

# Development of the monitoring programmes according with Water Framework Directive and Marine Strategy Framework Directive

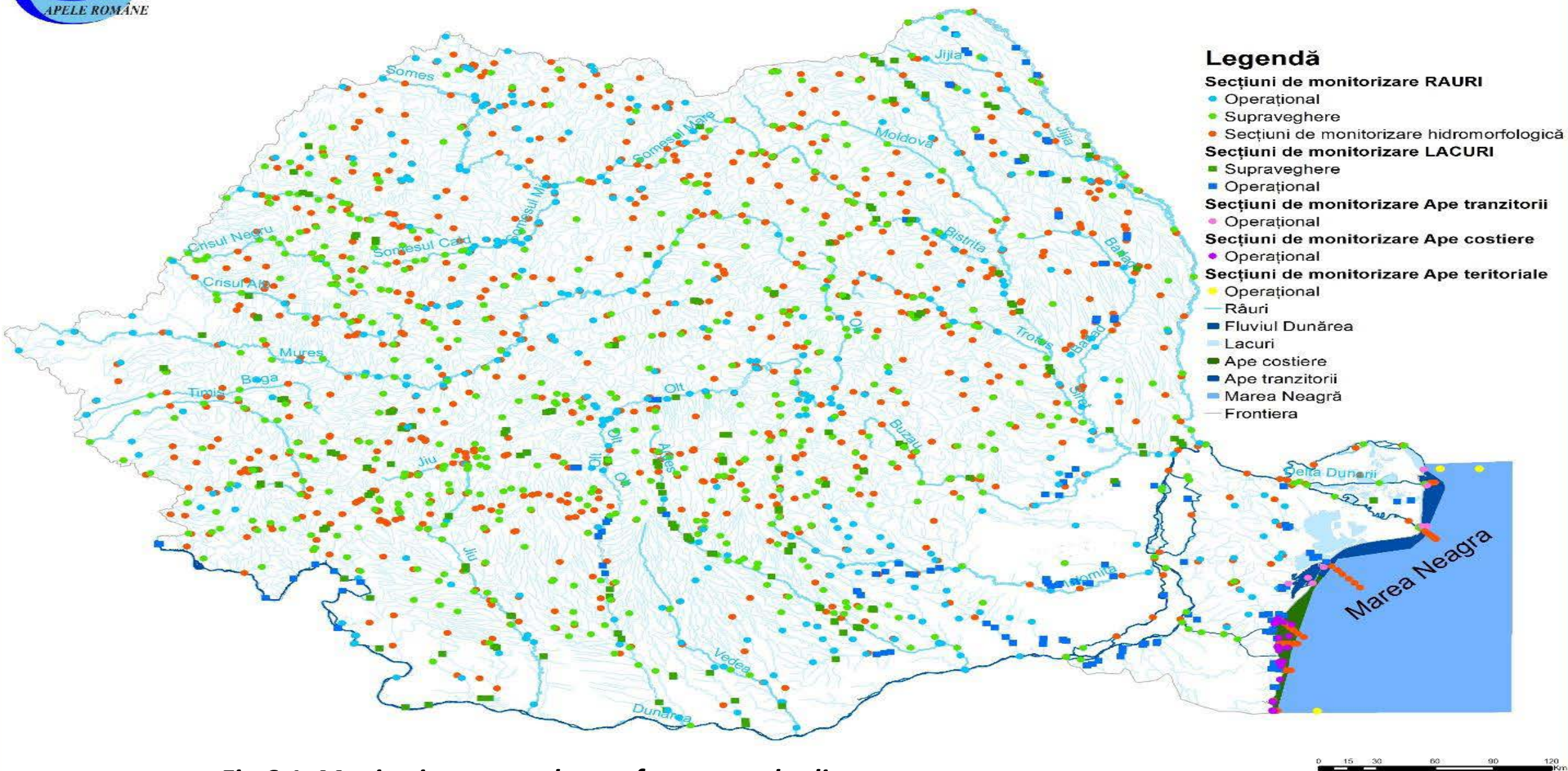
Gheorghe Constantin  
Director

Ministry of Environment, Water and Forests

ECRAN Regional Training, Istanbul, 18-20 May 2015

# Surface waters – water bodies and monitoring sections

WB/sectiuni	Rivers	Natural lakes	Reservoirs	Transitional Waters	Coastal waters	Total
WB	3497	53	165	6	3	3724
WB at risk	453	21	165	6	3	648
WB possible at risk	357	14	0	0	0	371
Surveillance	1517	102	381	18	40	2057
Out of which: fizico-chemical and biological	847	102	361	18	40	1367
Sectiuni operational	642	78	232	18	40	1009
Out of which: fizico-chemical and biological	397	78	212	18	40	744



