



LATVIJAS VIDES, ĢEOLOĢIJAS
UN METEOROLOĢIJAS CENTRS

Transboundary groundwater body delineation in Latvia-Estonia cross-border area

Dāvis Borozdins, Hydrogeologist, LEGMC

Project 1st online meeting

September 29, 2020



Interreg
Estonia-Latvia
European Regional Development Fund

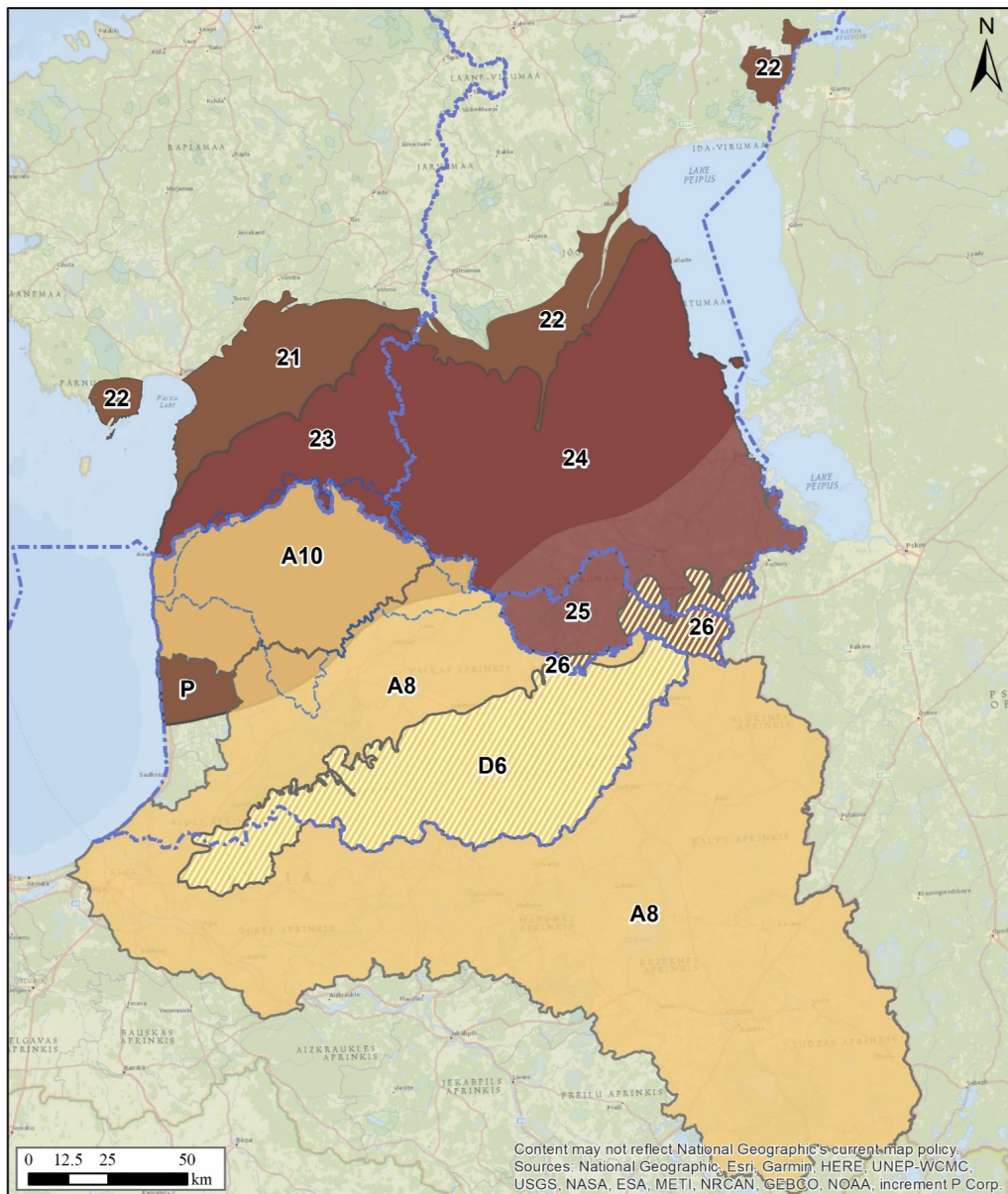


EUROPEAN UNION

WaterAct

Joint actions for more efficient management
of common groundwater resources

Cross-border GWBs in Latvia and Estonia



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Groundwater bodies in Estonia:

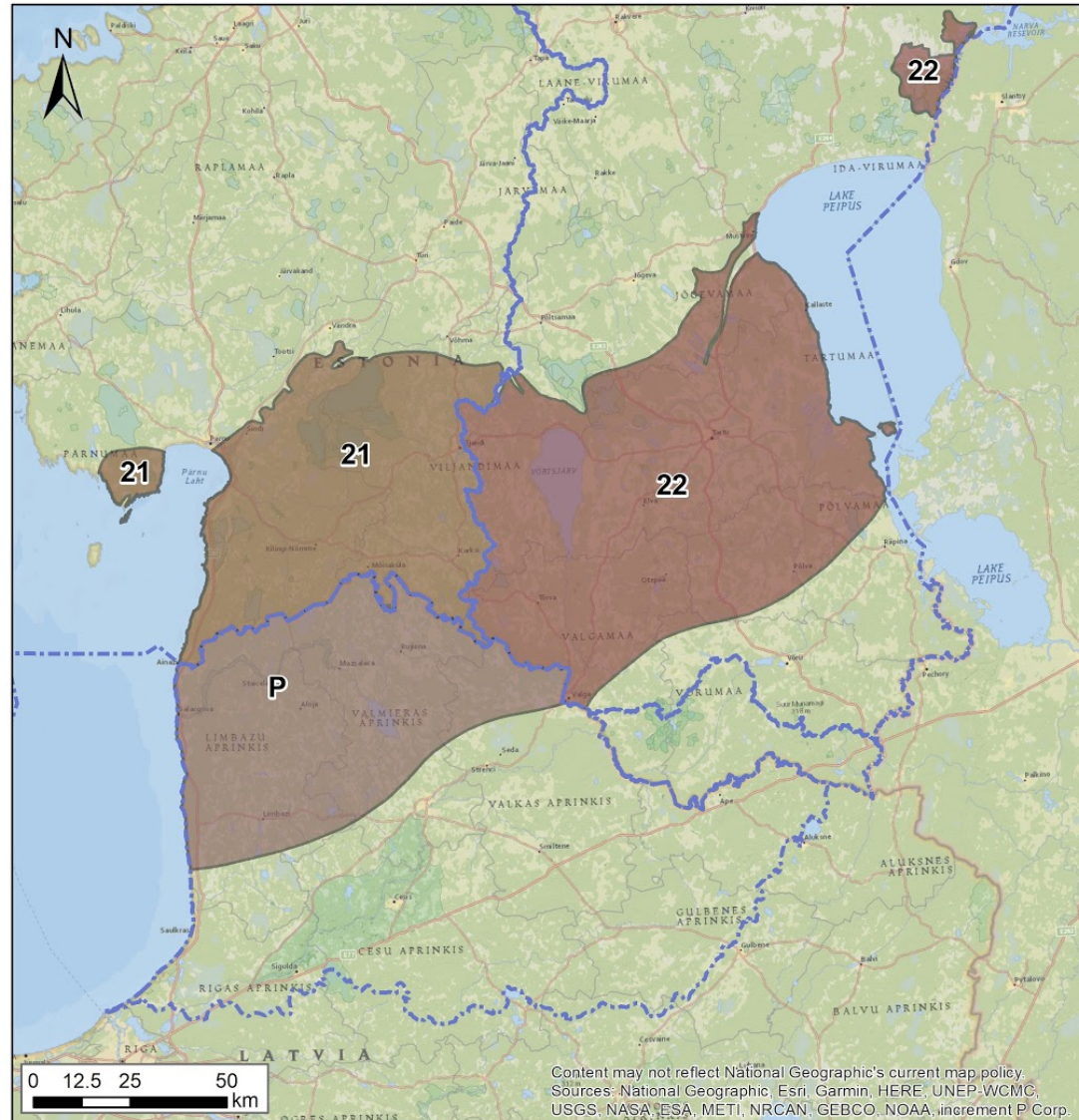
- 21** West-Estonian RB Lower - Middle Devonian aquifer system
- 22** East-Estonian RB Lower - Middle Devonian aquifer system
- 23** West-Estonian RB Middle Devonian aquifer system
- 24** East-Estonian RB Middle Devonian aquifer system
- 25** Gauja/Koiva RB Middle Devonian aquifer system
- 26** Upper Devonian aquifer system

