



Main messages, targets and indicators for the Good Environmental Status from initial assessments

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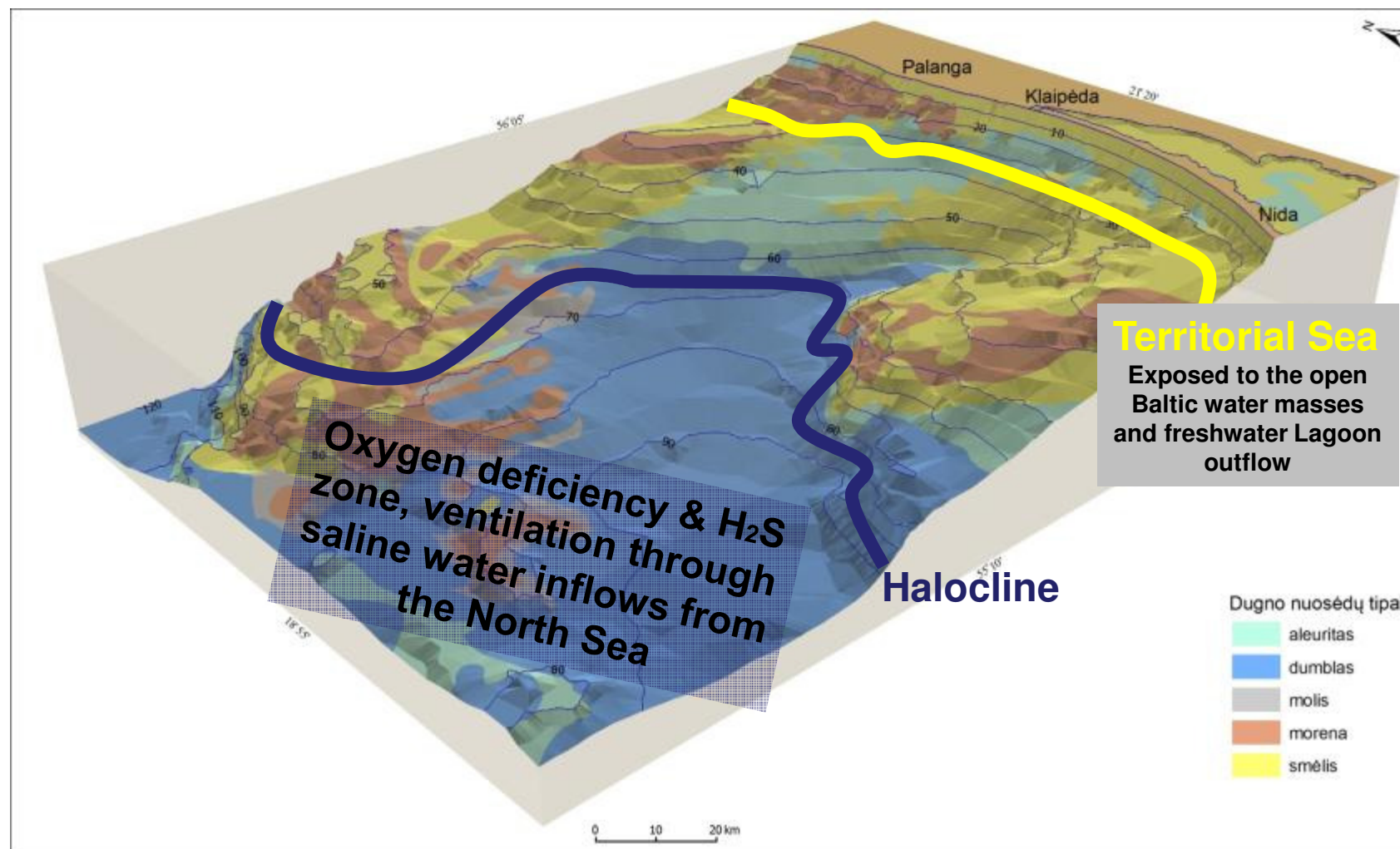


The Lithuanian sector of the Baltic Sea



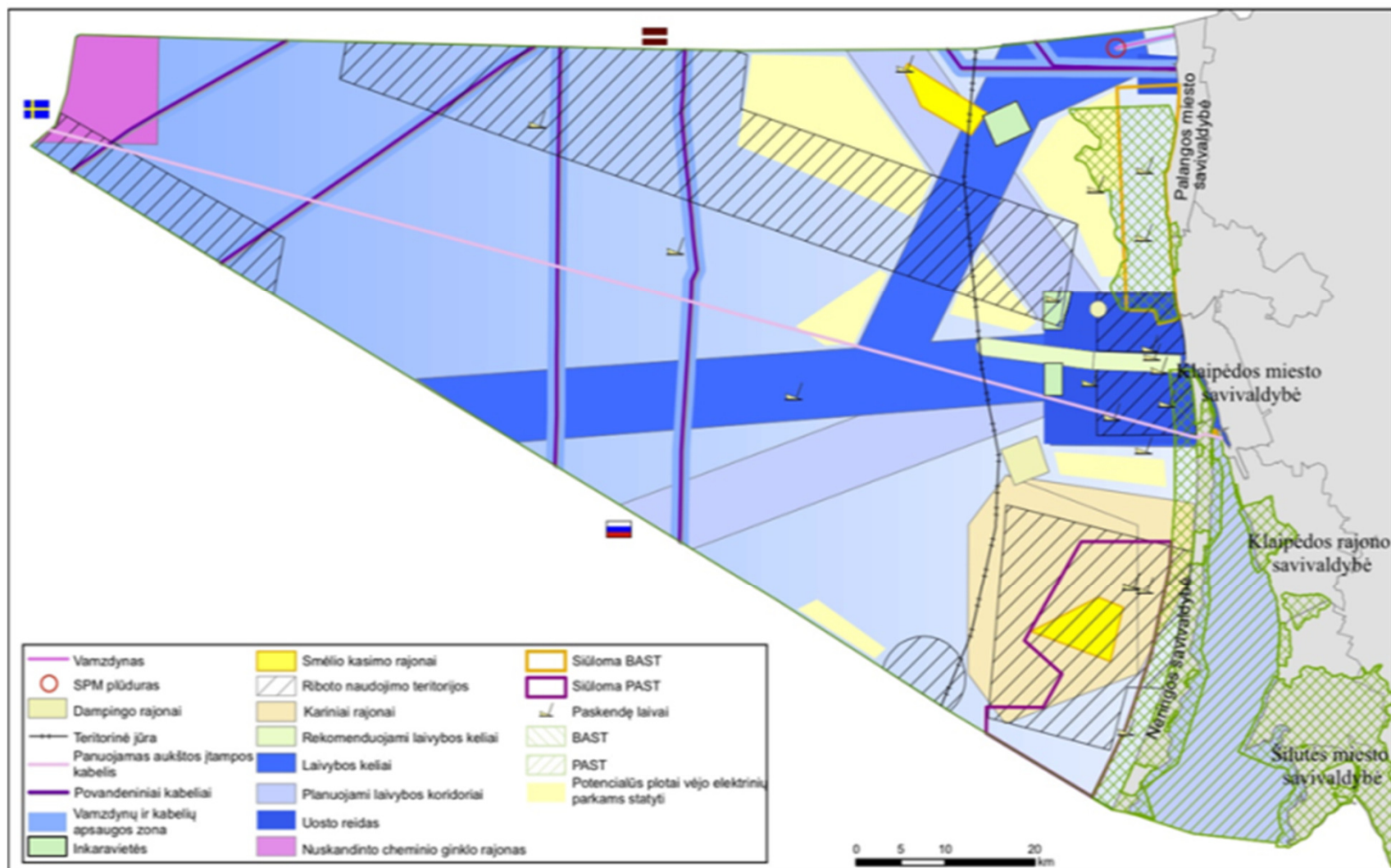
From: HELCOM, 2008)

