

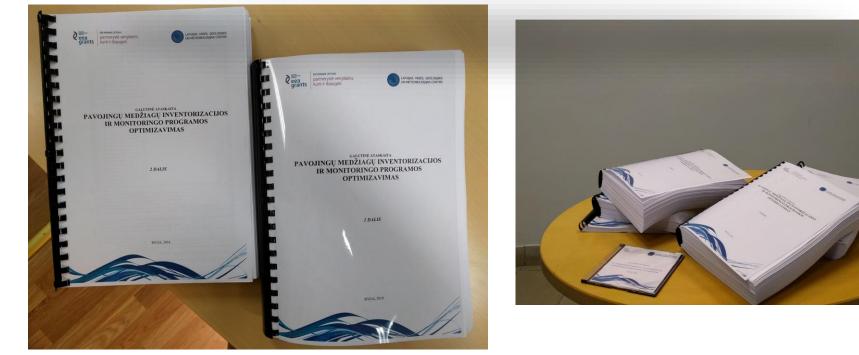


eee parama Lietuvai: partnerystė vertybėms kurti ir išsaugoti

### PRIORITY SUBSTANCES INVENTARIZATION AND MONITORING PROGRAMME OPTIMIZATION

JĀNIS ŠĪRE HEAD OF INLAND WATERS DIVISION LATVIAN ENVIRONMENTAL, GEOLOGY AND METEOROLOGY CENTRE 10.01.2017





### Main tasks



- **1.** Analysis of available environmental data;
- Monitoring of priority and hazardous substances in water, bottom sediments and biota, as well as in wastewaters and wastewater sludge;
- **3. Assessment of** water **chemical quality**, taking into account long-term data and results from implemented projects, trend analysis and program of measures;
- **4. Preparation of** optimized **monitoring program for priority and hazardous substances** for period 2016-2021.

### **Main activities**



- Analysis of sources of priority substances in surface waters and inventarisation of amounts of priority substances
- 2. Priority substances **monitoring** in surface waters, sediments, biota and wastewaters
- 3. Analysis of sources of priority pollutants in wastewaters
- **Review** of priority substances in surface waters in period 2000-2015
- 5. Monitoring programmes of priority substances in surface waters

### **SOURCE ANALYSIS & INVENTARISATION**



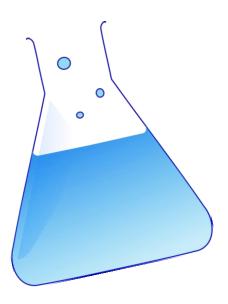
- Data analysis on point source data (waste water emissions)
- Data analysis on diffuse pollution (agriculture and atmosphere)
- Data analysis form Lithuanian data base about used, placed on market, imported and exported priority substances
- Summarized results from previous projects in all matrixes

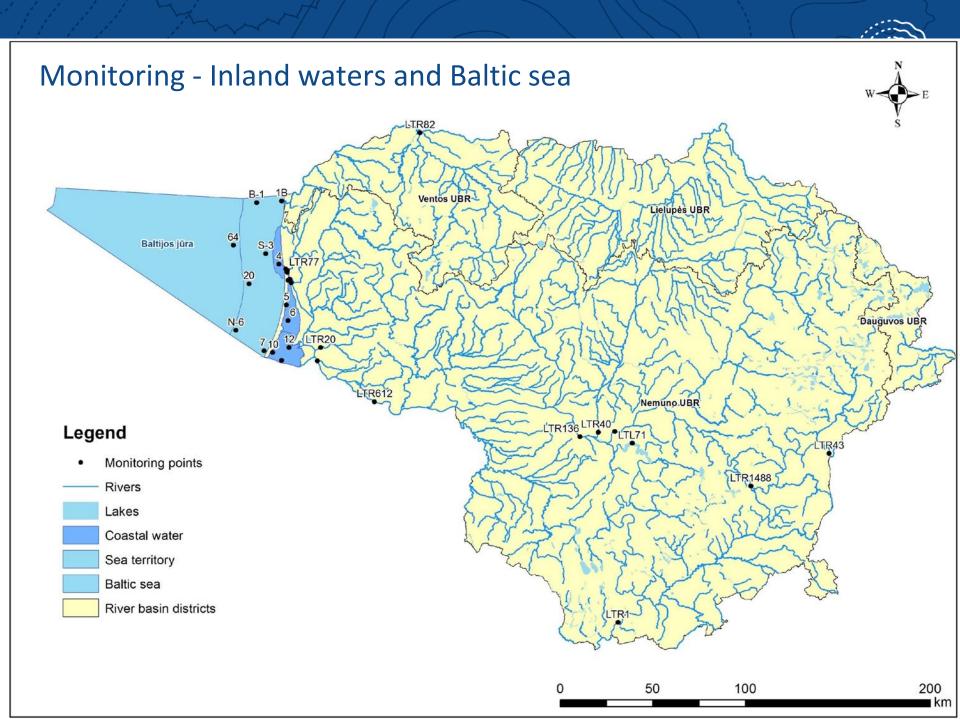
### Initial identification of problematic priority substances

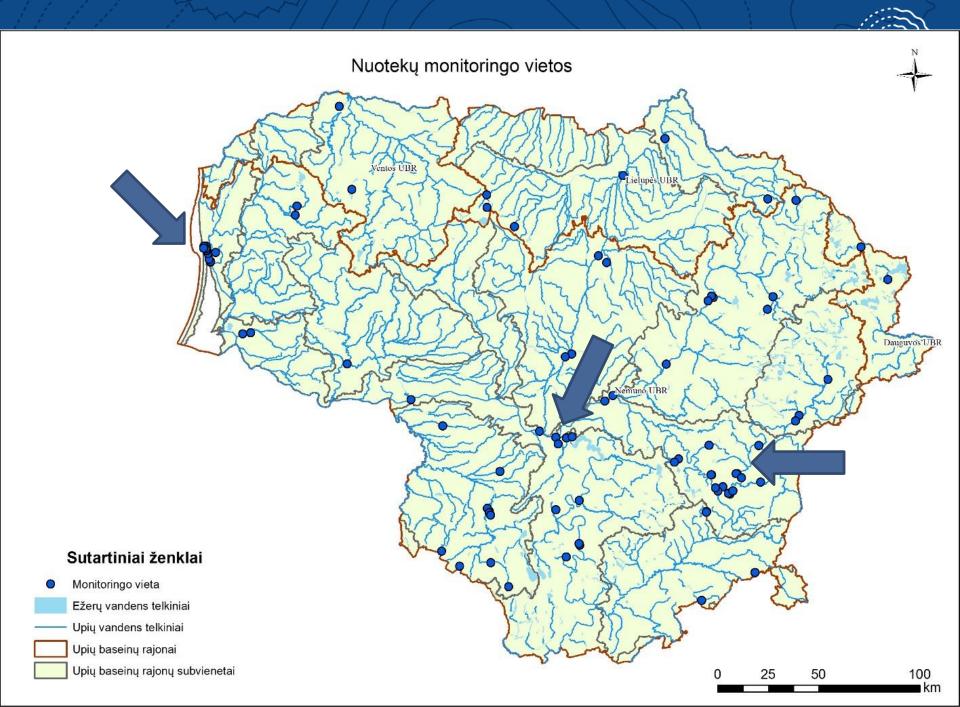




- Within current research all **45 priority substances** from EQS Directive 2013/39/EU were analyzed
- Watch list monitoring (EC decision 2015/495)







### **Problems occurred**



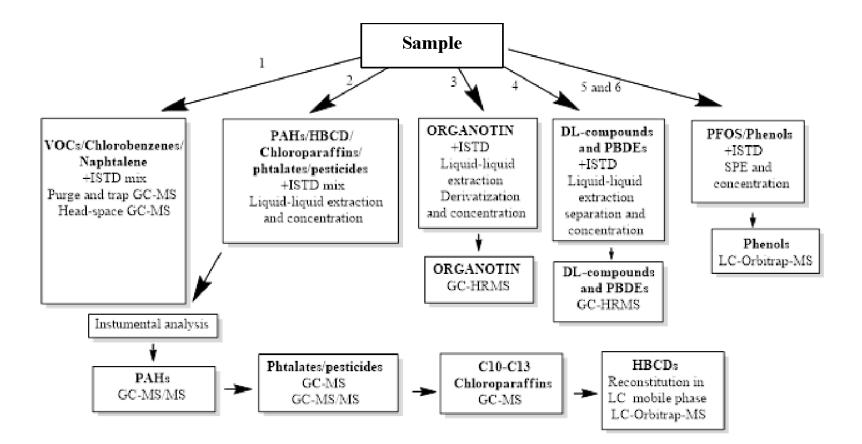
- Waste water monitoring:
  - dry autumn in 2015, so in many cases, samples were missing;
  - technical issues in some industries.

