

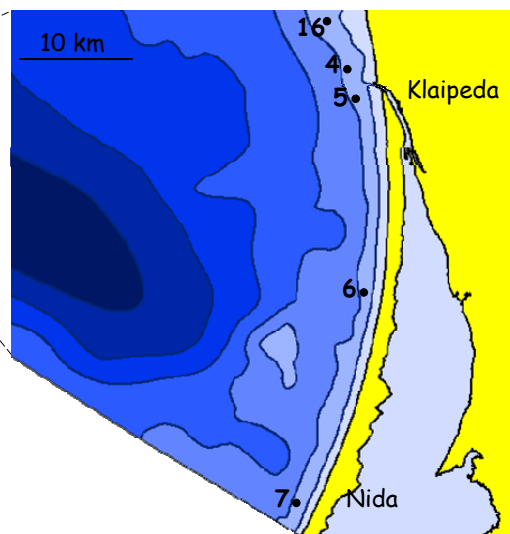


A system for the sustainable management of Lithuanian marine resources using novel surveillance, modeling tools and an ecosystem approach*

Development of benthic quality index (BQI) for the Lithuanian coastal waters

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5 monitoring sites
<20 m depth, soft bottom
94 macrozoobenthic samples
Sampling years: 1982-2009

BQI estimation

(Fleischer, Zettler 2009)

$$BQI_{ES} = \left(\sum_{i=1}^n \left(\frac{A_i}{A_{tot}} \times ES_{50,0.05i} \right) \right) \times \log(ES_{50} + 1) \times \left(1 - \frac{5}{5 + A_{tot}} \right)$$