The Lithuanian sector of the Baltic Sea



3D visualization: V. Jurkin

The Lithuanian sector of the Baltic Sea



Map: N. Blazauskas

Main messages (Article 8)

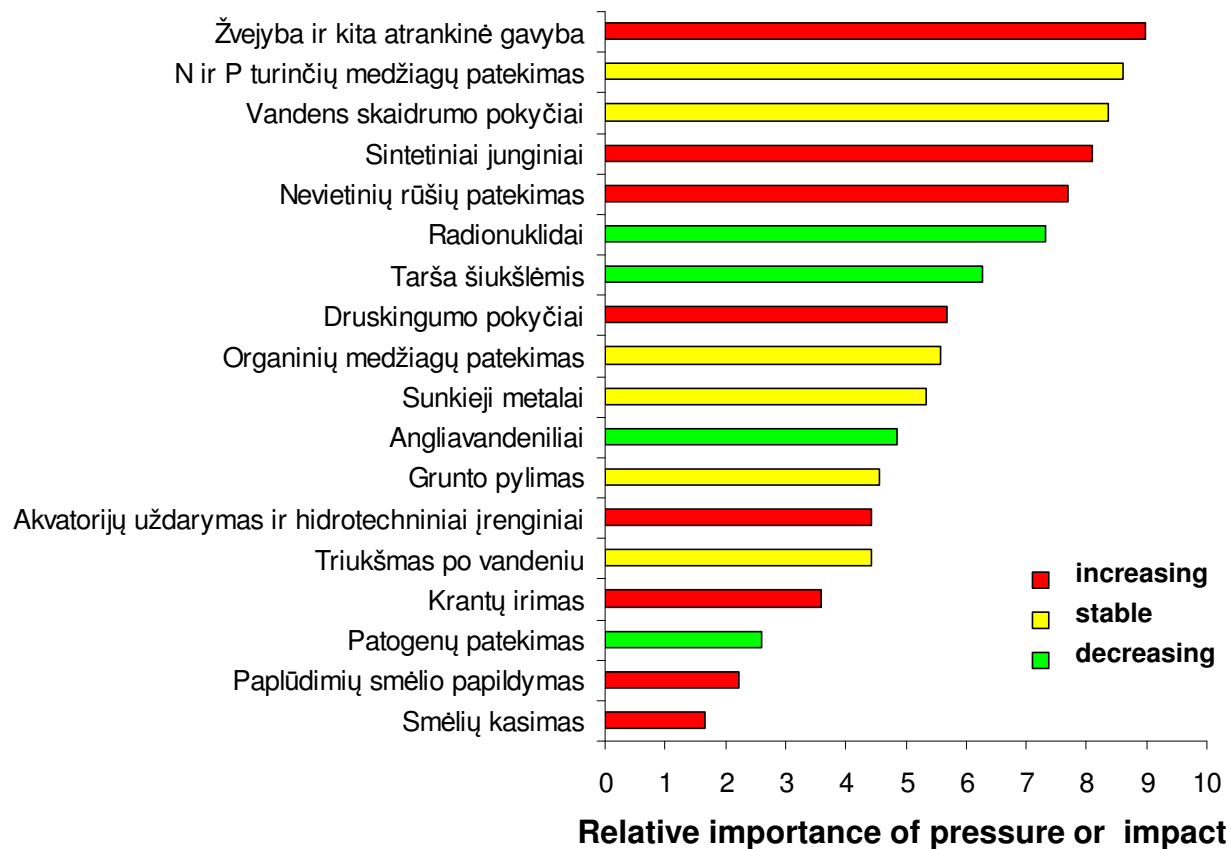
- Environmental monitoring served main data source for such assessment, however data have limited integration possibilities
- Causal relationships are largely hidden and influencing factors are extremely difficult to differentiate in conditions of spatially overlapping human impacts
- High exposure and freshwater influence result in high variability of environmental conditions and large background noise, which obscure identification of responsible human impacts
- It seems that consideration of Baltic wide processes is of the same importance as evaluation of transboundary effects (larger than national spatial scales are needed in assessments?)



Main messages (Article 8)

Relative pressure importance (expert judgment) is based on spatio-temporal scale of the impact and recoverability of an indicator (biodiversity, food webs, seafloor integrity). Likely trend in pressure importance was estimated until 2020.

Pressures and impacts (MSFD Annex III)



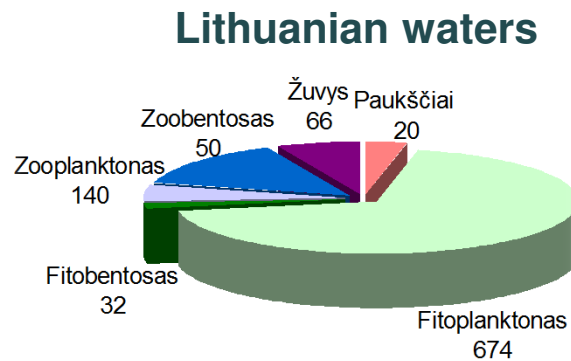
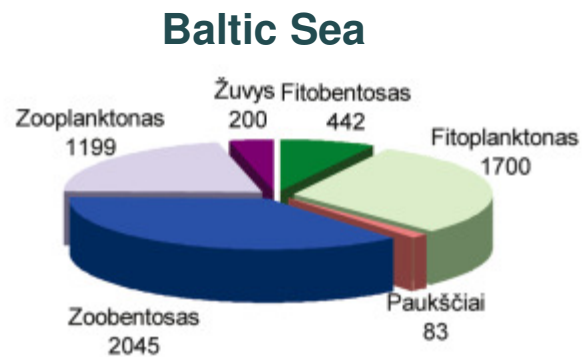
Indicators (Article 9)

Descriptor and associated indicators	Number of indicators
<i>Biological diversity:</i>	11
1. Abundance of wintering populations of seabirds	7
2. By-catch of seabirds	1
3. Proportion of oiled seabirds	1
4. Fish community diversity index	1
5. Fish community trophic index	1
<i>Non-indigenous species:</i>	2
1. Trends in arrival of new non-indigenous species	1
2. Biopollution index	1
<i>Population of commercial fish:</i>	11
1. Commercial fishing mortality	3
2. Proportion of fish larger than the mean size of first sexual maturation	4
3. 95% percentile of the fish length distribution observed in research vessel surveys	4
<i>Elements of marine food webs:</i>	9
1. Fish community size index	1
2. Fish community abundance index	1
3. Biomass of copepods	1
4. Biomass of microphageous mesozooplankton	6
<i>Eutrophication:</i>	10
1. Nutrients concentration in the water column	6
2. Chlorophyll concentration in the water column	2
3. Water transparency	1
4. Lower depth distribution limit of sensitive macrophyte species	1
<i>Contaminants:</i>	22
1. Hazardous substances in the water	10
2. Hazardous substances in the sediments	12
<i>Contaminants in fish and seafood for human consumption:</i>	6
1. Contaminants in fish	6
Total	69

Biodiversity

Baltic Sea – 6 thous. species,
– 4,7% marine birds, fishes and mammals.