The missing samples were collected in the beginning of 2016 in other suitable places to cower amount of needed samples

- Inland waters and sea monitoring
  - weather conditions in the end of 2015 sea water samples could not be sampled samples collected March 2016
  - Biota samples form inland waters were sampled in 2016



### Analysis principial scheme





Institute of Food Safety, Animal Health and Environment "BIOR" **Diagnostic Center** Lejupes Street 3, LV-1076; phone: +37167611720 fax: +37167620343 e-mail: partika@bior.gov.lv



#### TEST REPORT № PV-2016-P-17301.01

	Instit	tute of Food	Safety, Anima	Health and	Hexabromocyclododecane	α-HBCD 8-HBCD
<b>BIOR</b>					(HBCD)	v-HBCD
ALERTUTE OF FOCO SA	TETS AND ALL REALTH		1	pes Street 3, LV	(1000)	Total-HBCD
THE INFORMATION CALL			Leju	pes street s, tv	Chloroalkanes (C10-C13)	Chlorolkanes (C10-
					Perfluorooctane sulfonic	PFOS
					acid and its derivatives	PFOA
						Nonyphenol (4-non
	т	EST REPORT	r			Octylphenol ((4- (1,
	Nº PV-	2016-P-173	01.01		Phenols	3,3'-tetrametilbuti
						Pentachlorophenol
	bility Company "Latvian Environ 191, address: Maskavas street 1				Tributyltin	Tributyltin cation
egistration Ne 501052577	91, address. Maskavas screet 1	105, Kiga, LV-1	019, e-mail. ivgn	icervgnic.iv, p		Alachlor
he complex were received	"BIOR" Food and Environment	tal investigation	a laboratory ab			Atrazine
				one. 6/611/2		Chlorfenvinphos
man. partika@bior.lv, 07.0	03.2016 (testing order No: VP-2	013-P-20259)				Chlorpyrifos(chorp
and and an Onlid and inter	Fred and an incoment					ethyl)
ype of order: Paid services.	. Food and environment.					Aldrin
	Testing	amples result	ts, methods and			Dieldrin
		plementary in				Endrin
	300	prementary i				Isodrin
17301/1 . REGISTRATION	NUMBER OF THE SAMPLE					Total-DDT
dentification number given						p-p-DDT
escription and identification	on of the sample: surface wate	er, samples am	ount: 1000 ml x	3 bottles		Diuron
upplementary information:	: no information		Second Second		Endosulfan <sup>(*)</sup>	
formation about sampling	g (according to the order for te	sting)				choosenan
formation about sampling Person performed sampling	g (according to the order for te ng: Liudmila Kondratjeva				Pesticides	Hexachlorobenzen Hexachlorobutadie
formation about sampling Person performed samplin Sampling plan and procedu	g (according to the order for te ng: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2		patvirtintas aplin	kos ministro 20	Pesticides	Hexachlorobenzen Hexachlorobutadie
nformation about sampling Person performed samplin Sampling plan and procedu Place of sampling: Baltijos	g (according to the order for te ng: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra		patvirtintas aplin	kos ministro 20	Pesticides	Hexachlorobenzen Hexachlorobutadie
formation about sampling Person performed samplin Sampling plan and procedu	g (according to the order for te ng: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra		patvirtintas aplin	kos ministro 20	Pesticides	Hexachlorobenzen Hexachlorobutadie Hexachlorocyclohe Isoproturon
nformation about sampling Person performed samplin Sampling plan and procedu Place of sampling: Baltijos	g (according to the order for te ng: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra		patvirtintas aplin	kos ministro 20	Pesticides	Hexachlorobenzen Hexachlorobutadie Hexachlorocyclohe Isoproturon Pentachlorobenzer Simazine
aformation about sampling Person performed samplin Sampling plan and proced Place of sampling: Baltijos Date, time of sampling: 02	g (according to the order for te ng: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2: jūra .03.2016	015 m. planas,			Pesticides	Hexachlorobenzen Hexachlorobutadie Hexachlorocyclohe Isoproturon Pentachlorobenzer
aformation about sampling Person performed samplin Sampling plan and proced Place of sampling: Baltijos Date, time of sampling: 02	g (according to the order for te gr. Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra .03.2016 d and environmental investigation laborator	015 m. planas,			Pesticides	Hexachlorobenzen Hexachlorobutadie Hexachlorocyclohe Isoproturon Pentachlorobenzer Simazine
nformation about sampling Person performed samplin Sampling plan and procedu Place of sampling: Baltijos Date, time of sampling: 02	g (according to the order for te gr. Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra .03.2016 d and environmental investigation laborator	015 m. planas,	(s) of beginning of tests		Pesticides	Hexachlorobutadie Hexachlorobutadie Hexachlorocyclohe Isoproturon Pentachlorobenzer Simazine Trifluralin Dicofol Quinoxyfen
Normation about sampling Person performed sampling Sampling plan and proceed Place of sampling: Baltijos Date, time of sampling: 02 In samples were received: "BIOR" foor ate (i) of performance of tests: 25.07.	g (according to the order for te g: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra .03.2016 d and environmental Investigation laborator 2016	015 m. planas, y (07.03.2016) Dete	(s) of beginning of tests The limit of	< 08.03.2016	Pesticides	Hexachlorobenzen Hexachlorobenzen Isoproturon Pentachlorobenzen Simazine Triffuralin Dicofol Quinoxyfen Aclonifen
nformation about sampling Person performed samplin Sampling plan and procedu Place of sampling: Baltijos Date, time of sampling: 02	g (according to the order for te gr. Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra .03.2016 d and environmental investigation laborator	015 m. planas,	(s) of beginning of tests The limit of quantification,		Pestiddes	Hexachlorobenzen Hexachlorobutzeit Isoproturon Pentachlorobenzer Simazine Trifluralin Dicofol Quinoxyfen Aclonifen Bifenox
Normation about sampling Person performed sampling Sampling plan and proceed Place of sampling: Baltijos Date, time of sampling: 02 In samples were received: "BIOR" foor ate (i) of performance of tests: 25.07.	g (according to the order for te g: Liudmila Kondratjeva ure: Baltijos jūros monitoringo 2 jūra .03.2016 d and environmental Investigation laborator 2016	015 m. planas, y (07.03.2016) Dete	(s) of beginning of tests The limit of	< 08.03.2016	Pesticides	Hexachlorobenzen Hexachlorobenzen Isoproturon Pentachlorobenzer Simazine Trifturalin Dicofol Quinoxyfen Aclonifen Bifenox Cybutryne
Normation about sampling Person performed sampling Sampling plan and proceed Place of sampling: Baltijos Date, time of sampling: 02 In samples were received: "BIOR" foor ate (i) of performance of tests: 25.07.	E (according to the order for te gr. Ludmä Rodoratjeva ure: Baltijos järos monitoringo 2 jära 0.03.2016 d and sentenenstal investigation isborator 2005 Substances	015 m. planas, y (07.03.2016) Dete	(i) of beginning of tests The limit of quantification, µg/L <sup>8</sup>	с 06.03.2016 Result, µg/L <sup>a</sup>	Pestides	Hexachlorobenzen Hexachlorobutzdie Hexachlorobutzdie Isoproturon Pentachlorobenzer Simazine Trifluralin Dicofol Quinoxyfen Aclonifen Bifenox Cybutryne Total-ypermethrin
Normation about sampling Person performed sampling Sampling plan and proceed Place of sampling: Baltijos Date, time of sampling: 02 In samples were received: "BIOR" foor ate (i) of performance of tests: 25.07.	g (according to the order for te gr: Ludmits Acordratieva ure: Battijos järos monitoringo 2 jära 303.2016 d and andromental Investigation laborator 2016 Substances Naphthaliene	015 m. planas, y (07.03.2016) Dete	(i) of beginning of tests The limit of quantification, µg/L <sup>4</sup> 0.1	c 06.03.2016 Result, μg/L <sup>a</sup> <0.1	Pestides	Hesachlorobenzen Hesachlorobutzelf Hesachlorobutzelf Isoproturon Pentachlorobenzei Simazine Triffuralin Dicofol Quinoxyfen Acionifen Bifenox Cybutryne Total-cypermethrii Dihlorfosz
Normation about sampling Person performed sampling Sampling plan and proceed Place of sampling: Baltijos Date, time of sampling: 02 In samples were received: "BIOR" foor ate (i) of performance of tests: 25.07.	E (according to the order for te gr Ludmä Rodratjeva ure: Baltijos järos monitoringo 2 jära 103.2016 d and endresmental investigation laborator 2006 Substances Naphthaliene Anthracene	015 m. planas, y (07.03.2016) Dete	(i) of beginning of tests The limit of quantification, μg/L <sup>8</sup> 0.1 0.0025	د 08.03.2016 Result, μg/L <sup>a</sup> < 0.1 <0.0025	Pestides	Herachlorobenzen Herachlorobenzen Herachlorobenzen Isoproturon Pentachlorobenzen Simazine Triffuralin Diofol Quinoxyfen Actonifen Biferox Cybuttyne Total-Sypermethrii Dihlorfos
Iternation about sampling Derson performed samplin Sampling plan and procede Diace of sampling: Battijds Date, time of sampling: 02 te samples wars nucled: "BOR" foce er (i) of performance of tests: 23.07. Group of substances	g (according to the order for te gr: Ludmits Acondratieva ure: Baltijos järos monitoringo 2 jära d and annivamental Investigation laborator 2006 Substances Naphthaliene Anthracene Fluoranthene	015 m. planas, γ (07.03.2016) Date	(i) of beginning of tests The limit of quantification, μg/L <sup>8</sup> 0.0025 0.00189	<ul> <li>08.03.2016</li> <li>Result, µg/L<sup>4</sup></li> <li>&lt; 0.1</li> <li>&lt;0.0025</li> <li>&lt;0.00189</li> </ul>	Pestides	Heazchlorobenzen Heazchlorobenzen Heazchlorobenzen Isoproturon Pentachlorobenzen Simazine Quinoxyfen Acionifen Bifenox Cybotryne Total-cypermethrin Dinkorfos Hepsachlor and he epsache
Information about sampling Person performed sampling Sampling plan and proceeds Place of sampling: Baltijo D Date, time of sampling: 'Dath' food we samples were real-ed. 'Bioth' food is of electromeso of tests: 25.07 Group of substances Polycyclic aromatic	E (according to the order for te gr Ludmä Rodratjeva ure: Baltijos järos monitoringo 2 jära 0.03.2016 d end endremental investigation laborator 2006 Substances Naphthalene Anthracene Fluoranthene Benzo(D/lioranthene	015 m. planas, y (07.03.2016) Date Method BIOR-T-012-	(i) of beginning of tests The limit of quantification, µg/L <sup>1</sup> 0.0025 0.00005 0.00005 0.00005	<ul> <li>06.03.2016</li> <li>Result, µg/L<sup>0</sup></li> <li>&lt; 0.1</li> <li>&lt; 0.0025</li> <li>&lt; 0.00005</li> <li>&lt; 0.00005</li> </ul>	(b) - Reputs for all compounds, excu	Heachlorobenzen Heachlorobuten Heachlorobuten Iseptoturen Pentachlorobuten Tinfluralin Diodfol Quinoxyfen Actonifen Biferox Cybutryne Totalcypermethrin Dihlorfos Heptachlor and he eposide Terbutryn
Information about sampling Person performed sampling Sampling plan and proceeds Place of sampling: Baltijo D Date, time of sampling: 'Dath' food we samples were real-ed. 'Bioth' food is of electromeso of tests: 25.07 Group of substances Polycyclic aromatic	g (according to the order for te gr: Liudmik according to ure: Baltijos järos monitoringo 2 jära and andromental Investigation Information 2006 Substances Naphthaliene Anthracene Fluoranthene Benzo(b)/fluoranthene	015 m. planas, y (07.03.2016) Date Method BIOR-T-012-	(c) of beginning of tests The limit of quantification, <u>µg/L<sup>4</sup></u> 0.0025 0.00005 0.00005	06.03.3016 Result, µg/L <sup>k</sup> <0.01 <0.0025 <0.00005 <0.00005	(p) - Rejuts for all compounds, excl. (p) - Rejuts are given as uppersours	Hesschlorobenzen Hesschlorobzate Hesschlorobzate Isoproturon Pentschlorobenzen Simasine Triffuralin Dicofol Guinoxyfen Aclonifen Billenox Cybutyne Dibherfas Heptschlor and he gentior and
Information about sampling Person performed sampling Sampling plan and proceeds Place of sampling: Baltijo D Date, time of sampling: 'Date is samples were real-ed. 'Bioth' food is of deriferments of test: '25.07 Group of substances Polycyclic aromatic	g (according to the order for te gr: Ludmils Acondratieva ure: Batiljos järos monitoringo 2 jära 203.2016 d and andreamental investigation laborator 2006 Substances Naghshalene Andracene Pluoranthene Benzo(s)/fluoranthene Benzo(s)/greene	015 m. planas, y (07.03.2016) Date Method BIOR-T-012-	(i) of beginning of tests The limit of quantification, µg/L <sup>1</sup> 0.0025 0.00005 0.00005 0.00005	<ul> <li>06.03.2016</li> <li>Result, µg/L<sup>0</sup></li> <li>&lt; 0.1</li> <li>&lt; 0.0025</li> <li>&lt; 0.00005</li> <li>&lt; 0.00005</li> </ul>	<ul> <li>Meaning for all compounds, encluding the second seco</li></ul>	Heachlorobensen Heachlorobstein Heachlorobstein Isoproturon Pentachlorobstein Triffuralin Dicofol Quirooyfen Acionifen Bifenos Cybutryne Total-cypermethin Dihlorfos Heptachlor and he apositio Terbutryn dige FCD/F1, 0-PCB is d congerer concentratio
