Surface water monitoring system in Estonia

KESKKONNAAGENTUUR

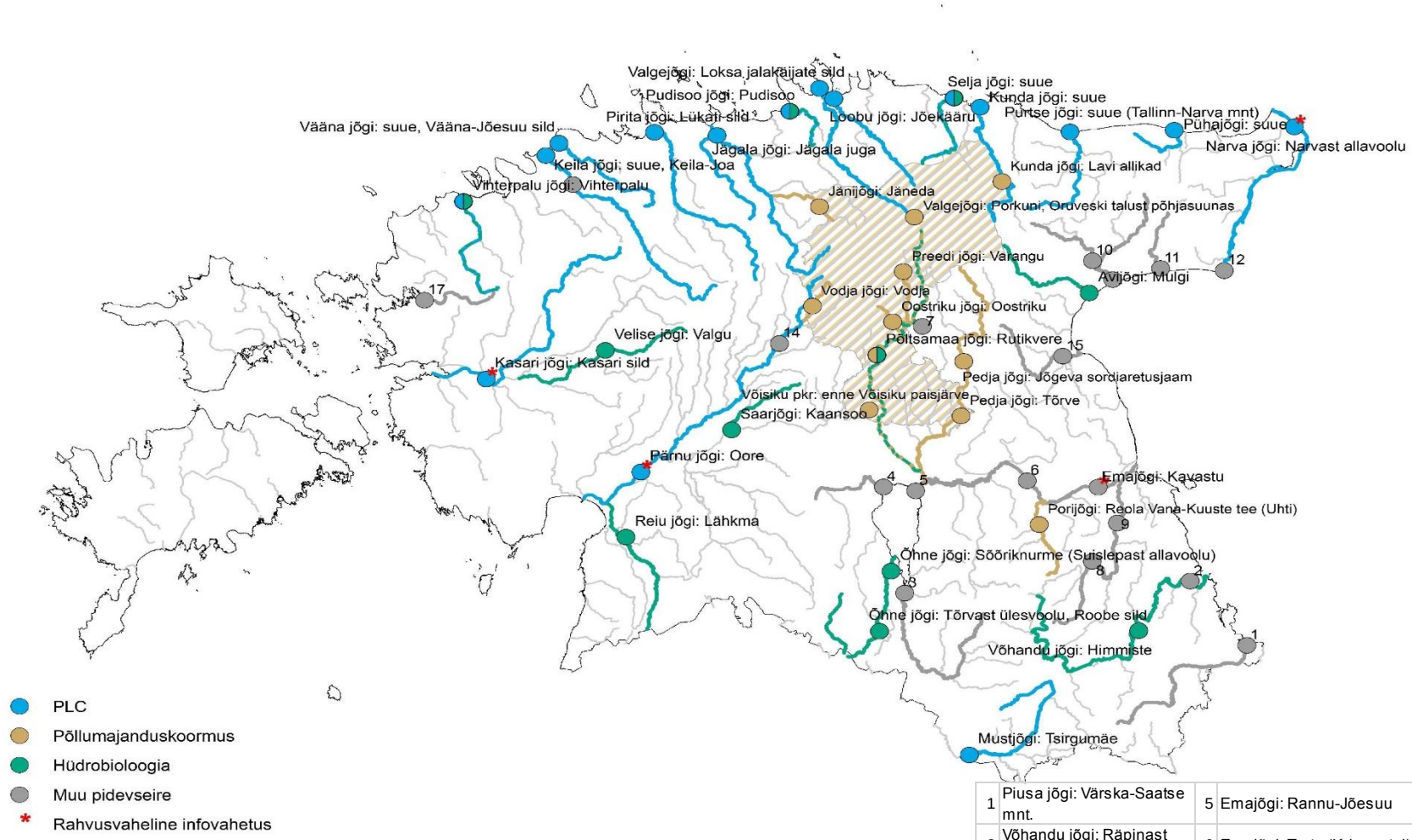
View words about surface water monitoring principles in Estonia (according to surface water monitoring sub-program)

- Surface water monitoring sub-programm measures the network of waterbodies monitored annually and quality elements monitored – 11 lake water body, 10 river waterbody in hydrobiological monitoring, 52 waterbody in hydrochemical monitoring