Lithuanian waters – 1 thous. species,
– 8,7% marine birds, fishes and mammals.



Indicators:

1. Abundance of wintering populations of seabirds
2. By-catch of seabirds
3. Proportion of oiled seabirds
4. Fish community diversity index
5. Fish community trophic index

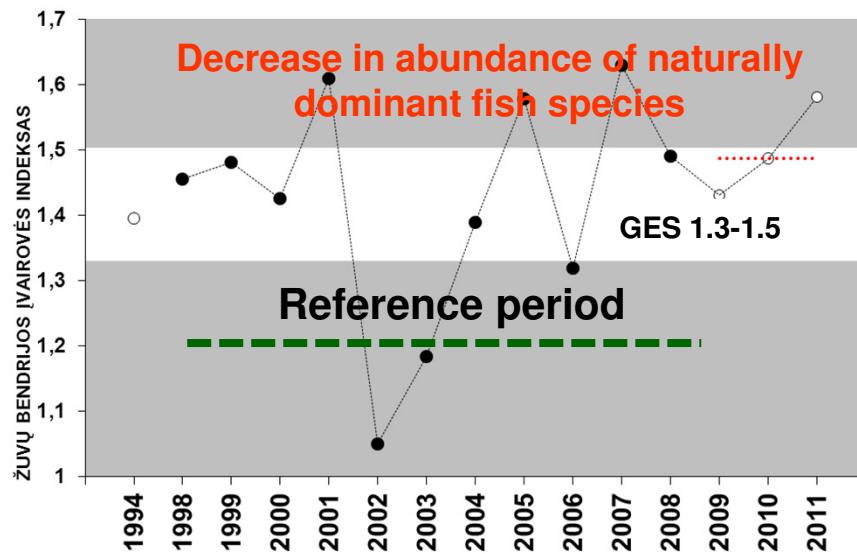


Fishes

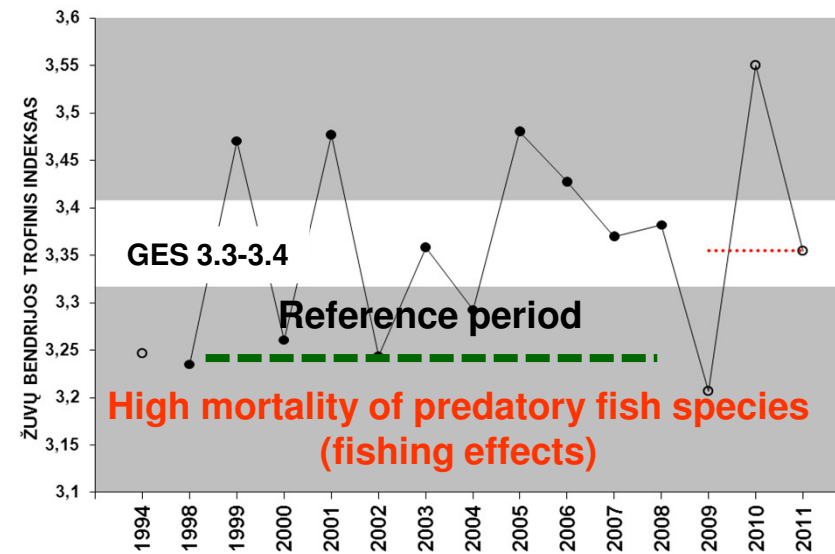
Indicators:

- Shannon diversity index of coastal fish community
- Trophic index of coastal fish community

Shannon diversity index
(coastal fish community)



Trophic index
(coastal fish community)

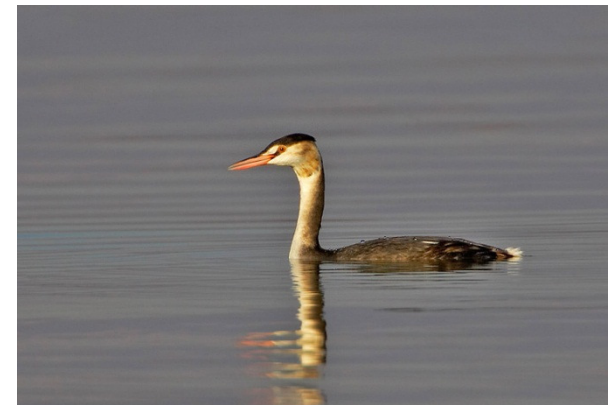


Wintering birds



Main impacts:

- changes in food sources
- habitat change
- oil contamination, commercial fishing and disturbance
- meteorological conditions



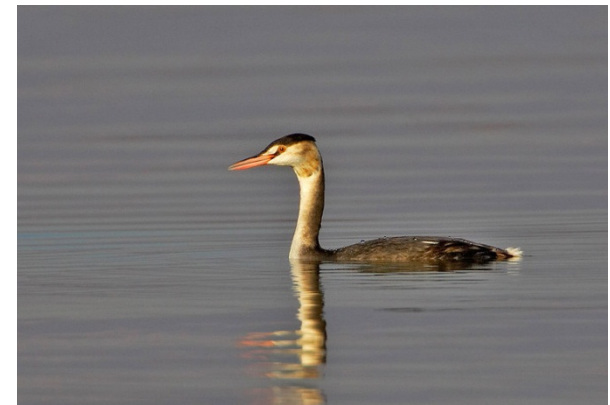
Wintering birds (concentration of bird populations)



Indicator: concentration of wintering bird populations

Indicatory species: Black-throated and black-throated Divers, Velvet Scoter, Great Crested Grebe, Long-tailed Duck, Steller's Eider, Common Goldeneye, Common Guillemot, Little Auk