Information about sampling Person performed sampling Sampling plan and proceeds Place of sampling: Baltijo D Date, time of sampling: 'Date is samples were real-ed. 'Bioth' food is of deriferments of test: '25.07 Group of substances Polycyclic aromatic	g (according to the order for te ge: Ludmits Acondratieva ure: Baltijos järos monitoringo 2 jära 103.2016 Substances Substances Naphthalene Anthrusene Fluoranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene Benack/Moranthene	y (07.01.2016) Date Method BIOR-T-012- 162-2015	(i) of beginning of tests The limit of quantification, yg/L <sup>8</sup> 0.00189 0.00005 0.00005 0.00005 0.00005	0E.03.2016 Result, µg/L <sup>8</sup> <0.01 <0.0025 <0.00005 <0.00005 <0.00005 <0.00005	<ul> <li>Insults for all compounds, exclusion</li> <li>Desire Tesults are given as upperbound</li> <li>Desire Tesults are operated as WHO given and the operation of a solution of the operation of a solution of the operation of a solution</li> </ul>	Hasachlorobnate Hesachlorobtadie Hesachlorobtadie Isopreturen Pentschlorobener Simaine Triflurain Dicefol Quinonyfen Actonien Bifenos Cybutyne Tetal-cypemethrin Dinkefos Hespachlor and he Hespachlor and he Tetal-cypemethrin Dinkefos Hespachlor and hespachlor Tetal-cypemethrin Dinkefos Hespachlor and hespachlor Tetal-cypemethrin Dinkefos Hespachlor
Information about sampling Derson performed samplin Sampling plan and proceed Dates of sampling: Battijdo Date, time of sampling: 02 te angles warn nucled: "Bolt" foo ere (1) of performance of tests: 25.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs)	g (according to the order for te gr (Ladoma Kondratjeva urre: Baltijos jūros monitoringo 2 jūra 0.0.2.016 d and antivenmental investigation laborator 2016 Substances Naphthalene Anthracene Physicanthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene Benzo(2)/fluoranthene	(07.01.3016) Date (07.01.3016) Date Method BIOR-T-012- 162-2015 BIOR-T-	(c) of beginning of tests The limit of quantification, µg/L <sup>A</sup> 0.0025 0.00005 0.00005 0.00005 0.00005 0.00005	06.03.2016 Result, µg/L <sup>6</sup> <0.01 <0.0025 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005	<ul> <li>[0] - Result for all compounds, excl.</li> <li>Results are given as upperbounds.</li> <li>Exclust are given as upperbounds.</li> </ul>	Hesschlorobenzen Hesschlorobzate Haszchlorobzate Isoproturon Pentschlorobenzen Simasine Trifluralin Dicofol Quinoxyfen Actonifen Bifenon Cybutyne Diharfoss Hepschlor and he opolice Lerbutyne Lerbutyne der CRO/F, SU-KEs s doncentralin et concentralin of concentralin et concentralin of concentralin of concentralin of concentralin of concentralin of concentralin of concentralin of concentralin of concentralin of concentralin
Idermation about sampling Derson performed samplin Sampling plan and proceed Diace of sampling: Baltijos Date, time of sampling: 02 In amples were resched. "BOR" foor at all of performance of tests: 20.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs) Persistent organic	g (according to the order for te gr: Ludmils Kondratjeva ure: Baltijos järos monitoringo 2 jära 203.2016 d and andreamental investigation laborator 2006 Substances Naghshalene Andracene Pluoranthene Benac(s)/fluoranthene	y (07.01.2016) Date (07.01.2016) Date (07.01.201	(c) of beginning of tests The limit of quantification, <u>up</u> /t <sup>4</sup> 0.0 0.00005 0.00005 0.00005 0.00005 0.00005 0.00005	06.03.3016 Result, µg/L <sup>6</sup> <0.01 <0.00159 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005	<ul> <li>Insults for all compounds, exclusion</li> <li>Desire Tesults are given as upperbound</li> <li>Desire Tesults are operated as WHO given and the operation of a solution of the operation of a solution of the operation of a solution</li> </ul>	Hesschlorobensen Hesschlorobstate Hesschlorobstate Isoproturen Pentschlorobense Simasine Triffuralin Dicofol Quinoxyfen Actonifen Bifenos Cybotryne Total-cypermethvi Dihlorfoss Hepschlor and he sposide Iterbutryn Total-cypermethvi Dihlorfoss Hepschlor and he sposide Iterbutryn diag rEOD/F.0-K16s a concentration of concentration of the occurrent store occurrent store of the occurrent store occurrent store of the occurrent store of the occurrent store occurrent store occurren
Information about sampling Derson performed samplin Sampling plan and proceed Dates of sampling: Battijdo Date, time of sampling: 02 te angles warn nucled: "Bolt" foo ere (1) of performance of tests: 25.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs)	g (according to the order for te gr: Liudmik acondratieva ure: Baltijos järos monitoringo 2 jära d and andromental Investigation Information 2006 Substances Naphthalene Anthracene Fluoranthene Benaci(Njuranthene) Benaci(Njurant	(07.01.3016) Date (07.01.3016) Date Method BIOR-T-012- 162-2015 BIOR-T-	10 of legening of tests The limit of usunsfication 0,0005 0,0005 0,0005	0E.03.2015      Result, µg/L <sup>6</sup> <0.1	<ul> <li>[0] - Result for all compounds, excl.</li> <li>Results are given as upperbounds.</li> <li>Exclust are given as upperbounds.</li> </ul>	Hesschlorobenzen Hesschlorobenzen Hesschlorobenzen Hesschlorobenzen Simszine Triffuralin Dicofol Quinosyfen Acionifen Bifenon Cybutyne Tetalcopermethrir Dinkorfoss Cybutyne Tetalcopermethrir Dinkorfoss Cybutyne Tetalcopermethrir Dinkorfoss Cybutyne Tetalcopermethrir Dinkorfoss Cybutyne Tetalcopermethrir Colorectos Cybutyne Tetalcopermethrir Colorectos Cybutyne Tetalcopermethrir Colorectos Cybutyne Tetalcopermethrir Colorectos Cybutyne Tetalcopermethrir Colorectos Concentration Colorectos Concentration Colorectos Concentration Colorectos Colorec
Idermation about sampling Derson performed samplin Sampling plan and proceed Diace of sampling: Baltijos Date, time of sampling: 02 In amples were resched. "BOR" foor at all of performance of tests: 20.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs) Persistent organic	E (according to the order for te ge: Ludmik acondratieva ure: Battijos järos monitoringo 2 jära 1.03.2016 d and anvienmental investigation laborater 2006 d and anvienmental investigation laborater 2006 d and anvienmental investigation laborater 2006 Substances Naphthalene Anvihacene Hanzachhene Benzo(Shilavanthene Benzo(Shil	y (07.01.2016) Date (07.01.2016) Date (07.01.201	(c) of baginning of tests The limit of quantification, µg/1 <sup>8</sup> 0.11 0.0025 0.00005 0.0005	06.03.2016 Result, µg/L <sup>0</sup> <0.0215 <0.00055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.	<ul> <li>(a) - Results for all compounds, exclusions and the second area given as superclasses</li> <li>(b) - Results are given as superclasses</li> <li>(c) - Results are porticated as the surget, for a superclasses</li> <li>(c) - Results are porticated as the sum of a given as the surget, for a superclasses</li> <li>(c) - Results are provided as a sum of a given as the superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the surget as a superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the surget as a superclasses</li> </ul>	Hearschlorobenzen Hearschlorobenzen Hearschlorobenzen Hearschlorobenzen Simszine Triffuralin Dicofol Quinosyfen Actoniten Bifenon Cybuturne Totalscypermethrir Dihorfos Dihorfos Dihorfos Dihorfos di conserten di conserten al congere concentio al congere concentio al concentration of energy di concentration of energy concentrations of heptad
Idermation about sampling Derson performed samplin Sampling plan and proceed Diace of sampling: Baltijos Date, time of sampling: 02 In amples were resched. "BOR" foor at all of performance of tests: 20.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs) Persistent organic	E (according to the order for te ge: Ludmik acondratieva ure: Battijos järos monitoringo 2 jära 1.03.2016 d and anvienmental investigation laborater 2006 d and anvienmental investigation laborater 2006 d and anvienmental investigation laborater 2006 Substances Naphthalene Anvihacene Hanzachhene Benzo(Shilavanthene Benzo(Shil	y (07.01.2016) Date (07.01.2016) Date (07.01.201	10 of legening of tests The limit of usunsfication 0,0005 0,0005 0,0005	0E.03.2015      Result, µg/L <sup>6</sup> <0.1	b) - Results for all compounds, exclu 21 - Results are given bu upprotocols 21 - Results are spreaded as to wrong 21 - Results are supressed as to wrong 21 - Infoldition is supressed as as sum of a 25 - Result is expressed as as um of a 26 - Baruit are supressed as as um of a 26 - Structure of the supressed as as um of a 26 - Structure of the supressed as as an are 26 - Result is expressed as as um of a 26 - Result is expressed as as um of a 26 - Result is expressed as as a sum of a 26 - Result is expressed as as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 26 - Result is expressed as a sum of a 27 - Result is expressed as a sum of a 28 - Result is expresse	Herachiorobanasen Herachiorobanasen Herachiorobanasen Herachiorobanasen Simazine Trifluralin Dicofol Quinoxyfen Actonifen Bilfenox Cybotryne Total-cypermethrin Dihoffos Heraca Heracahior and herapolitic di congerer concertation al congerer concertation di concentration of concentrations of erapolitica science al a sum of concent concentrations of erapolitica di concentrations of erapolitica di concentrations of erapolitica di concentration of concent concentrations of concent concentrations of concentrations of erapolitica di concentrations of erapolitica di concentrations of concent concentrations of concentrations of erapolitica di concentrations of trabalactica di concentrat
Idermation about sampling Derson performed samplin Sampling plan and proceed Diace of sampling: Baltijos Date, time of sampling: 02 In amples were resched. "BOR" foor at all of performance of tests: 20.07. Group of substances Polycyclic aromatic hydrocarbons (PAHs) Persistent organic	g (according to the order for te gr: Liudmik acondratieva ure: Baltijos järos monitoringo 2 jära d and andromental Investigation Information 2006 Substances Naphthalene Anthracene Fluoranthene Benaci(Njuranthene) Benaci(Njurant	y (07.01.2016) Date (07.01.2016) Date (07.01.201	(c) of baginning of tests The limit of quantification, µg/1 <sup>8</sup> 0.11 0.0025 0.00005 0.0005	06.03.2016 Result, µg/L <sup>0</sup> <0.0215 <0.00055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.000055 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.	<ul> <li>(a) - Results for all compounds, exclusions and the second area given as superclasses</li> <li>(b) - Results are given as superclasses</li> <li>(c) - Results are porticated as the surget, for a superclasses</li> <li>(c) - Results are porticated as the sum of a given as the surget, for a superclasses</li> <li>(c) - Results are provided as a sum of a given as the superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the surget as a superclasses</li> <li>(c) - Results are provided as a sum of a given as the surget as a sum of a given as the surget as a superclasses</li> </ul>	Herachiorobanasen Herachiorobanasen Herachiorobanasen Herachiorobanasen Simazine Trifluralin Dicofol Quinoxyfen Actonifen Bilfenox Cybotryne Total-cypermethrin Dihoffos Heraca Heracahior and herapolitic di congerer concertation al congerer concertation di concentration of concentrations of erapolitica science al a sum of concent concentrations of erapolitica di concentrations of erapolitica di concentrations of erapolitica di concentration of concent concentrations of concent concentrations of concentrations of erapolitica di concentrations of erapolitica di concentrations of concent concentrations of concentrations of erapolitica di concentrations of trabalactica di concentrat