**Fig 6.1. Monitoring network – surface water bodies**

## Groundwaters – water bodies and stretch

- **129 – WB (GWB)**
- **20 – GWB at risk**
- **7 – GWB possible at risk**

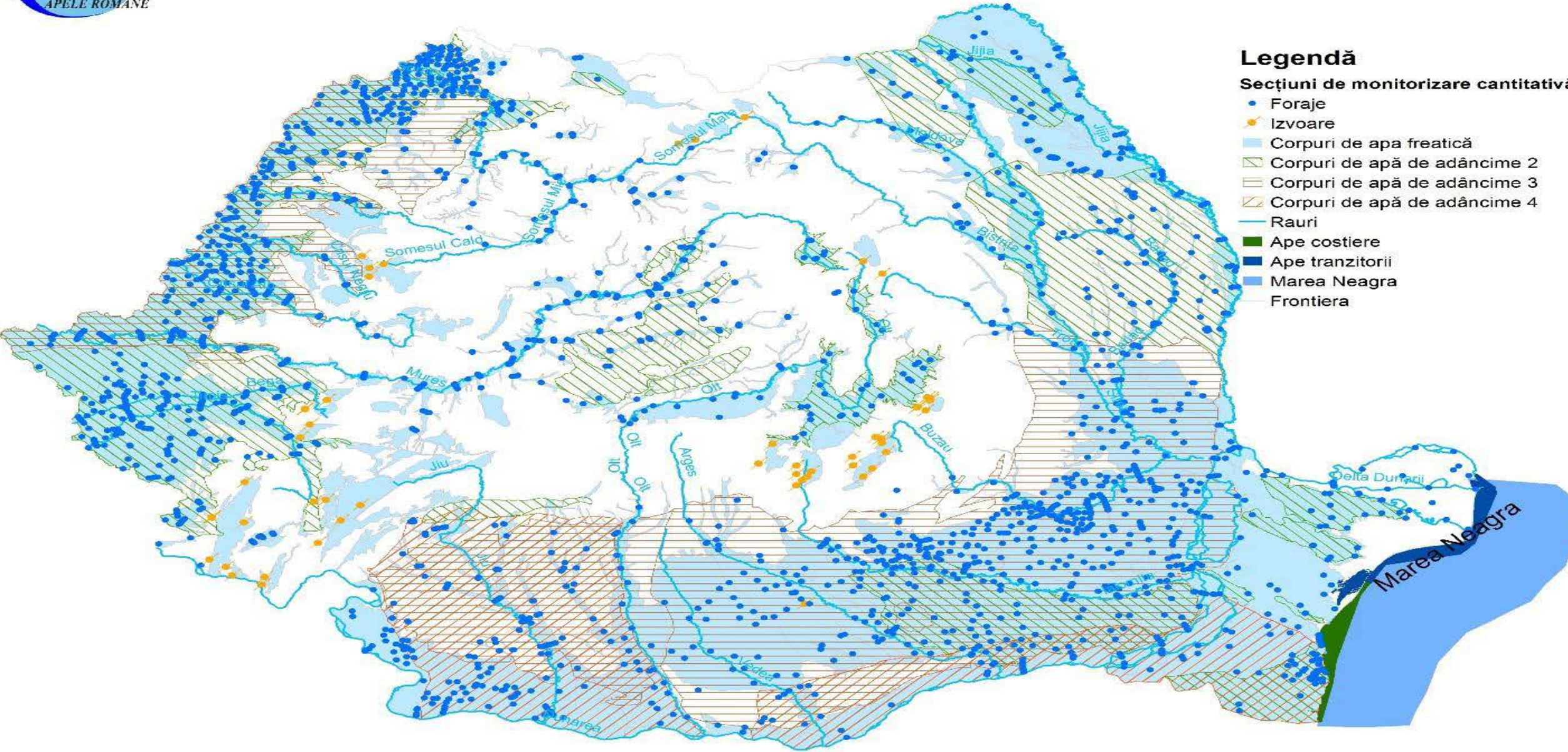
Monitoring sites	Drills	Springs	Total
Program quantitative	3166	116	3282
Chemical Programme Surveillance	2035	80	2115
Chemical Program Operational	1274	49	1323