GES (so far): 2002–2011 concentration average - 20%

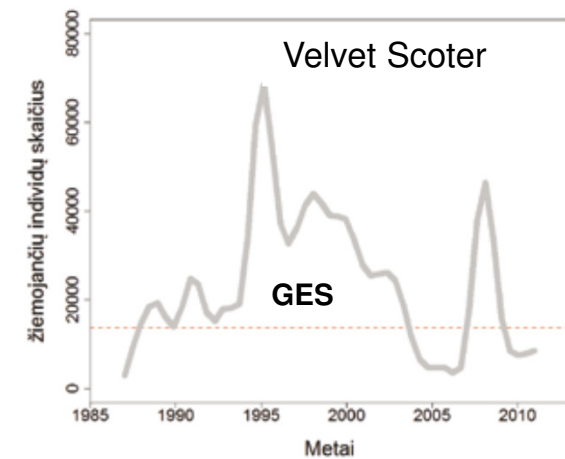
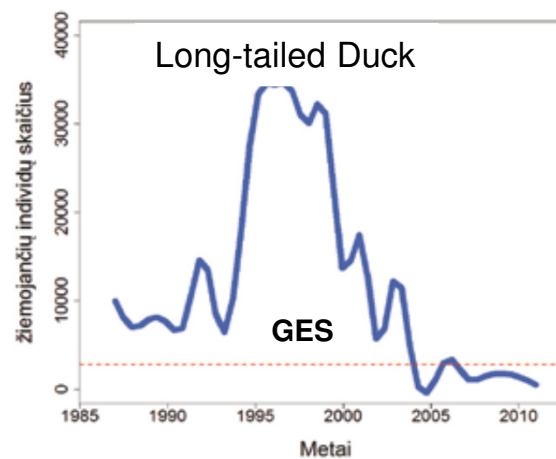


Wintering birds (concentration of bird populations)



Expected reasons:

- fishing, pollution and eutrophication in wintering areas
- predator impacts during reproduction
- climatic conditions (changes in distribution)

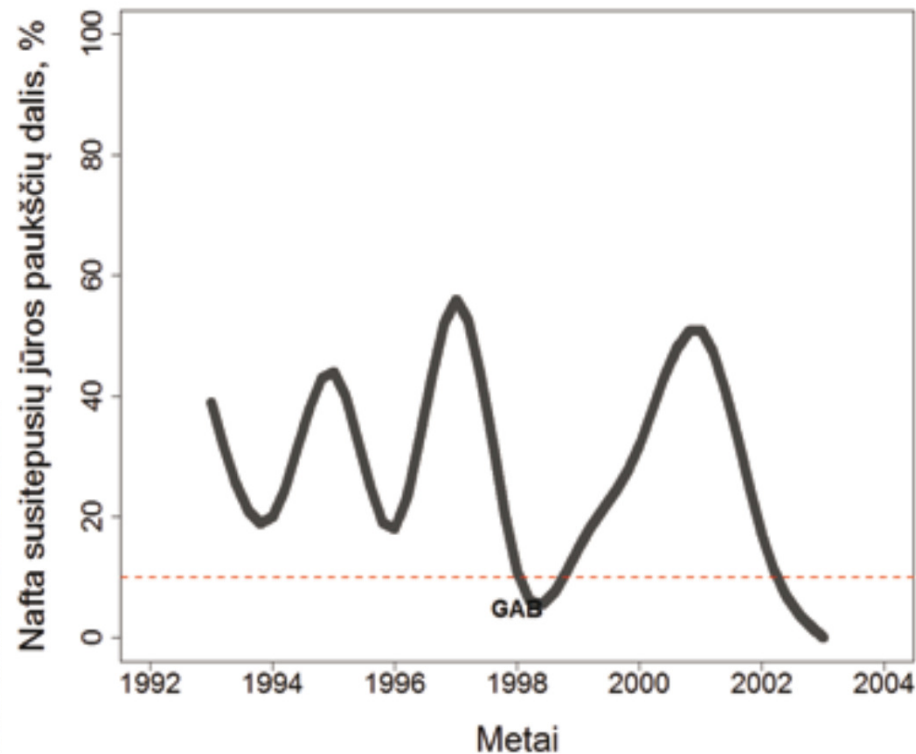


Wintering birds (oiled birds)

Indicator: proportion of oiled marine birds

Method: coastline count surveys of dead birds

GES: not more than 10% of dead oiled marine birds (to be adjusted for defined species / ecological groups of marine birds)



Wintering birds (by-catch)



Indicator: by-catch of marine birds (function of bird density and fishing effort).

Estimated to be 10-15% of the total wintering bird number, the most critical down to 15 m depth

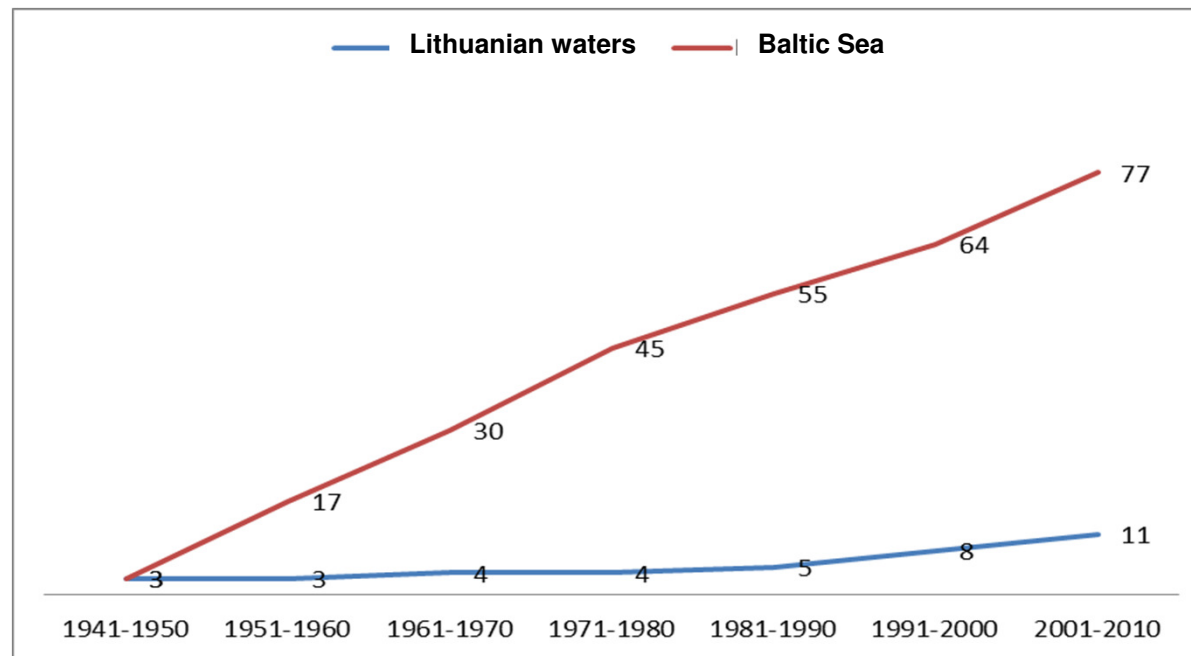
Potential biological removal – defines the highest possible mortality caused by all human factors, which is not causing significant negative impact for species population (takes into account minimum population size, population recovery factor, max population growth).