	a-HBCD		0.00008	<0.00008	13	ANNEX   OF THE 1	1
clododecane	6-HBCD	BIOR-T-	0.00005	<0.00008	13	№ PV-2016-P-	1
ciococecane	y-HBCD	012-162-	0.00008	<0.00008	17	1210-2010-1-	1
	Total-HBCD	2015	0.00024	<0.00024	15	Concentrations of individual congeners of PCDE	۱.
5	Chlorolkanes (C10-C13)	BIOR-T-012- 162-2015	0.00024	<0.12	20	PCDD/	
						Congener	÷
ine sulfonic	PFOS	BIOR-T-012- 165-2015	0.000039	0.0003	20	2,3,7,8-TCDF	
erivatives	PFOA	165-2015	0.000039	0.0015	20	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF	-
	Nonyphenol (4-nonylphenol)		0.09	0.189	25	1,2,3,4,7,8-HxCDF	-
	Octylphenol ((4- (1,1 ', 3,3'-tetrametilbutil) -phenol))	BIOR-T-012-	0.003	0.043	25	1,2,3,6,7,8+HxCDF 2,3,4,6,7,8+HxCDF	1
	Pentachlorophenol	165-2015	0.003	<0.003	20	1,2,3,7,8,9-HxCDF	-
	Tributyltin cation	BIOR-T-012-	0.00006	<0.00006	15	1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF	-
	-	164-2015				OCDF	
	Alachior		0.09	< 0.09	50	2,3,7,8-TCDD 1,2,3,7,8-PeCDD	_
	Atrazine		0.18	< 0.18	50	1,2,3,7,8-PECDD 1,2,3,4,7,8-HxCDD	-
	Chlorfenvinphos	1	0.03	< 0.03	50	1,2,3,4,7,8-H%CDD	-
	Chlorpyrifos(chorpyrifos-	1				1.2.3.7.8.9-HxCDD	-
	ethyl)		0.009	< 0.009	50	1.2.3.4.6.7.8-HpCDD	-
	Aldrin	1	0.0015	< 0.0015	50	OCDD	1
	Dieldrin	1	0.0015	< 0.0015	50	WHO(2005)-PCDD/F-TEQ lowerbound	
		-			50	WHO(2003)-PCDD/F-TEQ upperbound	
	Endrin	4	0.0015	< 0.0015		DL-PCB	6
			0.0015	< 0.0015	50	Congener	_
	Total-DDT		0.003	<0.003	50	2',3,4,4',5-PentaHB (#123)	_
	p-p-DDT		0.003	<0.003	50	2,3',4,4',5-PentaHB (#118) 2,3,4,4',5-PentaHB (#114)	_
	Diuron		0.06	< 0.06	50	2,3,4,4',5-PentaHB (#114) 2,3,3,'4,4'-PentaHB (#105)	-
	Endosulfan <sup>(*)</sup>		0.0015	< 0.0015	50	2.3'.4.4'.5.5' HexaHB (#167)	-
	Hexachlorobenzene	1	0.015	< 0.015	50	2.3.3',4.4',5-HexaH8 (#156)	-
	Hexachlorobutadiene	BIOR-T-012-	0.18	< 0.18	50	2,3,3',4,4',5'-HexaH8 (#157)	7
	Hexachlorocyclohexane [7]	162-2015	0.0006	< 0.0006	50	2,3,3',4,4',5,5'-HeptaHB (#189)	
	Isoproturon	-	0.09		50	3,4,4',5-TetraHB (#81)	
				< 0.09		3,3,'4,4'-TetraHB (#77)	_
	Pentachlorobenzene		0.00021	< 0.00021	50	3,3',4,4',5-PentaHB (#126) 3,3',4,4',5,5'-HexaHB (#169)	_
	Simazine		0.3	< 0.3	50	3,3',4,4',3,5'-HexaHB (#169) WHO(2005)-PCB-TEQ lowerbound	-
	Trifluralin		0.009	< 0.009	50	WHO(2005)-PCB-TEQ upperbound	-
	Dicofol	1	0.0000096	< 0.0000096	50	WHO(2005)-PCDD/F-PCB-TEQ lowerbound	-
	Quinoxyfen	1	0.0045	< 0.0045	50	WHO(2003)-PCDD/F-PCB-TEQ upperbound	7
	Aclonifen	1	0.0036	< 0.0036	50	PBDEs	ī
	Bifenox	1	0.00036	< 0.00036	50	Congener	7
	Cybutryne	1	0.00075	< 0.00075	50	2,4,4*TriBDE (#28)	1
	Total-cypermethrin	1	0.0000024	< 0.0000024	50	2,2',4,4'-TetraBDE (#47)	
	Dihlorfoss	1	0.000018	< 0.000018	50	2,2',4,4',5-PentaBDE (#99)	_
		-	0.000015	< 0.000018	30	2,2',4,4',6-PentaBDE (#100)	_
	Heptachlor and heptachlor		0.00000003	< 0.00000003	50	2,2',4,4',5,5'-HexaBDE (#153)	_
	epoxide		0.00195	< 0.00195	50	2,2',4,4',5,6'-HexaBDE (#154) 5PBDE upperbound	-
and and and a	Terbutryn ng PCDD/Fs, DL-PCBs and PBDEs are	alization in such the				5PBDE lowerbound	-
as upperbound of tion of individual ssed as WHO <sub>2005</sub>		ple is provided in	Annex I of the curre	nt report		< : Concentration below the identified limit of quantification (LOQ)	
exane is express	ed as a sum of concentrations of HC	H-alpha, HCH-be	a and HCH gamma. L	OQs for individual co	mpounds are 0.000	Lowerbound : Value calculated by including the quantified congeners only	

hlor and heptachlor epoxide. LOQs for individual compounds are 0.0000000015 µg/L

 Not included in scope of accreditat
 Included in flexible scope of accreditat Test report Na PV-2016-P-17301.01. Test results relate only to the items tested. Test report should not be reproduced except in full without written approval of "BiOR" Test report should not be reproduced without a reference to "BiOR".