<u>Koiva river basin:</u>

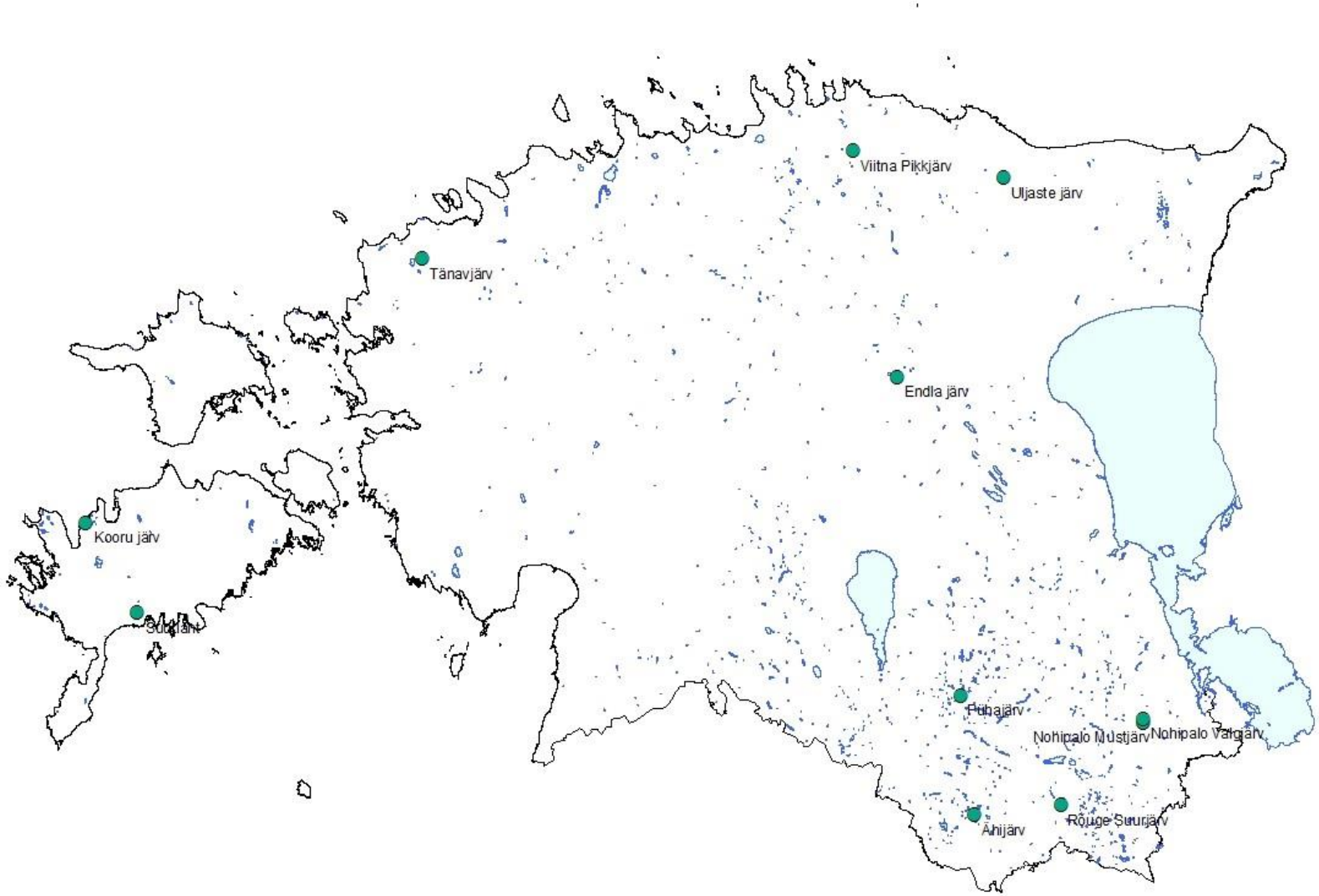
- One transboundary river is monitored every year (Mustjõgi: Tsirgumäe)
- No transboundary lake is monitored every year

Network of rivers monitored annually (52 + 10)



1	Piusa jõgi: Värska-Saatse mnt.	5	Emajõgi: Rannu-Jõesuu	9	Ahja jõgi: Lääniste sild	13	Keila jõgi: Keila linn
2	Võhandu jõgi: Räpinast allavoolu, Ristipalo küla	6	Emajõgi: Tartu (Kvissental)	10	Tagajõgi: Tudulinna	14	Pärnu jõgi: Türi-Alliku
3	Väike-Emajõgi: Pikasilla	7	Linnusaare oja: Linnusaare	11	Alajõgi: Griini (Alajõe)	15	Kullavere jõgi: hüdrokeemia - Tartu-Mustvee mnt sild
4	Tänassilma jõgi: Kõrtsi (Oiu)	8	Ahja jõgi: Kiidjärve	12	Narva jõgi: Vasknarva	16	Rannapungerja jõgi: Mustvee mnt sild
						17	Taebla jõgi: Saunja sild