Species specific GES (estimated to be 3.7% for Long-tailed Duck)



Non-indigenous species

- introductions of non-indigenous species do not cause negative ecosystem changes:
 - no new species introductions into the ecosystem
 - impacts of non-indigenous species are not increasing

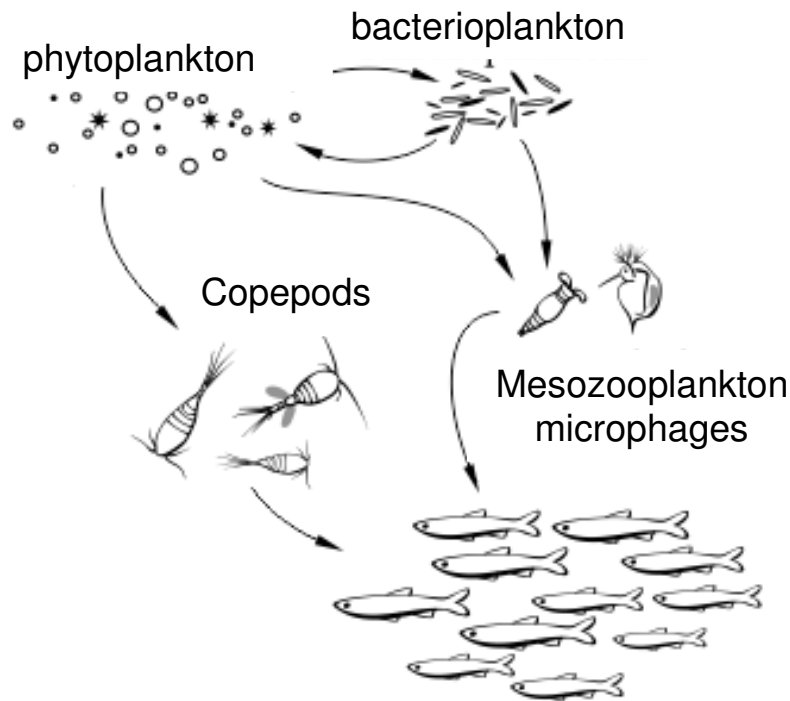


Non-indigenous species

Baseline assessment of biopollution index the period of 1990-2010:

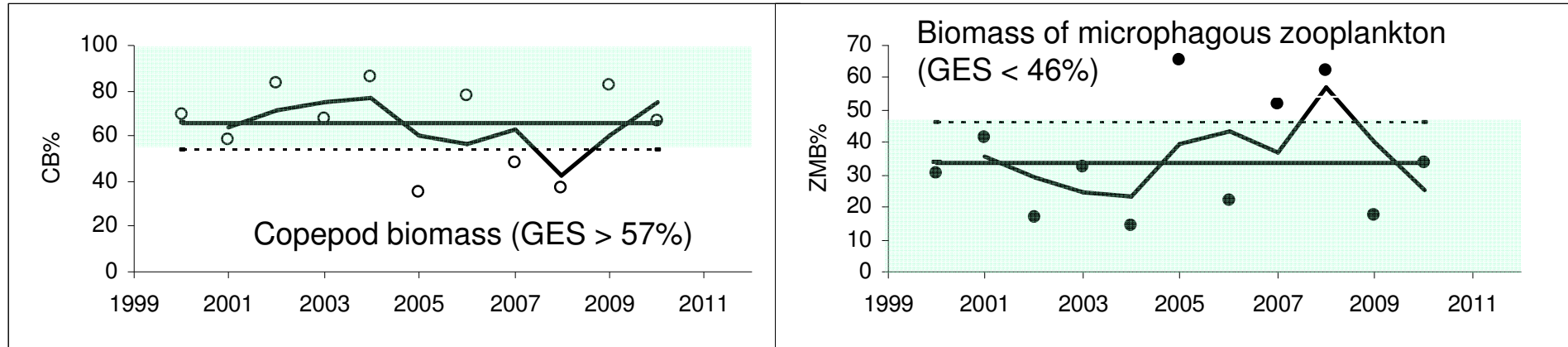
Species	ADR	C	H	E	BPL
<i>Acartia tonsa</i>	B	C1	H0	E0	1
<i>Anguillicola crassus</i>	A	C0	H0	E0	0
<i>Balanus improvisus</i>	D	C2	H1	E2	2
<i>Cercopagis pengoi</i>	D	C2	H1	E1	2
<i>Chelicorophium curvispinum</i>	C	C1	H1	E1	2
<i>Cordylophora caspia</i>	B	C1	H1	E0	1
<i>Eriocheir sinensis</i>	A	C0	H0	E0	0
<i>Gammarus tigrinus</i>	C	C1	H0	E1	2
<i>Marenzelleria neglecta</i>	D	C2	H1	E2	2
<i>Mya arenaria</i>	C	C1	H1	E1	2
<i>Neogobius melanostomus</i>	B	C0	H0	E1	1
<i>Prorocentrum minimum</i>	E	C3	H2	E2	3
<i>Rhitropanopeus harrisii</i>	A	C0	H0	EN	0