Upperbound : Value calculated by including the non-quantified congeners by taking the full value of their LOQ

ND : Not determined since none of the corresponding congeners was above the LOQ

Page 3 of 3 \* Not included in scope of accreditation of LATAK ~ Included in flexible scope of accreditation of LATAK

#### ANNEX I OF THE TEST REPORT Nº PV-2016-P-17301.01

Concentrations of individual congeners of PCDD/F, DL-PCB and PBDE in the tested sample

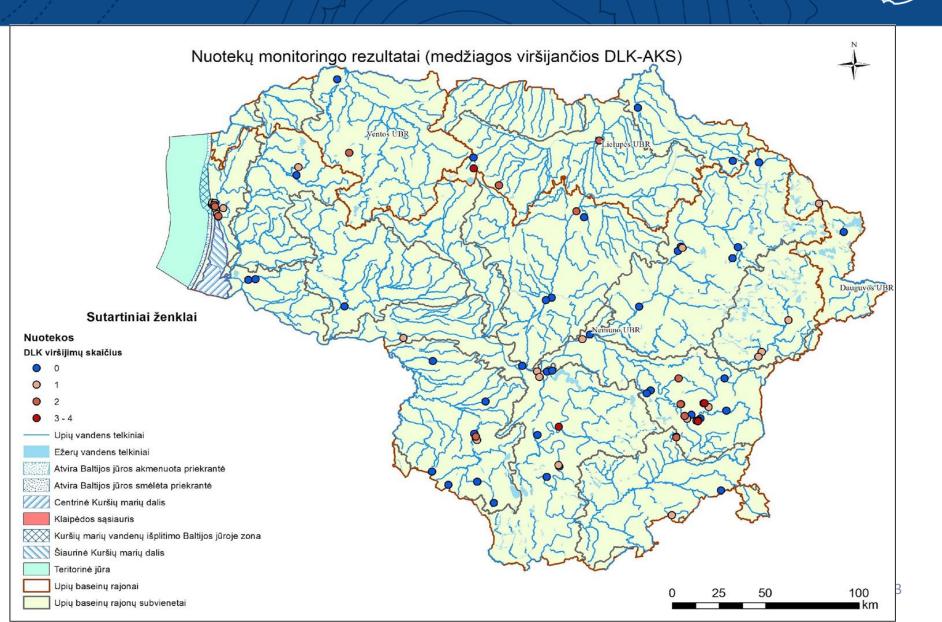
PCDD/F		
Congener	pg/L	
2,3,7,8-TCDF	<0.14	
1,2,3,7,8-PeCDF	<0.14	
2,3,4,7,8-PeCDF	<0.15	
1,2,3,4,7,8-HxCDF	<0.13	
1,2,3,6,7,8-HxCDF	<0.11	
2,3,4,6,7,8-HxCDF	<0.13	
1,2,3,7,8,9-HxCDF	<0.14	
1,2,3,4,6,7,8-HpCDF	<0.16	
1,2,3,4,7,8,9-HpCDF	<0.25	
OCDF	<0.49	
2,3,7,8-TCDD	<0.23	
1,2,3,7,8-PeCDD	<0.24	
1,2,3,4,7,8-HxCDD	<0.21	
1,2,3,6,7,8-HxCDD	<0.21	
1,2,3,7,8,9-HxCDD	<0.20	
1,2,3,4,6,7,8-HpCDD	<0.25	
OCDD	<0.44	
WHO(2003)-PCDD/F-TEQ lowerbound		
WHO(2003)-PCDD/F-TEQ upperbound		0.6
DL-PCBs		
Congener	pg/L	
2',3,4,4',5-PentaHB (#123)		
2,3',4,4',5-PentaHB (#118)		2
2,3,4,4',5-PentaHB (#114)		
2,3,3,'4,4'-PentaHB (#105)		1
2,3',4,4',5,5'-HexaHB (#167)	<0.38	
2,3,3',4,4',5 HexaHB (#156)	<0.44	
2,3,3',4,4',5'-HexaHB (#157)	<0.44	
2,3,3',4,4',5,5'-HeptaHB (#189)	<0.38	
3,4,4',5-TetraHB (#81)	<0.75	
3,3,'4,4'-TetraHB (#77)	<0.81	
3,3',4,4',5-PentaHB (#126)	<0.94	
3,3',4,4',5,5'-HexaH8 (#169)	<0.81	
WHO(2005)-PCB-TEQ lowerbound		0.0
WHO(2003)-PCB-TEQ upperbound		0.:
WHO(2005)-PCDD/F-PCB-TEQ lowerbound		0.0
WHO(2005)-PCDD/F-PCB-TEQ upperbound		0.3
PBDEs		
Congener	pg/L	
2,4,4'-TriBDE (#28)	<4.56	
2,2',4,4'-TetraBDE (#47)	<4.44	
2,2',4,4',5-PentaBDE (#99)	(5.36	
2,2',4,4',6-PentaBDE (#100)	<5.06	
2,2',4,4',5,3'-HexaBDE (#153)	<4.00	
2,2',4,4',5,6'-HexaBDE (#154)	<3.31	
SPBDE upperbound		2

## Some numbers...



Aplinkos terpė	Mėginių skaičius					
Balt	tijos jūroje					
Vanduo	45					
Dugno nuosėdos	16					
Biota	16					
Kurš	śių mariose					
Vanduo	36					
Dugno nuosėdos	12					
Biota	3					
Upėse ir	Kauno mariose					
Vanduo	94					
Dugno nuosėdos	24					
Biota	12					
Stebėsenos	sąrašo medžiagos					
Vanduo	12					
Ūkio suk	ojektų poveikio					
Nuotekos	<sup>163</sup> 49 130					
Nuotekų dumblas	28 0					
Paviršinso vanduo	87 rezultatai					
Dugno nuosėdos	48					
lš viso	592					

### WASTEWATER QUALITY



# Limitations during screening of priority substances

- Lack of AA and MAC EQS limit values for all pollutants, especially for such matrixes as sewage sludge and sediments;
- Lack of clear AA and MAC EQS limit values resulted in **potential misestimations**, thus making some pollutants (i.e. PFOS and Dioxins) seeming to be found in high concentrations everywhere;
- For industries, represented with only one enterprise, it was impossible to identify «typical pollutants»;
- There were couple of precedents, when economic activity classification (NACE Rev. 2) for certain enterprise was confusing and did not correctly represent its polluting activity (i.e., «real estate activity» – NACE Rev. 2 code 68).

# Priority substances, typical for waste water of certain industries (1)

Industry (by NACE Rev. 2 classification)	Priority substances
11 – Manufacture of beverages	9b – DDT; 15 – Fluoranthene; 24 – Nonylphenols; 28 – PAH; 37 – Dioxins
13 – Manufacture of textiles	6 – Cd; 9b – DDT; 12 – DEHP; 15 – Fluoranthene; 20 – Pb; 24 – Nonylphenols; 25 – Octylphenols; 28 – PAH; 30 – Tributyltin cation; 35 – PFOS; 37 – Dioxins
17 – Manufacture of paper and paper products	<b>6 – Cd</b> ; <b>15 – Fluoranthene</b> ; 23 – Ni; 28 – PAH; 35 – PFOS; <b>37 – Dioxins</b>
20 – Manufacture of chemicals and chemical products	12 – DEHP; 15 – Fluoranthene; 28 – PAH; 35 – PFOS; 37 – Dioxins
22 – Manufacture of rubber and plastic products	6 – Cd; 15 – Fluoranthene; 20 – Pb; 23 – Ni; <b>24 – Nonylphenols</b> ; <b>25 –</b> <b>Octylphenols</b> ; 28 – PAH; <b>35 – PFOS</b> ; <b>37 – Dioxins</b>
23 – Manufacture of other non- metallic mineral products	6 – Cd; <b>12 – DEHP</b> ; 15 – Fluoranthene; <b>24 – Nonylphenols</b> ; 28 – PAH; 35 – PFOS; 37 – Dioxins

## Priority substances, typical for waste water of certain industries (III)



Industry (by NACE Rev. 2 classification)	Priority substances
28 – Manufacture of machinery and equipment	<b>15 – Fluoranthene</b> ; 35 – PFOS; 37 – Dioxins
33.15 – Repair and maintenance of ships and boats	6 – Cd; 9b – DDT; 15 – Fluoranthene; 20 – Pb; 28 – PAH; <b>30 –</b> <b>Tributyltin cation</b> ; 35 – PFOS; 37 – Dioxins
35 – Electricity, gas, steam and air conditioning supply	6 – Cd; <b>9b</b> – <b>DDT</b> ; 15 – Fluoranthene; <b>20</b> – <b>Pb</b> ; 23 – Ni; <b>24</b> – <b>Nonylphenols</b> ; <b>28</b> – <b>PAH</b> ; 30 – Tributyltin cation; 35 – PFOS; <b>37</b> – <b>Dioxins</b>
<ul> <li>36 – Water collection, treatment and</li> <li>supply</li> <li>37 – Sewerage</li> </ul>	6 – Cd; <b>9b – DDT</b> ; 11 – Dichloromethane; <b>12 – DEHP</b> ; <b>15 –</b> <b>Fluoranthene</b> ; 20 – Pb; <b>21 – Hg</b> ; 23 – Ni; <b>24 – Nonylphenols</b> ; <b>25 –</b> <b>Octylphenols</b> ; <b>28 – PAH</b> ; <b>30 – Tributyltin cation</b> ; <b>35 – PFOS</b> ; <b>37 –</b> <b>Dioxins</b> ; <b>43 – HBCDD</b>