## Legendă

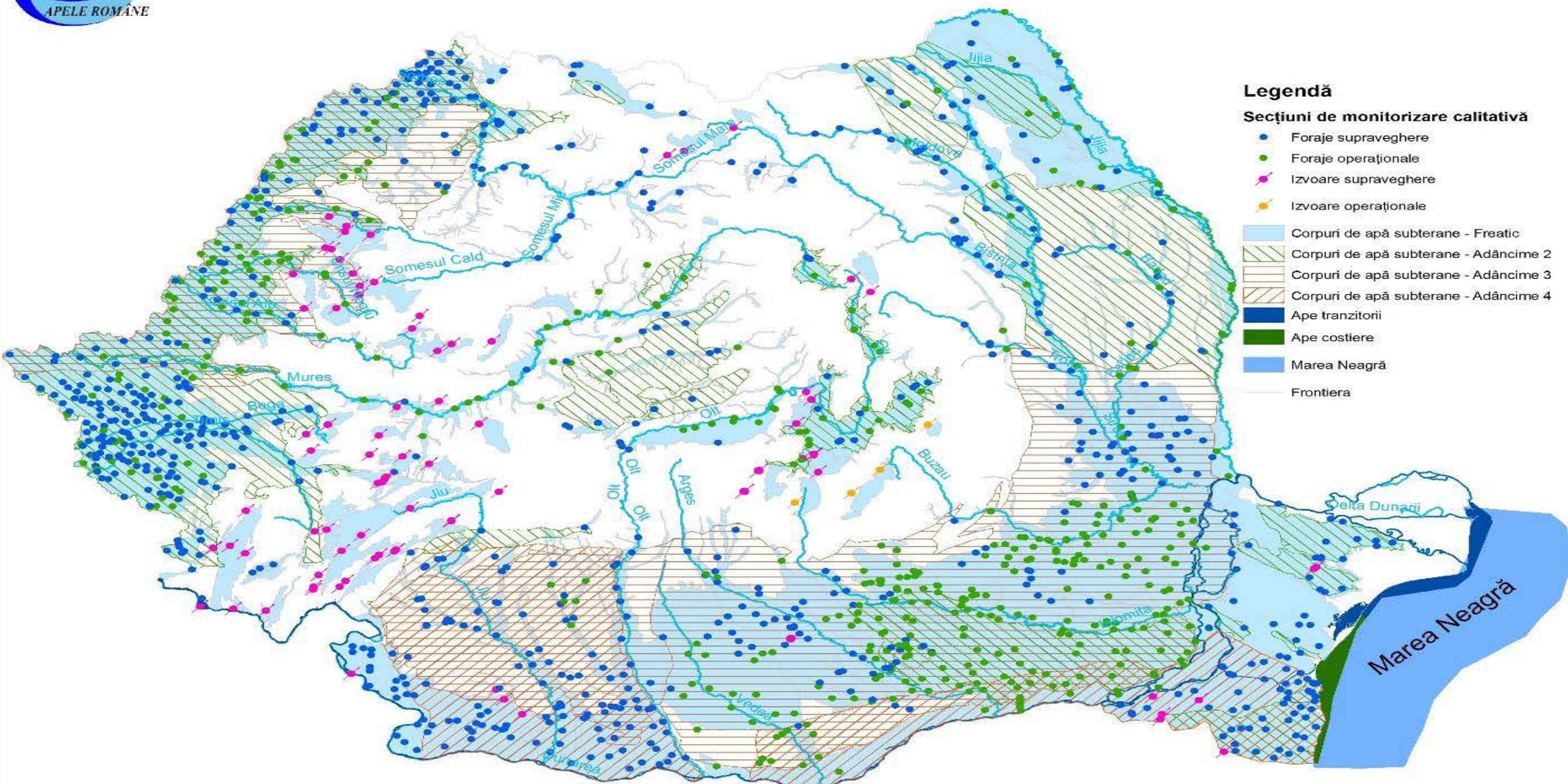
### Secțiuni de monitorizare cantitativă