Marine food-webs

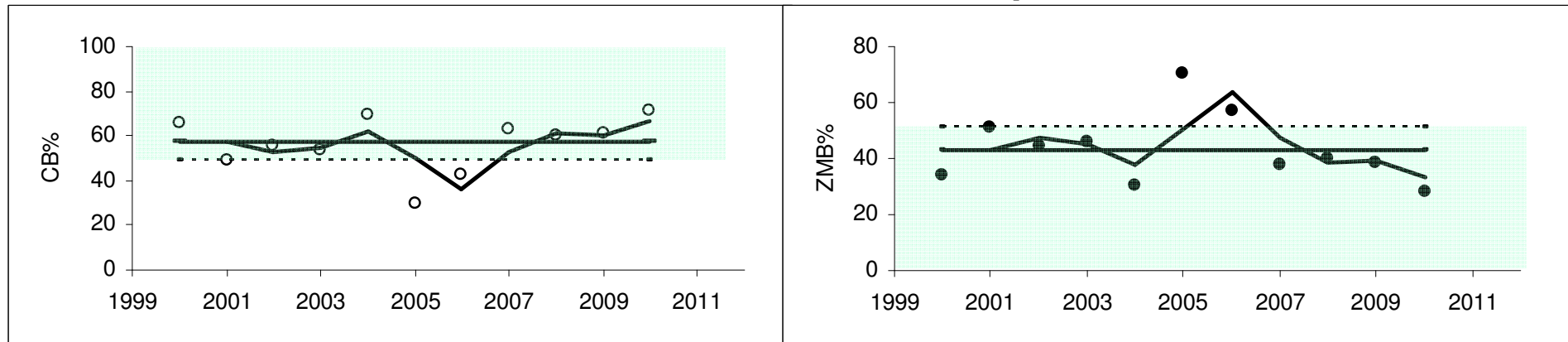


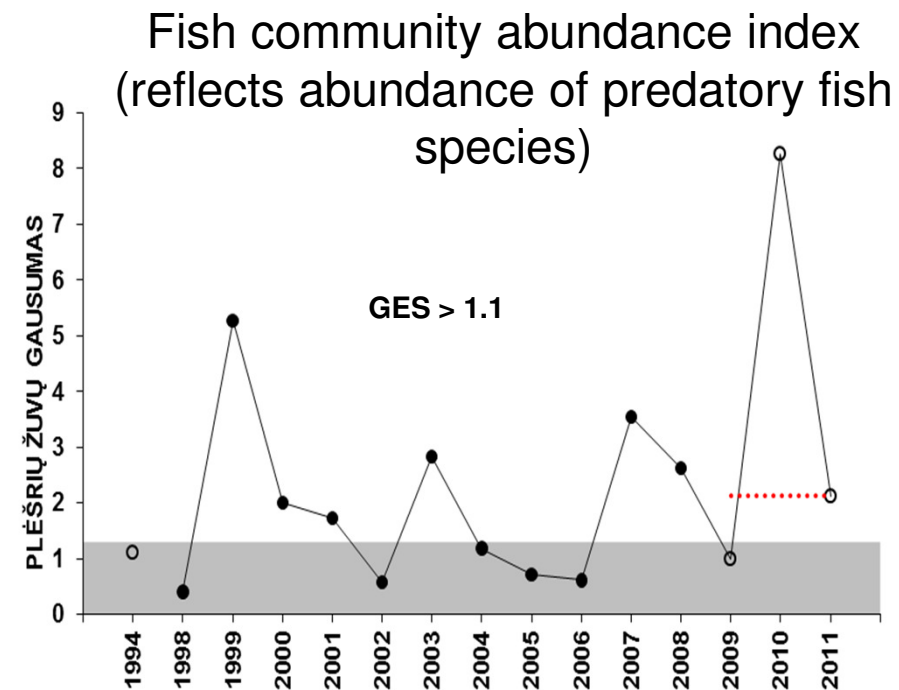
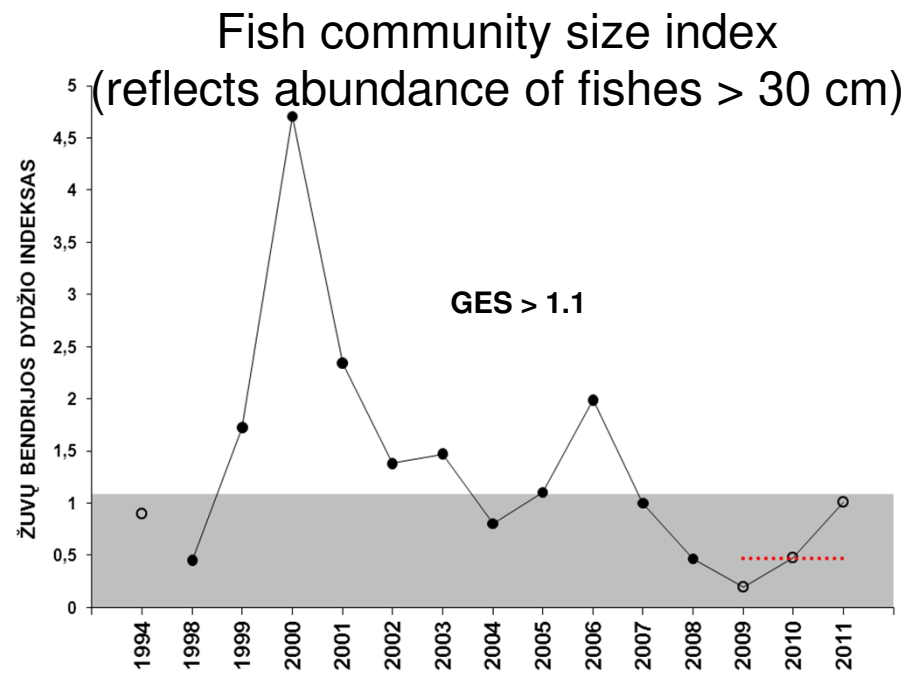
- **Biomass of copepods** - the higher biomass of copepods, the better feeding conditions for planktophagous fishes.
- **Microphagous zooplankton** - increased eutrophication results in higher abundance of small phytoplankton and bacterioplankton, which serve the main food component for microphagous zooplankton. The later is decreasing efficiency of energy transfer from primary producers to the higher trophic levels.

Offshore waters (20-60 m depth)



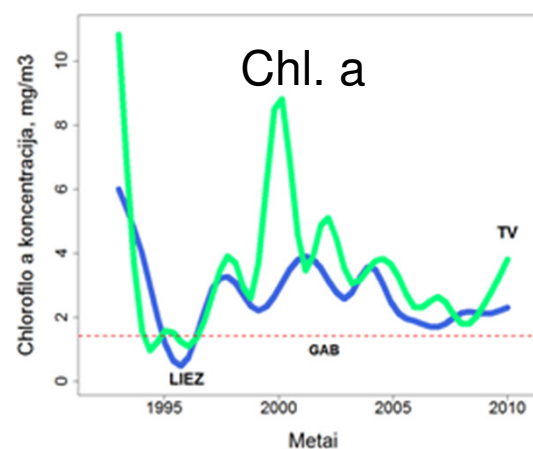
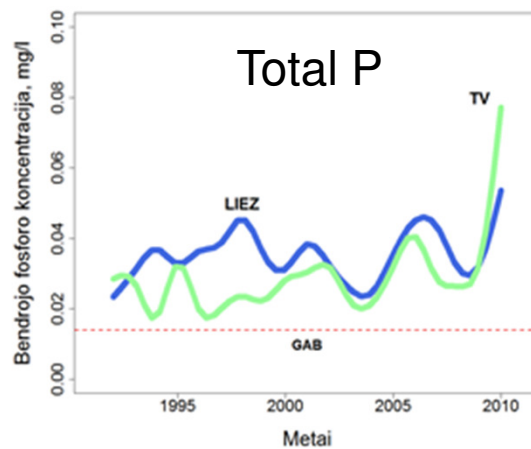
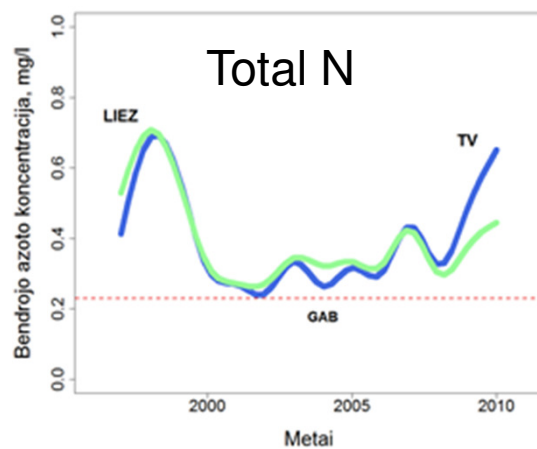
Coastal waters (<20 m depth)