## Priority substances, typical for waste water of certain industries (III)



Industry (by NACE Rev. 2 classification)	Priority substances
49 – Land transport and transport via pipelines	15 – Fluoranthene; 24 – Nonylphenols; 25 – Octylphenols; 28 – PAH; 35 – PFOS; 37 – Dioxins
52 – Warehousing and and support activities for transportation (i.e. cargo handling in ports)	9b – DDT; 15 – Fluoranthene; 23 – Ni; 24 – Nonylphenols; 25 – Octylphenols; 28 – PAH; 35 – PFOS; 37 – Dioxins
68 – Real estate activities (controversial)	<b>15 – Fluoranthene</b> ; 28 – PAH; 35 – PFOS; 37 – Dioxins

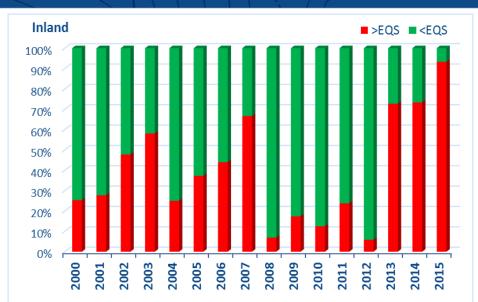
### WATER CHEMICAL QUALITY

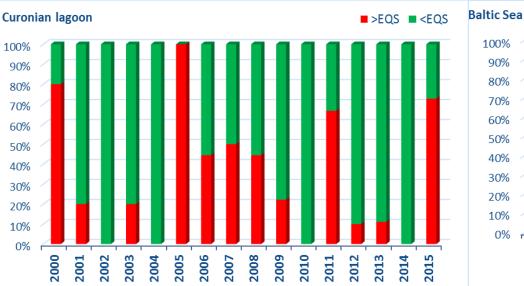


- Monitoring and project results during last 15 years (2000-2015) were evaluated in inland waters, Curonian lagoon and Baltic Sea. Older data were not included into analysis.
- Data analysis was done by monitoring stations and by matrices (water, sediments and biota).
- Trend analysis for each substance was done if concentrations were above LOQ for at least three year period.

### EQS exceedances 2000-2015

 EQS (AA or MAC) exceedances for at least one substance were observed for most of studied years







### Priority substance monitoring in 2015 (rivers and lakes)



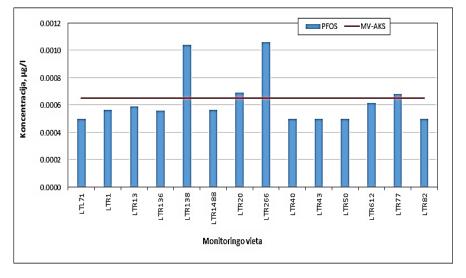
 Surface water monitoring in 2015 was done in following river stations: LTR1, LTR13, LTR136, LTR138\*, LTR1488, LTR127\*, LTR20, LTR266\*, LTR40, LTR43, LTR50, LTR612, LTR77, LTR82, and in one lake station: LTL71 (Kauno marios).

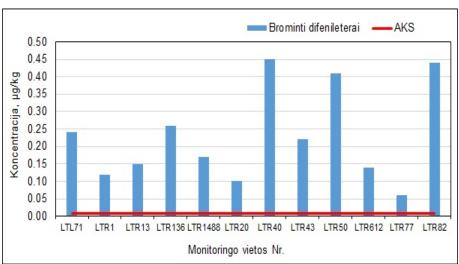
\*Samples were analyzed only in Lithuania

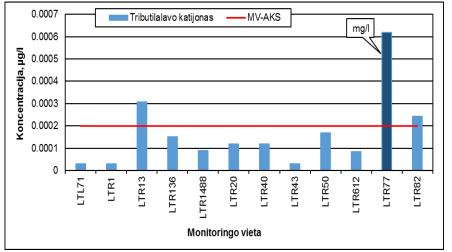
- AA-EQS exceedances in surface water were found for several substances: Pb, Ni, PFOS, cybutrine, DEHP, benzo(b)fluoranthene, tributyltin.
- MAC-EQS exceedances were observed for: Pb, Hg, cybutrine, benzo(g,h,i)perylene, tributyltin.
- BDE exceeded biota EQS in all samples and was in range from 0,06 μg/kg (LTR77) to 0,45 μg/kg(LTR40). Hg exceeded biota EQS from 1,2 to 5,7 times in all surveyed monitoring stations, except LTR40, LTR43 and LTR50.

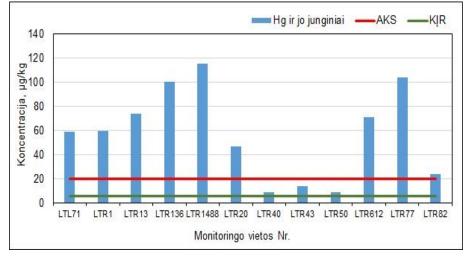


#### **Surface water**









#### **Biota**

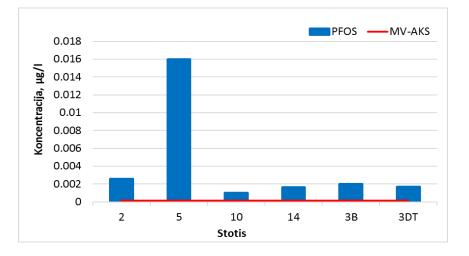
### Priority substance monitoring in 2015 (Curonian lagoon)

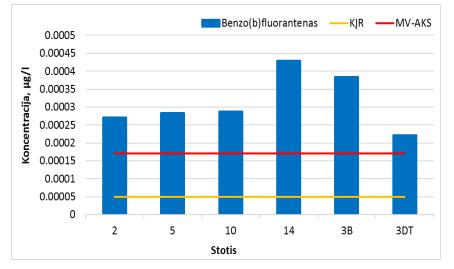


- Surface water monitoring in 2015 was done in fallowing stations: Nr 1, 2, 3, 5, 6, 10, 12, 14, 3A, 3B, 3DT.
- **AA-EQS** exceedances in <u>surface water</u> were observed for several substances: PFOS, total DDT, DEHP, all PAHs (Nr 28). MAC-EQS was not exceeded for any substance.
- Analysis of EQS exceedances in <u>sediments</u> was possible only for heavy metals (Cd, Pb, Hg, Ni) because these substances have national EQS standards. Cd EQS were exceeded in monitoring stations Nr 3, 3DT and 6. Pb in stations Nr 3, 3B, 3DT and 6. Hg in stations Nr 2, 3B, 3DT, 6. Ni in stations Nr 2, 3, 3B, 5, 6, 12 and 14.
- Priority substances in <u>biota</u> were monitored in monitoring stations Nr 2 and Nr 12. EQS exceedances were observed for BDE (monitoring stations Nr 2 and 12) and Hg (monitoring station Nr 2).

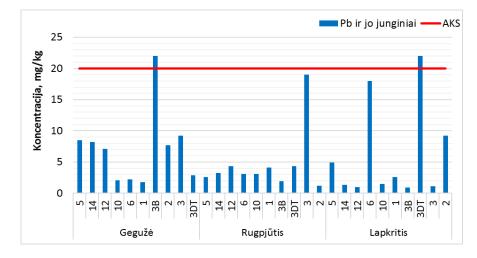


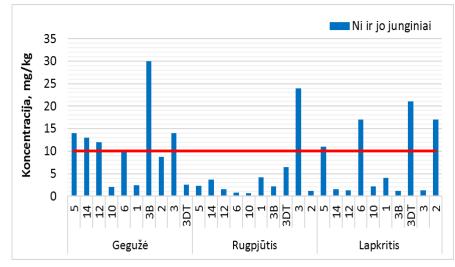
#### **Surface water**





#### **Sediments**





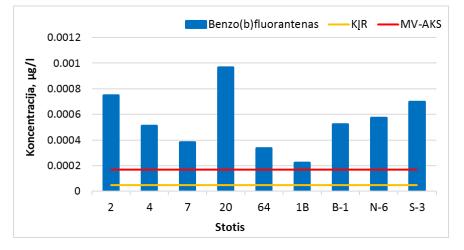
### Priority substance monitoring in 2015 (Baltic Sea)

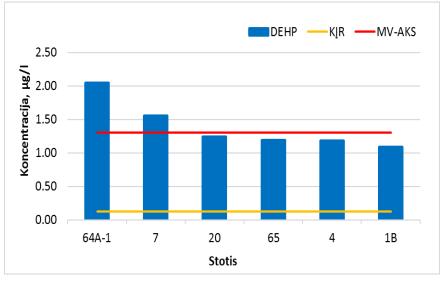


- Surface water monitoring in 2015 was done in fallowing stations: 1, 2, 4, 6, 7, 20, 64, 65, 1B, 64A1, B-1, N-6, S-1 and S-3.
- AA-EQS exceedances in <u>surface water</u> was observed for several substances: PFOS, DEHP, all PAHs. MAC-EQS was exceeded only for benzo(g,h,i)perylene.
- Analysis of EQS exceedances in sediments were possible only for heavy metals (Cd, Pb, Hg, Ni) because these substances have national EQS standards. EQS exceedances in <u>sediments</u> were observed only for Ni in stations Nr 20 ad 20A.
- <u>Biota</u> in Baltic Sea was monitored in several monitoring stations: Nr 2, 7, 1B, 20, 65, 506, 473. BDE exceeded EQS in all surveyed monitored stations. Hg-in all stations except Nr 65 and 473.
- Compared to the Curonian lagoon, concentrations of priority substances in the Baltic Sea are lower.