- Foraje
- ★ Izvoare
- Corpuri de apă freatică
- Corpuri de apă de adâncime 2
- Corpuri de apă de adâncime 3
- Corpuri de apă de adâncime 4
- Rauri
- Ape costiere
- Ape tranzitorii
- Marea Neagră
- Frontiera



**Fig 6.2.1 Quantitative Monitoring network – groundwater bodies**





**Fig 6.2.2. Qualitative Monitoring network – groundwater bodies**

***Tabel 6.1. Elements, parameters and frequency of monitoring – surveillance programme - rivers***

QualityElements		Parameters	Frequency	
biological elements	Phytoplankton	Composition of taxa (list and nr. of species) density (expl/l)	2/year	3/year
	Microfitobentos	Composition of taxa (list and nr. of species) density (expl/m <sup>2</sup> )	2/year	3/year
	Macrofites	Composition of taxa (list and nr. of species) density (expl/m <sup>2</sup> )	1/3 years	1/3 years
	Zoobentos	Composition of taxa (list and nr. Of species) density (expl/m <sup>2</sup> )	2/year	3/year
	Fish fauna	Composition of taxa (list and nr. of species) density (exp/100 m <sup>2</sup> ) structure on age	1/3 years	1/3 years
Hydro morfological elements	Hydrological regime	Level and flow	H = 2 / day * Q = 20-60 /year*	H = 2 / day * Q = 20-60/year*
		Connectivity with GWB	1/3 days	1/3 days
		River continuity	1/6 years	1/6 years
	Morphological parameters	Depth variation and river width	1/year	1/year
		Structure and river bed substrate	1/6 years	1/6 years
		Structure of riparian area	1/6 years	1/6 years

*Elements, parameters and frequency of monitoring – surveillance programme – coastal waters*

Quality Elements		Parameters	Frequency	
	Transparency	Suspended matters, Turbidity, Colour	4/year	8/12/year**
	Temperature conditions	Temperature	4/year	8/12/year**
	Oxygen condition	Oxygen dizolvat COD – Cr, BOD <sub>5</sub> și în unele cazuri COT și COD	4/an	8/12/an**
	Salinity	Conductivitate/reziduu fix	4/an	8/12/an**
	Starea acidifierii	pH Alcalinity	4/an	8/12/an**
	Nutrients	Azotiți, Azotați, Amoniu Ntotal, Ortofosfați Ptotal Clorofila „a”	4/an	8/12/an**
	Nutrients (suspended matters)	N <sub>total</sub> , P <sub>total</sub>	4/year	8/ year
	Priority substances – water	1)	12/year	12/year
	Priority substances (suspended matters)	Heavy metals: Cd, Ni, Pb, Hg	4/year	8/year
	Priority substances (sediments)	2)	1/year	1/year
	Specific pollutants	3)	4/year	8/year
	Other pollutants	4)	4/year	8/year