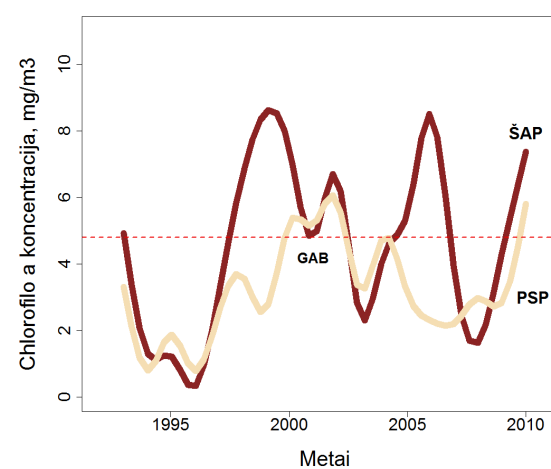
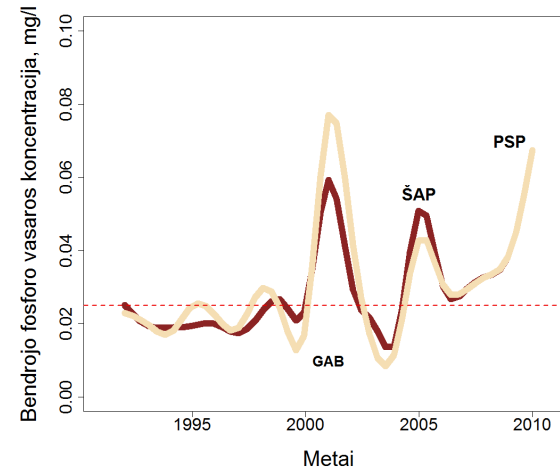
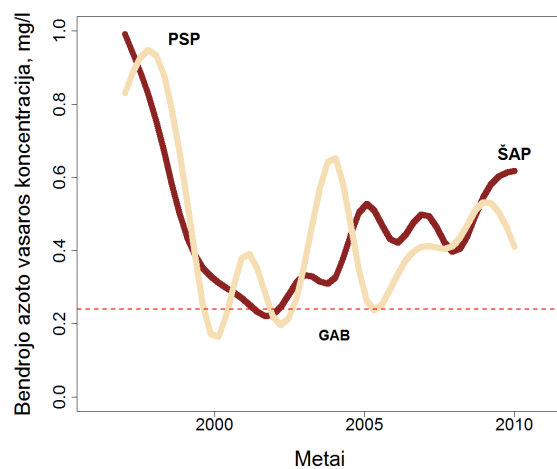


Eutrophication (nutrients and phytoplankton)

Offshore waters

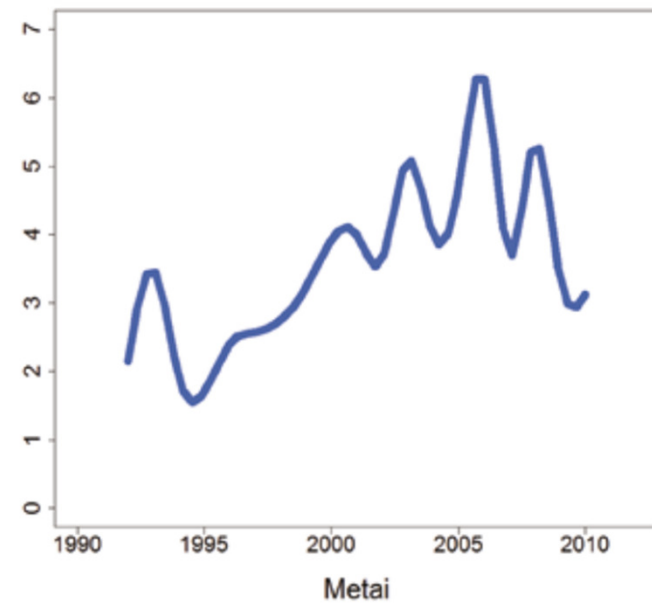
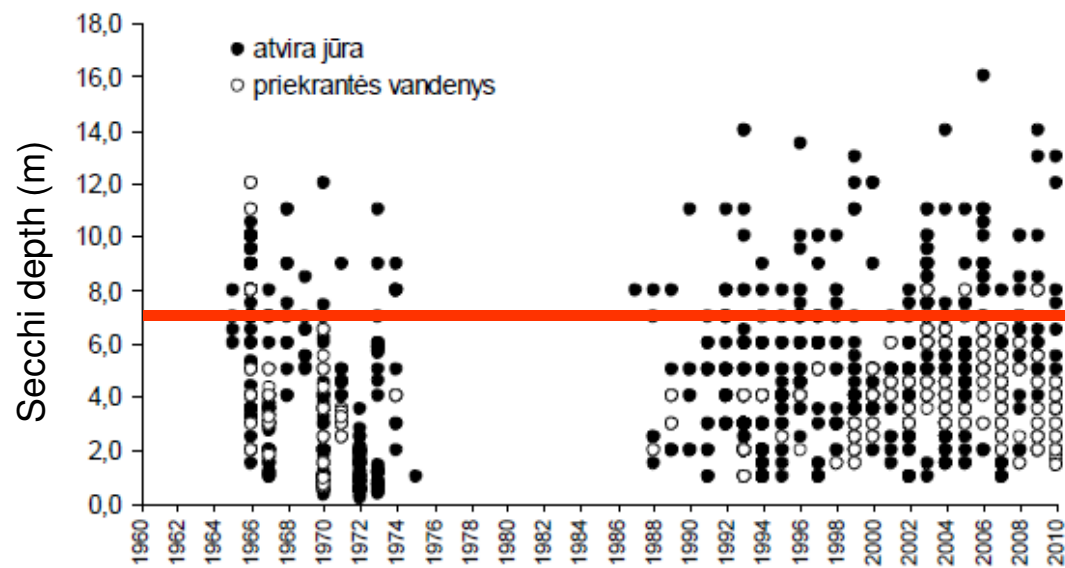


Coastal waters



Eutrophication (water transparency)