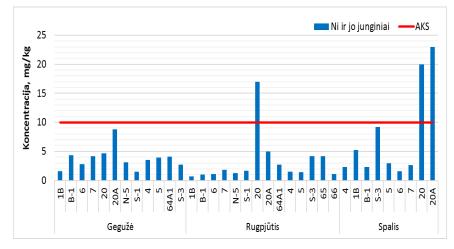


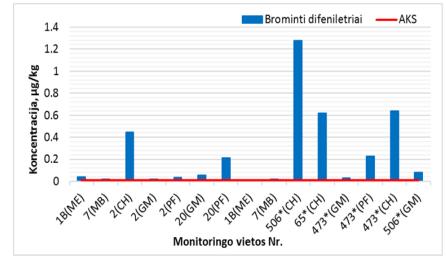
#### Surface water





#### Sediments/ biota





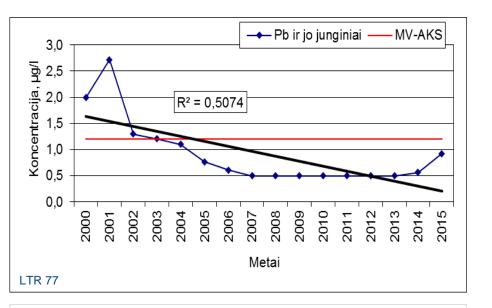
Paveikslas 4.1.3.14. Brominti difenileteriai (medžiaga Nr. 5) biotoje (CH-Clupea harengus, GM-Gadus morhua, MB-Macoma balthica, ME-Mytilus edulis, PF-Platichthys flesus )

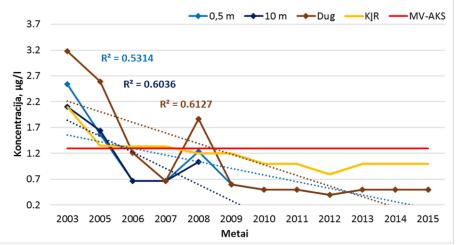
### Long-term trends

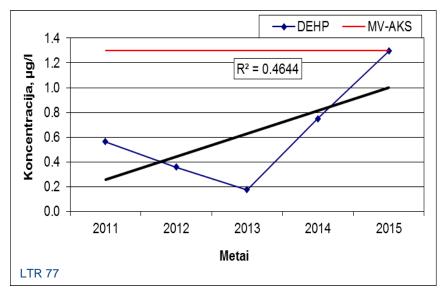


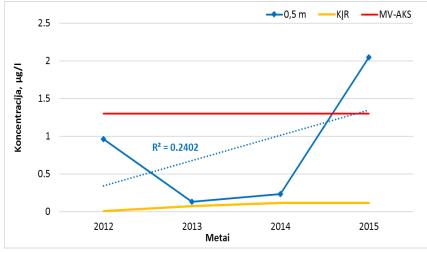
- <u>Inland waters</u>. Overall increasing trends in surface water were observed for substances Nr. 12 and 28, and in sediments for substances Nr. 15 and 28. In total, there is tendency that priority substance concentrations in surface water tend to decrease, but increasing trend can be found for concentrations in sediments.
- <u>Curonian lagoon</u>. Most of substances show strong decreasing trends. Exception is substance Nr. 22 (sediments). Concentrations of heavy metals in sediments and surface water have decreased significantly, especially Hg. In sediments increasing trends for at least one monitoring station were observed for eight substances. Increasing tendency was observed not only for Klaipeda harbor area, but also for several stations belonging to central part of lagoon (stations Nr. 6, 10, 12, 14).
- <u>Baltic Sea</u>. Heavy metal concentrations significant decreasing trend. More than one increasing trend was observed for substances Nr. 12 (surface water) and 15 (sediments). Most of increasing trends were observed for monitoring stations Nr. 20 and 64A1. Heavy metal concentration in sediments show decreasing trends (the only exceptions are Cd and Ni concentrations in monitoring stations Nr. 64A1 and S-3).
- It was not possible to make trend analysis for **PFOS** because monitoring of this substance started only recently. But relatively large number of EQS exceedances indicates that for PFOS additional attention must be in future.





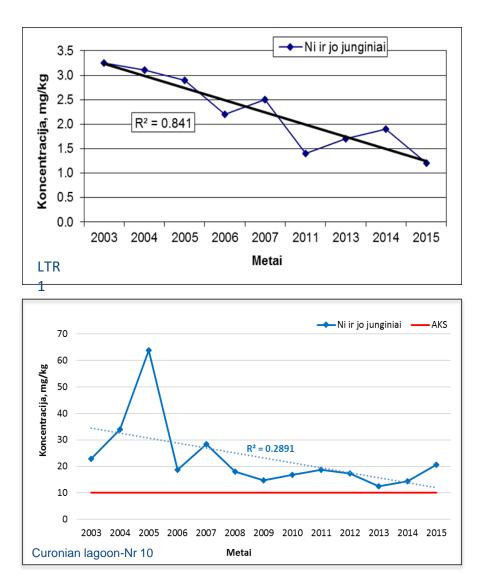


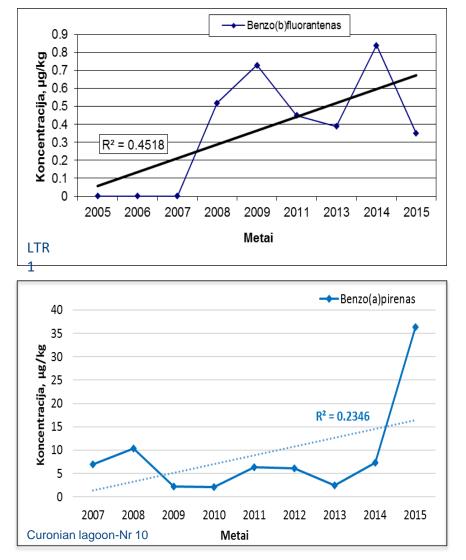




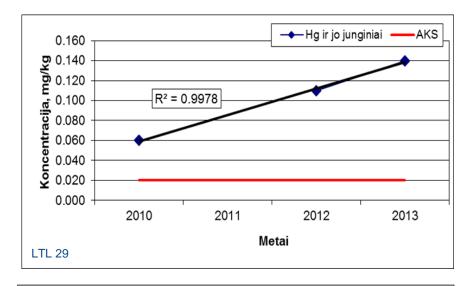
Baltic Sea- Nr 64A-1

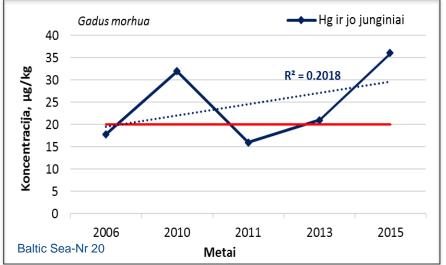
### **Trends in sediments**

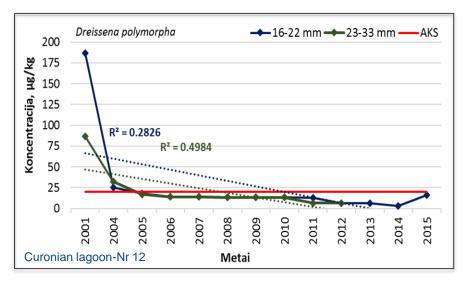


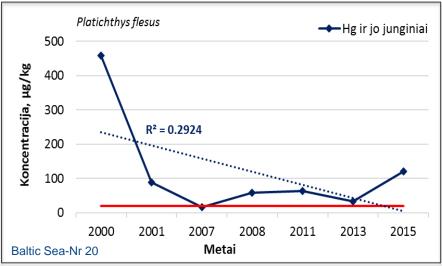


### **Trends in biota**









### **Pollution source analysis**



### Wide spectre of analysed information:

- Statistical data on emissions in water & air (point sources)
- Calculated & modelled results on diffuse pollution (air emissions (EMEP, NFR tables), agricultural activities)
- Long-term trends of monitoring results
- Actual gathered monitoring data (water environment & wastewaters)
- Results from previous implemented projects
- Good practice in priority substances management from Sweden

Most problematic areas	Sectors	Priority substances					
Klaipeda area (Nemunas RBD, Kuršiµ marios)	Point & diffuse source (Industry, transport)	6 (Cd), 15 (fluoranthene), 28 (PAH), 35 (PFOS), 24/25 (phenols)					
Vilnius & Kaunas area ( <i>Nemunas RBD</i> )	Industry & Municipal Diffuse sources	28 (PAH), 30 (TBT), 35 (PFOS), 43 (HBCDD), 15 (fluoranthene), 6 (Cd), 21 (Hg)					
Mažeikiai area ( <i>Venta</i> <i>RBD</i> )	Industry (oil refinery)	28 (PAH), 20 (Pb), 35 (PFOS)					
Kulpė river ( <i>Lielupe</i> <i>RBD</i> )	Industry (leather & fur tanning) Diffuse (agriculture)	23 (Ni) «New generation» pesticides					
Dumping sites & Būtingė oil terminal area ( <i>Baltic Sea</i> )	Industry (harbors, oil refinery)	6 (Cd), 20 (Pb), 23 (Ni), 28 (PAH), 35 (PFOS)					
All territory of Lithuania	Point& diffuse source Historical pollution	12 (DEHP), 35 (PFOS), 28 (PAH) In several areas - 20 (Pb), 23 (Ni), 30 (TBT) 9b (visas DDT)					

### **Programme of Measures**



- Elaborated Programme of Measures for each RBD, as well as for Curonian lagoon and Baltic Sea
- Cost efficiency analysis
- Need for discussion on practical implementation possibilities
- Total costs for Lithuania are:
   3,5 M 9,6 M EUR

MEASURES	RIVER BASIN DISTRICT	SUBSTANCES
Review environmental permits once in a year	All territory	6, 15, 18, 20, 21, 23, 24, 28, 30, 35
Mixing zone calculation	Nemunas RBD	6, 9b, 11, 12, 15, 20, 21, 23, 24, 25, 28, 30, 32, 35, 41, 42, 43
Use of Best available techniques	All territory	2, 6, 12, 15, 20, 23, 24, 28, 30, 35
Public awareness raising	All territory	6, 12, 15, 18, 20, 21, 23, 24, 25, 28, 30, 32, 35, 41, 43
Changes in legislation	Nemunas RBD, Venta RBD, Curonian lagoon, Baltic Sea	6, 30
Investigative monitoring of "new generation" pesticides	Nemunas RBD, Lielupe RBD	From Nr 34 in list
Improved technologies in WWTP (activated carbon/ozonation / electrocoagulation etc.)	All territory	6, 12, 15, 18, 21, 24, 25, 28, 30, 35
Additional monitoring	Daugava RBD	6, 9b, 20, 21, 23, 28, 35
Statistical data on fertilizer and pesticide use	Lielupe RBD	Heavy metals, pesticides
Research projects	Venta RBD	2, 6, 9a, 23, 24, 25