**Tabel 6. 2 Elements, parameters and frequency of monitoring – surveillance and operational programmes - lakes**

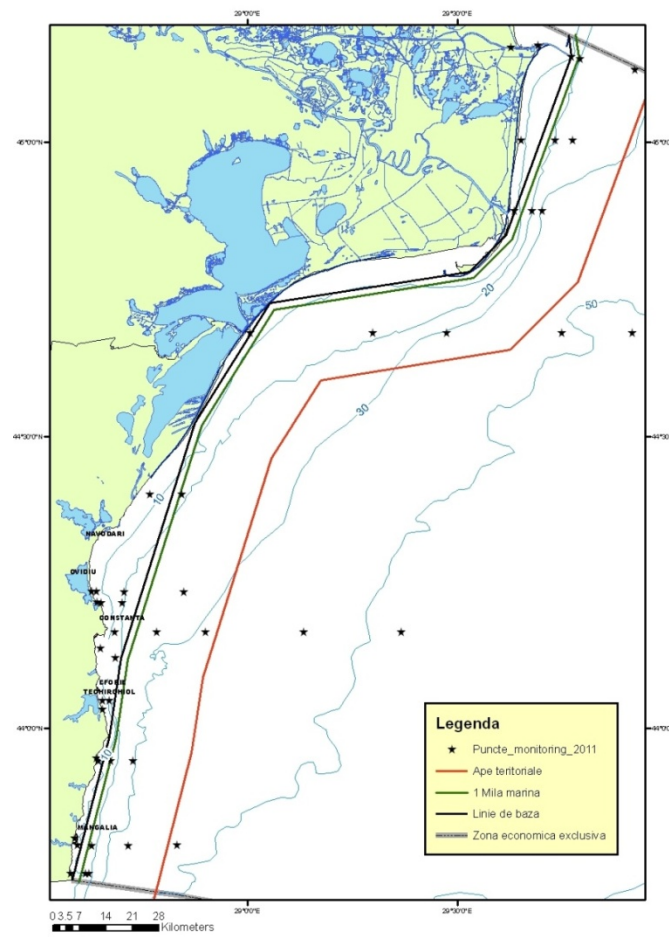
Quality elements		Parametrs	Frequency			
			Natural lakes Program surveillance	Reservoirs Program surveillance	Natural lakes Program operational	reservoirs Program operational
Biological elements	Phytoplankton	Composition of taxa (list and nr. of species) density (expl./l) biomass (mg/l)	4/year	4/year	4/year*	4/year*
	Microfitobentos	Composition of taxa (list and nr. of species) density (exp./m <sup>2</sup> )	1/year	1/year	2/year	2/year
	Macrofites	Composition of taxa (list and nr. of species) density (exp./m <sup>2</sup> )	1/3 years	1/3 years	1/3 years	1/3 years
	Zoobentos	Composition of taxa (list and nr. of species) density (exp./m <sup>2</sup> )	1/year	1/year	1/year	1/year
	Fish fauna	Composition of taxa (list and nr. of species) density (exp /100m <sup>2</sup> ) structure on ages	1/3 years	1/3 years	1/3 years	1/3 years
Hydro morphological elements	hydrological parameters	Water level and inflow and outflow rates	1-30 / 30 days	1/day	1-30 / 30 days	1/day
		Retention time	1/6 years	1/6 years	1/6 years	1/6 years
		Connectivity of lake to GWB	1/3 days	1/3 days	1/3 days	1/3 days
	Morphological parameters	Variation of depth	1/6 years	1/6 years (variable)	1/6 years	1/6 years(variable)
		Volume and structure of lake bed	1/6 years	1/6 years (variable)	1/6 years	1/6 years (variable)
		Structure of lake bank	1/6 years	1/6 years	1/6 years	1/6 years

# **MSFD National monitoring programme**

- National integrated monitoring programme is address to coastal, transitional, and marine waters
- The data cover another directives, as WFD, Habitat Directive, Urban Waste Water Treatment Directive, Bathing Waters



# Map of sampling stations



# National Monitoring Programme

## List of monitored parameters:

### **WATER:**

- temperature, transparency, salinity, pH, dissolved oxygen, oxygen saturation %, , nutrients (N-NO<sub>2</sub>, N-NO<sub>3</sub>, N-NH<sub>4</sub>, P-PO<sub>4</sub>, P Total, Si-SiO<sub>4</sub>);
- contaminants: total petroleum hydrocarbons, heavy metals, organochlorinated , pesticides, polyaromatic hydrocarbons (PAH);

### **SEDIMENTS:**

- contaminants: -total petroleum hydrocarbons, heavy metals, organochlorinated pesticides, polyaromatic hydrocarbons (PAH);

### **BIOTA:**

- contaminants: -heavy metals, organochlorinated pesticides;
- Biological parameters: phytoplankton, zooplankton, macrozoobenthos;