Network of lakes monitored annually (11)



- Waterbodies monitored once per water management period are measured on River basin water management plan (WMP)
  - In case not enough resources available, also principles of selection are brought on sub-program
- Waterbodies for chemical state assessment are measured in WMP (Mustjõgi: Tsirgumäe in Koiva river basin)
- According to current WMP all lakes measured as waterbody is monitored and choice of river waterbodies is monitored (often there is more than one waterbody per river).

- Monitoring network in Koiva river basin according to current WMP
  - All together 8 lake water bodies are in Koiva river basin
    - all of them are monitored on current WMP period (including hydromorphologically)
    - all of them was monitored on previous period
  - All together 20 river waterbodies are in Koiva river basin (including one strongly modified – type 1A, Mustjõgi Antsla Litsmetsa jõest Pärlijõgi)
    - 17 of them are monitored on current WMP period (according to current WMP; including the one monitored every year)
    - 5 of them were monitored on previous WMP period
    - 3 transboundary waterbody in Koiva/Gauja river basin:– Mustjõgi: Tsirgumäe (2B, 3B_9), Musjõgi:Taheva (2B, 3B_9), Pedetsi: Huuhanna sild (1A; 1A_2)

- Waterbodies of Salaca/Salatci river basin, which in Estonian side are currently part of East Estonia river basin (Salatsi, Ruhja, Ramata, Puzupe) or West Estonia river basin (Õhne, Pedeli)
  - 2 transboundary waterbodies in monitoring
    - Pedeli river (East Estonian river basin) (2B; 1B_10)
    - Ruhja river (Western Estonian river basin) (1B; 1B_10)
  - Waterbodies in monitoring (additionally to transboundary bodies)
    - 2 waterbodies on Õhne river (2B_49; 2B_10; monitored annually physio-chemically (Õhne 2 and 3) and hydrobiologically (Õhne 2)
    - 2 waterbodies on Pedeli river (1B_10)
    - Puzupe stream (1_A)

- Ecological quality elements monitored: phytoplankton, zooplankton, fishes, phytophentos, zoobenthos, macrophyts, fishes
- Chemical parameters for chemical state assessment: 31.12.2015 Regulation of the Ministriy of the Environment nr 77 para 3 parameters
- Supportive quality elements measured - physio-chemical parameters, specific substances and, hydromorphology

- Physio-chemical parameters monitored in lakes (May, July, August, September)
  - surface layer (transparency, pH, temperature, O2, conductivity, Ntot, Ptot, NH4, NO3, PO4, KHt-Cr, BHT5, yellow substance, color, SO4, HCO3, oxygen saturation rate, total dissolved substances
  - bottom layer and jump layer (than exists):Ntot, Ptot, yellow substance, HCO3
- Physio-chemical parameters monitored in rivers (February, April, August, October)
  - Key parameters : pH, temperature, conductivity, Ntot, Ptot, NH3, NO3, PO4, KHT-Mn, color, BH5, transparency, suspended, SO4, Cl, HCO3
  - Mustjõgi: Tsirgumäe (12 timers per year)
    - Key parameters (12 times per year)
    - supplementary parameters: Ca, Mg, Na, K, Si (2 times per year)
    - heavy metals: Cu, Cd, Pb, Zn, Hg, Ni, Cr-tot, Ba, roughness, TOC, DOC (4 times per year, at least on PLC year)
    - Parameters for chemical state assessment (4 times in year from water, 1 time in year from sediments and biota)
    - River basin specific substances (measured on water, except metals witch is measured also on sediments and biota): on current WMP period all Regulation 77 § 6 parameters of the Ministry of the Environment

- According to surface water sub-program hydromorfology surface waterbodies are assessed once during three WMP period
  - Hydromorfology of rivers are assessed base in map analysis
    - All lake waterbodies are assessed during current WMP
    - ~ 250 river waterbodies assessed; additional ones located in Koiva river basin will be assessed as part of the project
- Need for methodological developments: mostly related to big lakes: fishes (Peipsi), hydromorfology (Peipsi, Võrtsjärv)
- Developments needed are more related to class boundaries (state assessment)