### Monitoring programme optimization

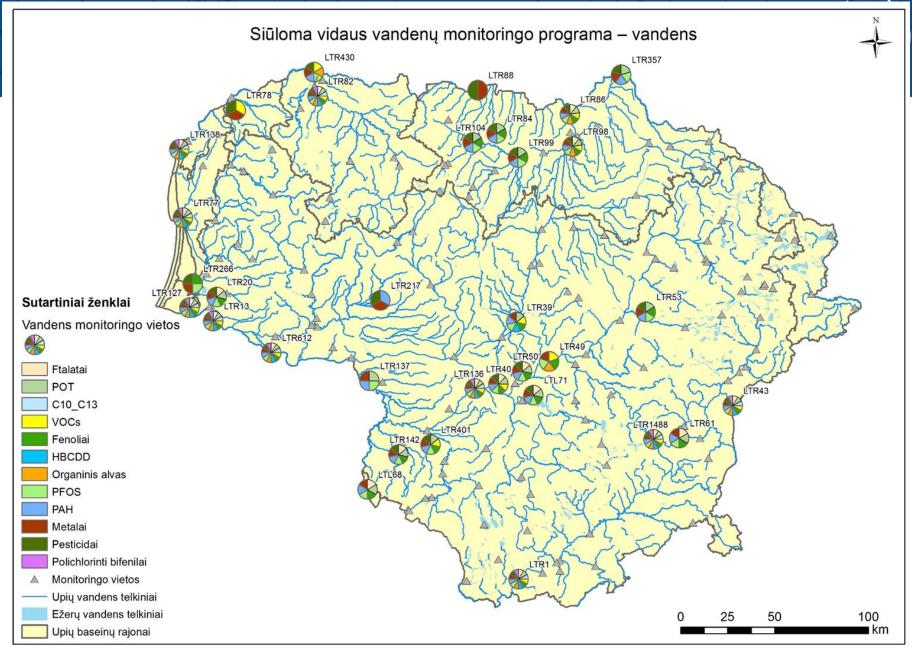


- Surface water monitoring program by water type (Baltic sea, Curonian Lagoon, Rivers and Lakes) and by matrices (water, bottom sediments, biota) were developed.
- For each water type monitoring programmes are available also as MS Excel files.
- Monitoring programmes were developed taking into account monitoring plans developed by the Lithuanian Environment Agency in 2016.

### Surface water monitoring programme



- Main criteria for the selection of stations were high concentrations/EQS exceedances of hazardous substances in a particular station and nearby stations, as well as in the waste water and/or receiving waters. Overall intensity of agricultural and industrial activities or level of urbanization was also taken into account.
- <u>Surface water</u>. We suggest to include 17 additional monitoring stations to existing monitoring network.
- <u>Sediments</u>. Monitoring data available for the analysis came from 118 river and lake monitoring stations. Of these, only 17 river and lake stations have sediment monitoring data after 2010. Overall monitoring design for the 19 river stations and 1 lake station was chosen based on the maximum priority set for each substance.
- <u>Biota</u>. Overall monitoring design for the 12 river stations and one lake station was chosen based on the maximum priority set for each substance. All substances for which biota EQS are established are included in the programme.



### **Curonian lagoon monitoring programme**



- One or two most representative monitoring stations were chosen for each of the three Curonian lagoon parts and where the monitoring frequency should be increased:
  - <u>Stations Nr 2 and 3B (Klaipeda harbor aquatorium)</u>
  - <u>Stations Nr 5 (Northern aquatorium)</u>
  - <u>Stations Nr 10 and 14 (Central part (LT))</u>.
- In comparison to actual Curonian lagoon monitoring plan, we recommend to increase number of monitored priority substances in surface water and decrease number of monitored pesticides in sediments.
- Depending on their occurrence and EQS exceedances, priority substances for surface monitoring were divided into two groups: <u>high priority (heavy metals,</u> <u>fluoranthene, PAH (Nr 28), HCH, DDT, PFOS, DEHP)</u> and low priority (all other) substances.

For sediments high priority substances were also tributyltin, anthracene, naphthalene.

### Baltic Sea monitoring programme

- Taking into account the monitoring time series and frequency of EQS exceedances, following monitoring stations were chosen as the most representative for the sea waters:
  - <u>stations 1B and B-1</u> (northern coastal waters),
  - <u>station No 4 (transitional waters)</u>,
  - <u>station No 7 (southern coastal waters)</u>,
  - <u>station No 20</u> (central part, coastal waters up to 12 nautical miles from the coast)
  - <u>station No 65</u> (open sea).
- Depending on their occurrence and EQS exceedances, priority substances for surface monitoring were divided into two groups: <u>high priority (heavy metals, PAH (No 28), HCH, DEHP)</u> and low priority (all other) substances.

For sediments high priority substances were also total DDT, PFOS.

### GIS database and maps summary



- 3 main geodatabases and 1 additional geodatabase:
  - For work with file geodatabases use Arc Catalog;
  - Main geodatabases consists of 25 feature classes which summarizes all monitoring results;
  - Picture to the right shows the structure of the geodatabases;
  - «LT\_DATA» geodatabase includes all basic data for Lithuania.

3\_LT\_FINAL REPORT 2016-12-23

GEODATABASES
 GEODATABASE
 GEODATABASES
 GEODA

📧 🚞 BIOTA\_INLAND

🗄 🚞 DAUGUVA UBR

1 INLAND 2015

∃ ■ □ LIELUPES UBR

Image: MONITORING\_MAPS

🗄 🚞 BALTIC SEA KURSU MARIO

WASTE\_WATER\_SLUDGE\_SEDIMENTS

🖃 🚞 GIS DATA

E MAPS

- «Maps» folder includes 9 different folders of maps and appropriate .mxd files that represents all results asked to be shown in the maps:
  - In these folders the total
  - amount of maps and .mxd is 77;
  - For each map there is appropriate.mxd file with the same name.

Baltic\_sea\_kursu\_joma\_2000\_2004EQS\_sediments.jpg
Baltic\_sea\_kursu\_joma\_2000\_2004EQS\_sediments.mxd

3\_LT\_FINAL REPORT 2016-12-23 🖃 🚞 GIS DATA GEODATABASES BALTIC SEA KURSU MARIO Baltic\_sea\_Kursu\_joma.gdb Baltic\_sea\_2000\_2015\_sediments 记 Baltic sea 2000 2015 water Baltic\_sea\_2000\_2015\_water\_AA BIOTA BJ\_30\_11\_new BIOTA\_KM\_30\_11\_new Kursu\_joma\_2000\_2015\_sediments 단 Kursu joma 2000 2015 water Kursu\_joma\_2000\_2015\_water\_AA INLAND\_MONITORING Inland monitoring data.gdb AA\_udens\_Lielupe\_new AA\_udens\_Nemuna\_new AA\_ūdens\_Daugava\_new AA\_ūdens\_Venta\_new 😳 Biota inland new MAC\_udens\_Lielupe\_new MAC\_udens\_Nemuna\_new MAC üdens Daugava new MAC ūdens Venta new Sedimenti Daugava new Sedimenti\_Lielupe\_new Sedimenti\_Nemuna\_new Sedimenti\_Venta\_new 🖃 🚞 LT\_DATA 🗉 🧻 New File Geodatabase.gdb WASTE\_WATER\_SLUDGE\_SEDIMENTS Waste\_w\_sediments.gdb All sediments new Surface\_waters\_new Waste\_water\_above\_MPK\_AA\_new Waste water new 🗄 🧰 MAPS

# Use of file geodatabase and feature classes ()

Ta	ble																				□ ×
:	• 🖶 • 🖣	N 🔁 🛛	X jo 2																		
AA	_ūdens_Venta_	new																			×
	OBJECTID *	RBD	Category	River_lake_name	Station	Station_ID	Year_	X	Y	Monitoring	Nr_in_dir	Substance	Unit	AA	AA_EQS	LOQ_value	Difference	Aaexceed	NAME	NAME_LT	EU_ ^
Þ	17	Venta	a Upė	Venta	žemiau Mažeikių	LTR82	2015	390928.5001	6252723.25	BIOR data	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pirenas	mikrg/l	0.000094	0.00017	0.00005	0.000076	0	Venta	Venta	LT2300
	29	Venta	a Upé	Venta	žemiau Mažeikių	LTR82	2015	390928.5001	6252723.25	BIOR data	DDTsum	DDT visas	mikrg/l	0.015938	0.025	0.003	0.009062	0	Venta	Venta	LT2300
	39	Venta	a Upé	Venta	žemiau Mažeikių	LTR82	2015	390928.5001	6252723.25	BIOR data	Benzo(k)fluoranthene	Benzo(k)fluorantenas	mikrg/l	0.000025	0.00017	0.00005	0.000145	0	Venta	Venta	LT2300
Н		Venta Venta		Venta Venta	žemiau Mažeikių žemiau Mažeikių	LTR82 LTR82	2015 2015				Benzo(k)fluoranthene Benzo(g,h,i)perylene	Benzo(k)fluorantenas Benzo(g,h,i)perilenas	mikrg/l mikrg/l	0.000025	0.00017 0.00017	0.00005	0.000145				LT2300

- Search for necessary data, results in attribute table;
- Export tables as excel or other file format;
- Add new data to the feature classes or edit old data;
- Sort by name, results, data, year, station and e.t.c.;

## Use of file geodatabase and feature classes (II)

- Make new analysis, for example, buffer zones, distance to pollutants, different statistics;
- Make additional maps as necessary;
- Join data, make other geodatabases and feature classes;
- Use project results for HELCOM reports and other needs.

### Benefits for us

- We can understand Lithuanian quite good to write something in Lithuanian 😳
- Now we know where to look on LT-LV border, to find transboundary pollution
- We have increased our knowledge of priority substances



Benefits & Issues





Maskavas 165, Rīga www.meteo.lv www.lvgmc.lv lvgmc@lvgmc.lv Tālr. 67032600, Fakss 67145154