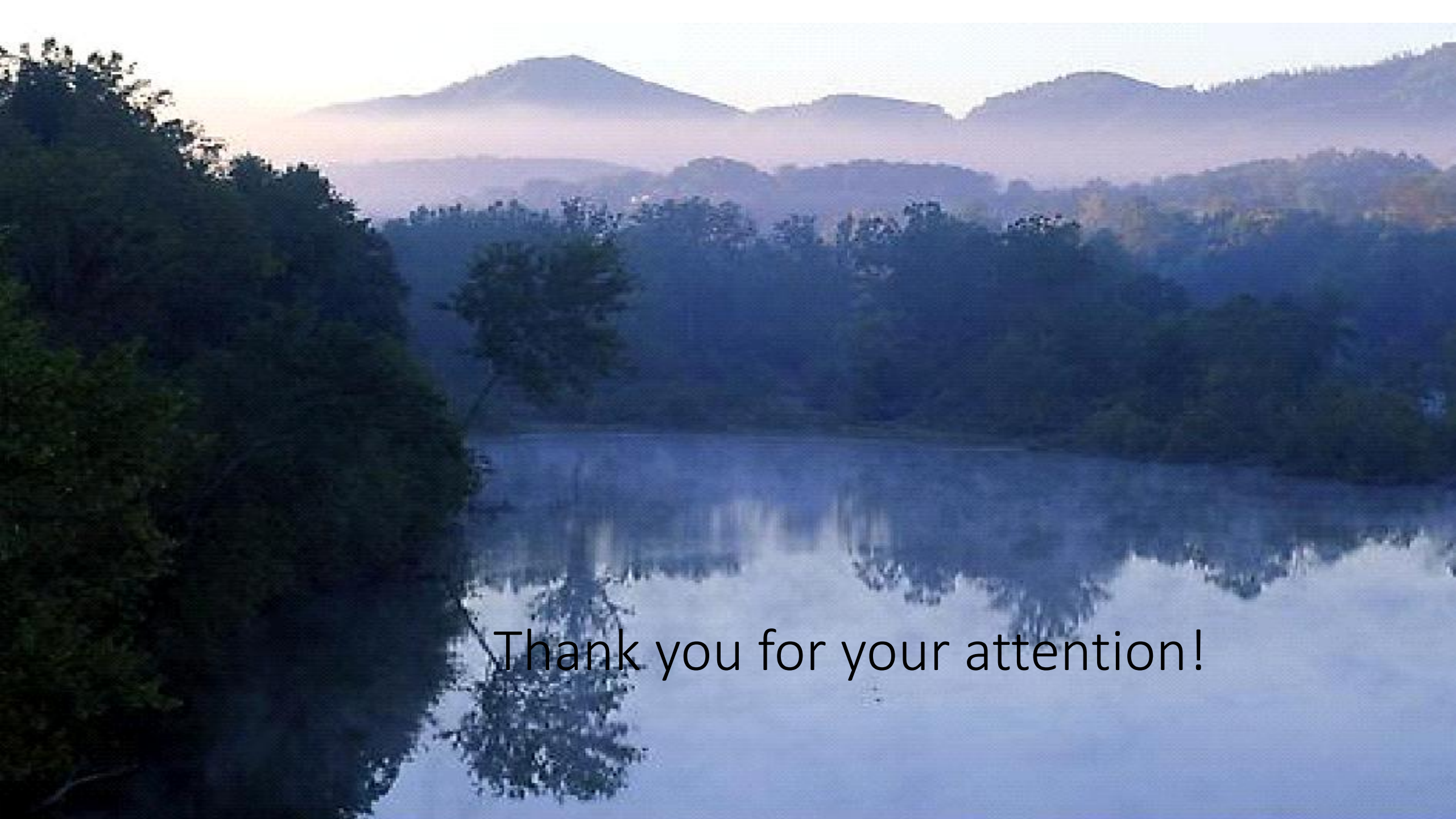
# Outstanding issues (national)

- Increase the numbers of marine stations for monitoring
- Introduction of new monitoring parameters: upwelling, water bodies from the western part
- Extending the monitoring for setting up GES and environmental targets for all descriptors
- Increase the number of biological elements within the monitoring
- Training for using new methods for:
  - contaminants
  - biological elements (angiosperm, macroalge)
  - establish geographical scales on the Black Sea marine region
  - on sampling, treatment and analysis for samples from different matrixes (with focus on biota samples);

# Outstanding issues (regional level)

- Harmonize the GES and environmental targets
- Harmonize the existing methods
- Developing the work plan for filling gaps for the preparation of second reporting cycle
- Involving the third countries or the Black Sea Commission to achieve the GES by 2020





Thank you for your attention!