Offshore waters

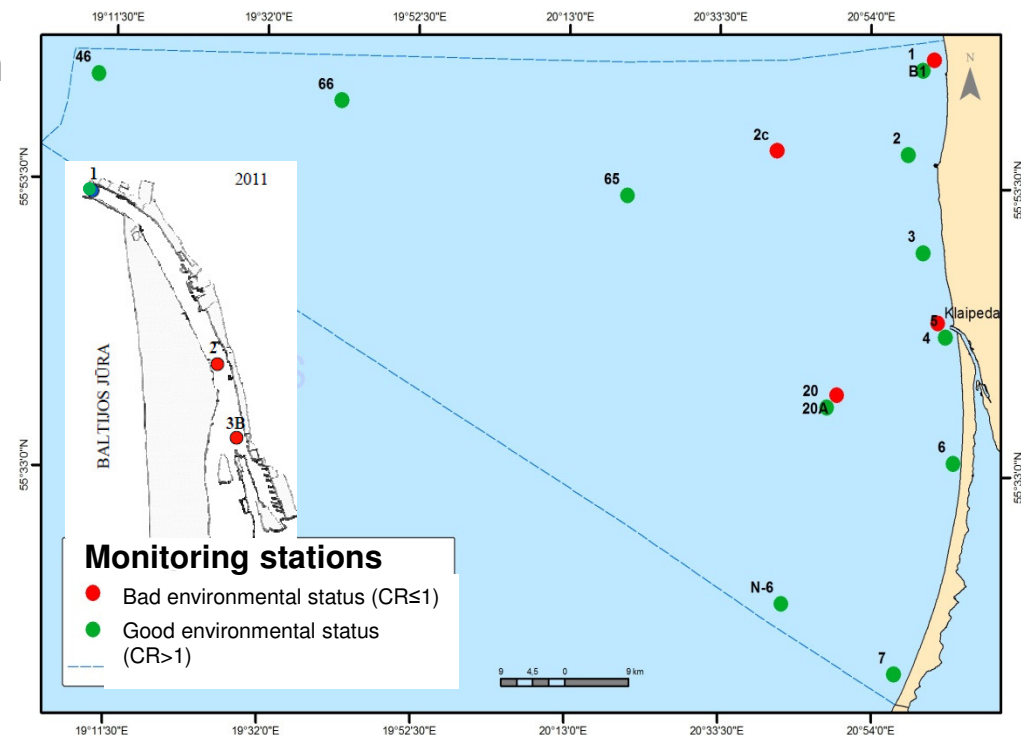


Contaminants

Concentrations of contaminants are at levels not giving rise to pollution effects.

Water and sediment contamination is mainly caused by:

- Curonian lagoon effluent waters;
- Butinge oil terminal;
- activities in Klaipeda and Sventoji ports;
- shipping and dumping in the sea;
- accidents;
- economic activity of neighboring countries (e.g. Sovetsk cellulose factory, Kaliningrad plants and oil platforms).



GES boundaries according to:

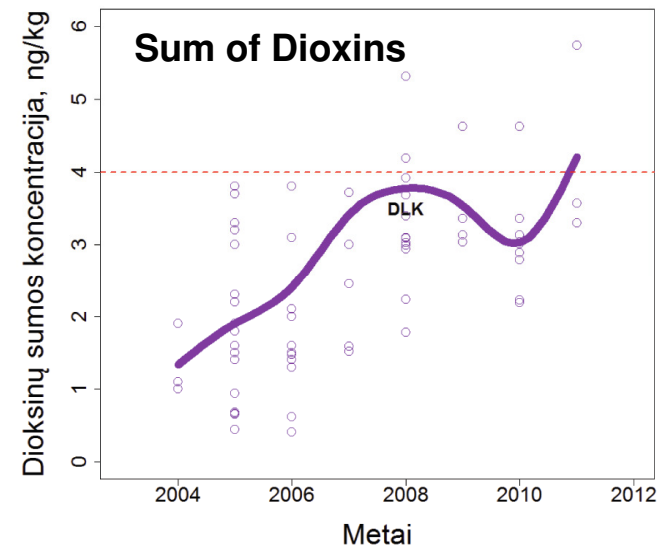
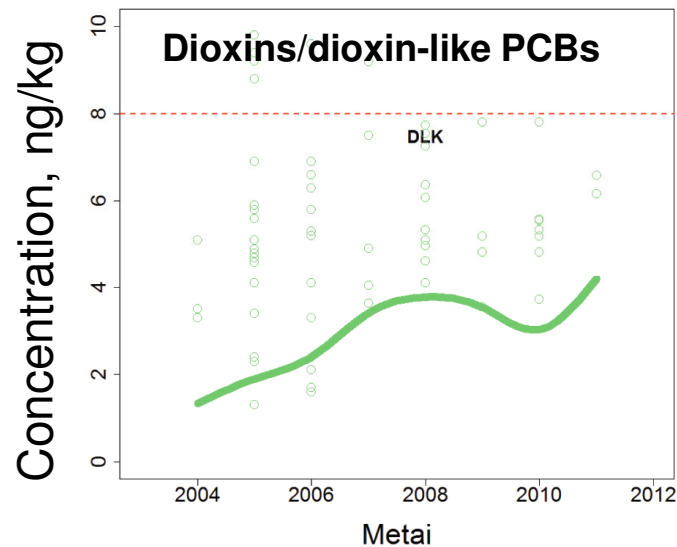
- HELCOM recommendations
- National wastewater management regulation
- EU directives e.g., EC Environmental quality standards (EB Nr. 1881/2006).

(9) Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards.

Maximum concentrations of cadmium and mercury in Cod's and flounder's muscles 2-6 times lower than the maximum allowable limits.

Concentrations of dioxins/dioxin-like PCBs in herring's, sprat's and salmon's muscles increased during 2004-2011.

Contaminants in fish tissues



Summary of environmental status assessment

Descriptor	Indicator	Environmental status					
I Biological diversity	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr></table>	1	2	3	4	5	Good
1	2	3	4	5			
II Non-indigenous species	<table><tr><td>1</td><td>2</td></tr></table>	1	2	Variable			
1	2						
III Population of commercial fish	<table><tr><td>1</td><td>2</td><td>3</td></tr></table>	1	2	3	Bad		
1	2	3					
IV Elements of marine food webs	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	1	2	3	4		
1	2	3	4				
V Eutrophication	<table><tr><td>1</td><td>2</td><td>3</td><td>4</td></tr></table>	1	2	3	4		
1	2	3	4				
VIII Contaminants	<table><tr><td>1</td><td>2</td></tr></table>	1	2				
1	2						
IX Contaminants in fish and seafood for human consumption	<table><tr><td>1</td></tr></table>	1					
1							



Environmental impacts

Eutrophication

Contaminants

Non-indigenous species

Commercially exploited fish

Underwater noise and physical disturbance

Marine litter

Coastal erosion and hydrographic changes

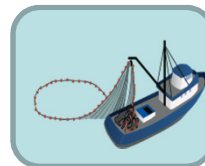
Dumping

Beach nourishment

Marine sectors



Shipping and ports



Fishing



Tourism



Industry, agriculture, households



**This study is a part of MSFD implementation
in Lithuania and supported by
Environmental Protection Agency, Ministry
of Environment**

Bendras ir galutinis jūros aplinkosaugos tikslas yra išlaikyti biologinę įvairovę ir užtikrinti švarią, palankią sveikatai ir produktyvią jūrą.

- užtikrinti centrinės Baltijos gamtinėms sąlygoms būdingą jūros ekosistemos funkcionavimą, dugno buveinių struktūrą ir plotą, o taip pat jūros paukščių, žuvų bei jiems svarbių, žemesnėms mitybos grandims priklausančių, jūros organizmų įvairovę, gausumą ir paplitimą;
- reguliuoti ir su tarptautiniais susitarimais derinti verslinės žvejybos pastangas siekiant užtikrinti tvariam naudojimui būdingus menkių, brėtlingių ir strimelių populiacijų dydį, išgyvenamumą ir atsinaujinimą;
- mažinti ir valdyti cheminę taršą taip, kad jūros vandenyje, dugne ir jūros organizmuose nebūtų viršijamas tarptautiniais susitarimais nustatytas taršos lygis;
- diegti priemones, mažinančias Baltijos jūrai naujų nevietinių rūšių atsiradimo riziką Lietuvos jūrinėje teritorijoje.