.00	25%	6.75	m	+	H M L	136.40	H M L	0.440	50%	100%	0.133	HIGH	100%	100%

Final eutrophication status: **GOOD**

Final confidence rating: **GOOD**

Annotations on the right:

- Nutrients levels – DIP and TNOx
- Direct effects – Chl a
- Indirect effects – Dissolved oxygen
- Result

Example of Each station sheet - description

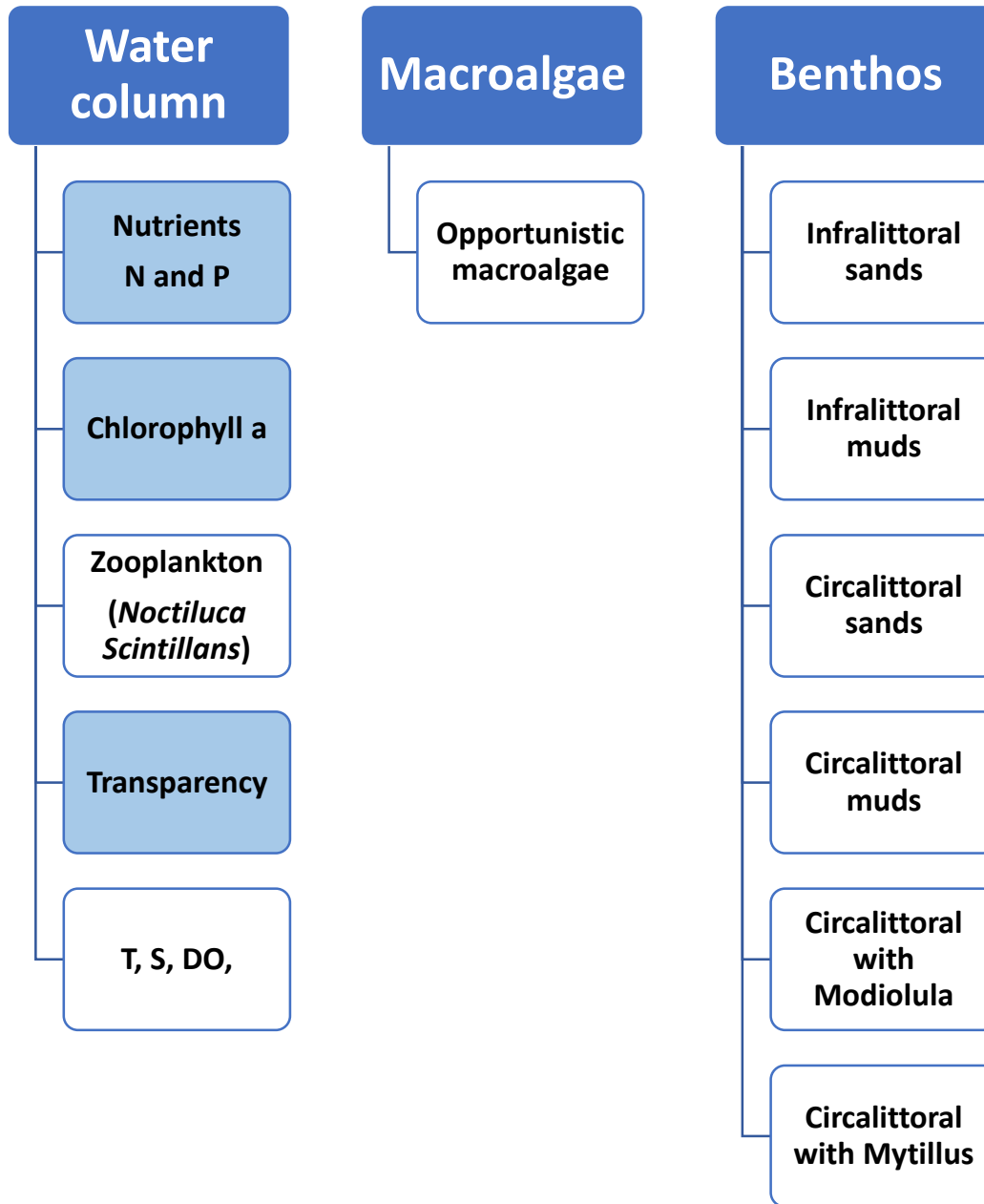
# The Assessment



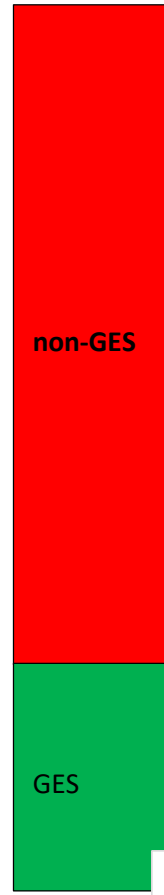
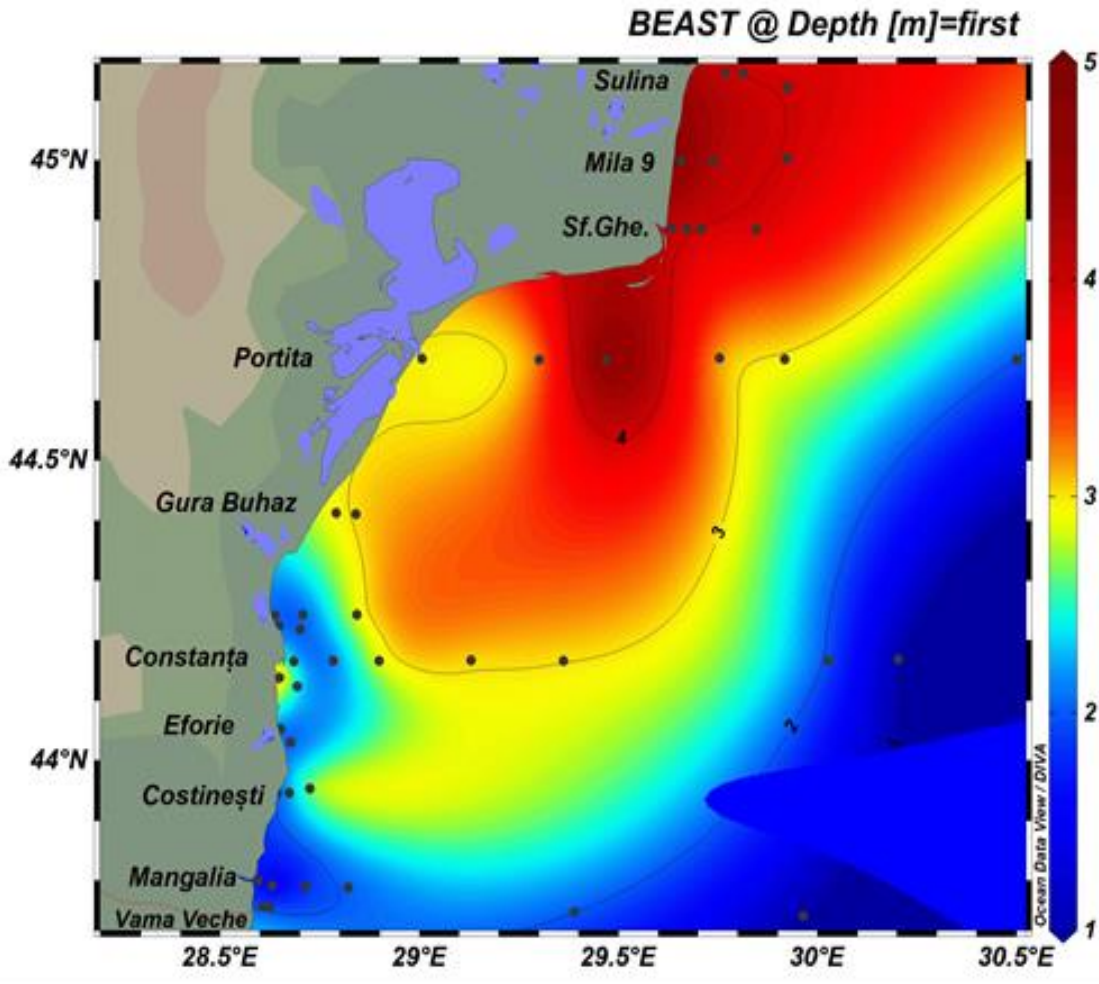
<i>Assigned value</i>	<b>BEAST</b>
1	High
2	Good
3	Moderate
4	Poor
5	Bad



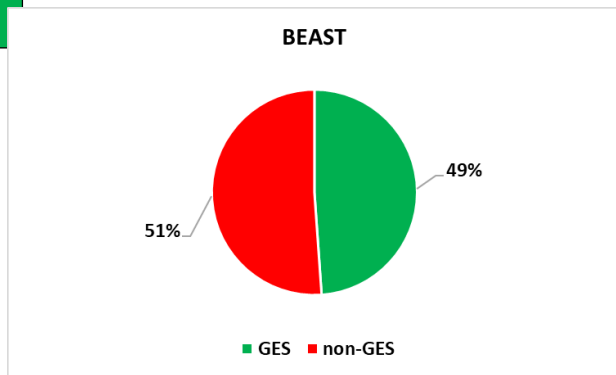
Parameters included in the national marine monitoring programme, D5



# Romanian Black Sea's status of eutrophication – 2012-2017



Variable salinity waters  
 - 0% (surface) GES  
 Coastal waters – 10,5%  
 (surface) GES  
 Marine waters –  
 38,4%(surface) GES



## Romanian Black Sea's status of eutrophication – 2012-2017

- Although the effects of nutrient enrichment of Romanian Black Sea waters have diminished over years of intense eutrophication, the analysis of shore pressures has identified the risk of non-good environmental status for D5 Eutrophication from the perspective of coastal and coastal nutrient intake.
- Subsequently, the analysis of parameters, indicators and criteria representing causes, direct and indirect effects of nutrient enrichment showed that good ecological status was not achieved in any of the water bodies - with variable salinity, coastal and marine.
- Although water quality improvements are observed for some parameters (e.g. phosphorus), in the Romanian Black Sea waters, nutrient concentrations are still high and produce effects especially during the warm season.
- The coupled effect of climate change and the anthropogenic impact of point but mostly diffuse sources can impact on the increase in nutrient concentrations due to hydrological changes in river flows but also to stratification of water masses and wind and currents, thus intensifying eutrophication.
- Therefore, it is very important to reduce nutrient concentrations by about 34% (P, northern), 13% (P, southern), 86% (N, northern) and 62% (N, southern).