A_i - the abundance of the species i

A_{tot} - the sum of all individuals

$ES50_{0.05}$ is the sensitivity/tolerance value for species i

ES50_{0.05} values and sensitivity classes

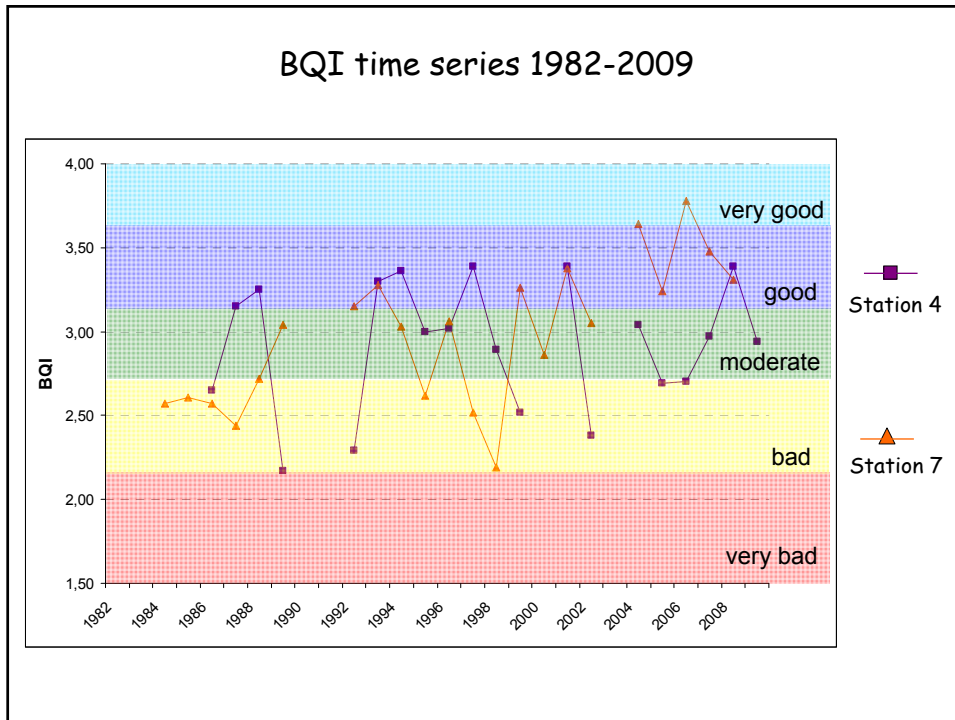
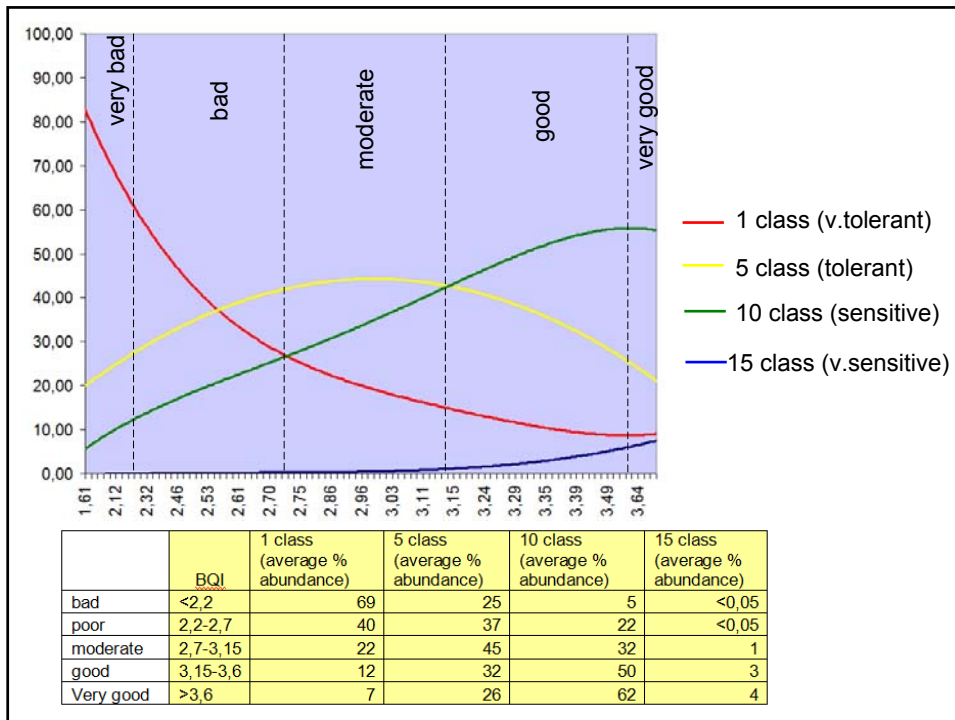
Taxon	ES50 _{0.05}	Current study	Latvian study	Polish study (Osowiecki et al. 2008)
<i>Pygospio elegans</i>	2,8	1	5	5
<i>Macoma balthica</i>	3,4	5	5	5
Oligochaeta	3,4	5	1	1
<i>Saduria entomon</i>	3,4	5		10
<i>Harmothoe sarsi</i>	3,5	5	10	10
<i>Marenzelleria neglecta</i>	4,1	10	5	5
<i>Corophium volutator</i>	4,3	10	10	10
<i>Hediste diversicolor</i>	4,3	10	5	1
<i>Hydrobia spp.</i>	4,4	10	5	5
<i>Mya arenaria</i>	4,4	10	10	10
<i>Bathyporeia pilosa</i>	4,5	10		15
<i>Cerastoderma glaucum</i>	4,8	10		10
<i>Halicryptus spinulosus</i>	5,1	15	15	15
Nemertini	5,6	15	10	
<i>Streblospio shrubsoli</i>	5,8	15		5

1 class (very tolerant species) $ES50_{0.05} < 3$

5 class (tolerant species) $3 \leq ES50_{0.05} < 4$

10 class (sensitive species) $4 \leq ES50_{0.05} < 5$

15 class (very sensitive species) $ES50_{0.05} \geq 5$



Further work and recommendations

1. Better quantification of species sensitivity values, which are critical for development of water quality classification system, is obscured by weakly developed eutrophication gradients in the Lithuanian coastal waters
2. Testing of classification system against local and Baltic wide eutrophication indicators is needed till its approval for wider use
3. In order to make the system relevant for the eastern brackish waters of the Baltic Sea, its calibration with data from the Latvian and Polish open coastal waters will be needed.



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