State of waterbodies in Koiva River basin and Salatsi River basin in Estonia

Name of waterbody	Ecological state (ES) WMP 2013-2016	ES not good element 2013-2016	ES not good parameter 2013-2016	ES not good reason 2013-2016	Change of ES 2013 tp 2016
Ahelo	good	missing	missing	missing	same
Hargla	boor	FYBE	IPS, WAT, 100-TDI	unknown	same
Koiva	good	missing	missing	missing	same
Kolga	good	missing	missing	missing	same
Kuura	good	missing	missing	missing	same
Laanemetsa	good	missing	missing	missing	same
Mustjõgi_1	good	missing	missing	missing	same
Mustjõgi_2	good potential	missing	missing	missing	better
Mustjõgi_3	goog	missing	missing	missing	same
Mustjõgi_4	goog	missing	missing	missing	same
Mustjõgi_5	excellent	missing	missing	missing	same
Pedetsi	good	missing	missing	missing	same
Peeli	good	missing	missing	missing	same
Peetri	excellent	missing	missing	missing	same
Punaoja	good	missing	missing	missing	same
Pärlijõgi_1	boor	FISH	missing	dams	same
Pärlijõgi_2	good	missing	missing	missing	better
Ujuste	good	missing	missing	missing	same
Vaidava_1	boor	FISH	unknown	dams	better
Vaidava_2	good	missing	missing	missing	same
Transboundary river basin					
Pedeli_1	good	missing	missing	missing	same
Pedeli_2	good	missing	missing	missing	same
Pedeli_3	goog	missing	missing	missing	same
Ruhja	boor	FISH	missing	missing	worse
Õhne_1	good	missing	pmissing	missing	same
Õhne_2	boor	FISH	JKI	dams	same
Õhne_3	boor	FISH	JKI	dams	worse
Puzupe	good potencial	missing	missing	missing	same

Name of waterbody	Ecological state (ES) WMP 2013-2016	ES not good element 2013-2016	ES not good parameter 2013-2016	ES not good reason 2013-2016	
Aheru järv	boor	FYKE, FYPLA	Chl_a,FP_J,FPK,N-üld,pH,Secchi	nutrients	worse
Hino järv	good	missing	missing	missing	same
Kirikumäe järv	boor	FYKE, SUSE	N-üld, P-üld, SD, T, ASPT, EPT	nutrients	same
Köstrejärv	boor	MAFY	taksons, mändvetikas, penikeel, kardhein	old pollution, lake in inproving	worse
Murati järv	boor	FYKE, SUSE	pH, SD, T, ASPT, EPT	SUSE naural drift	same
Pabra järv	good	missing	missing	missing	same
Pullijärv	bood	FYKE, FYPLA	N-üld, pH, Secchi, FPK, J	nutrients	same
Ähijärv	boor	FYKE, FYPLA	FP_J,FPK,pH,P-üld,Secchi	unknown	worse

Monitoring of waterbodies in Koiva River basin and Salatsi river basin in Estonia

Name of waterbody	2018	2017	2016	2015	2014	2013	2012	2011	2010	Earlier
Ahelo										
Hargla		+		+			+			
Koiva										
Kolga						+				
Kuura										
Laanemetsa										
Mustjõgi_1										2003
Mustjõgi_2										2005
Mustjõgi_3		+								
Mustjõgi_4		+								
Mustjõgi_5	+	+	+	+	+	+	+	+	+	
Pedetsi		+							+	
Peeli										2007 (HYMO)
Peetri										2005
Punaoja					+	+			+	
Pärlijõgi_1										
Pärlijõgi_2		+		+					+	
Ujuste										
Vaidava_1										2009 (FISH)
Vaidava_2		+					+		+	
Transboundary river basin										
Pedeli_1										
Pedeli_2							+			
Pedeli_3							+			
Ruhja		+				+				
Õhne_1										
Õhne_2	+	+	+	+	+	+	+	+	+	
Õhne_3	+	+	+	+	+	+	+	+	+	
Puzupe										

Not monitored

Name of waterbody	2018	2017	2016	2015	2014	2013	2012	2011	2010
Aheru järv			+			+			
Hino järv		+							+
Kirikumäe järv		+							+
Köstrejärv	+						+		
Murati järv		+							+
Pabra järv		+							+
Pullijärv		+							+
Ähijärv	+	+	+	+	+	+	+	+	+

Thank you for your attention

Kadri Auväärt

Environment Agency of Estonia

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