Groundwater bodies in Latvia:

- P** Lower - Middle Devonian aquifer system
- A8** Middle - Upper Devonian aquifer system
- A10** Middle - Upper Devonian aquifer system
- D6** Upper Devonian aquifer system

 RBD borders

1.GWBs in Lower-Middle Devonian aquifer system



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Groundwater bodies in Estonia:

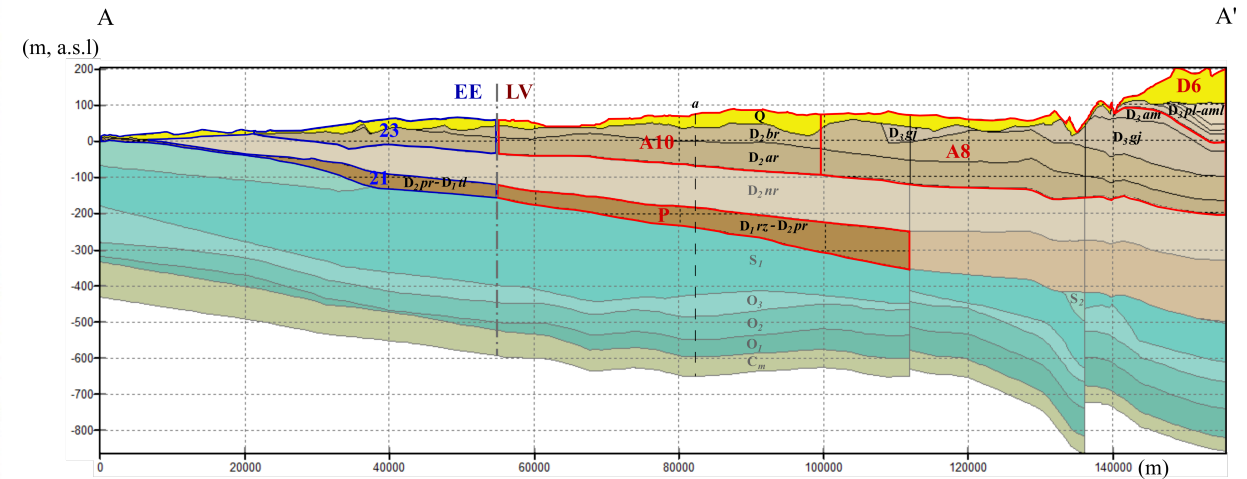
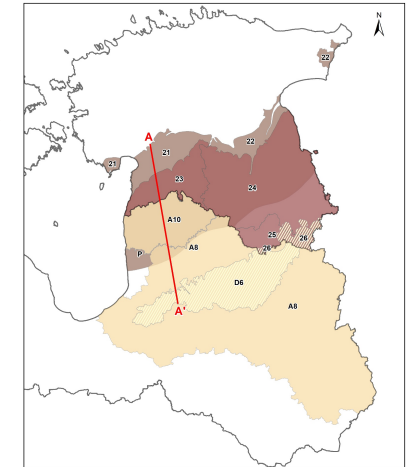
21 West-Estonian RB Lower - Middle Devonian aquifer system

22 East-Estonian RB Lower - Middle Devonian aquifer system

Groundwater bodies in Latvia:

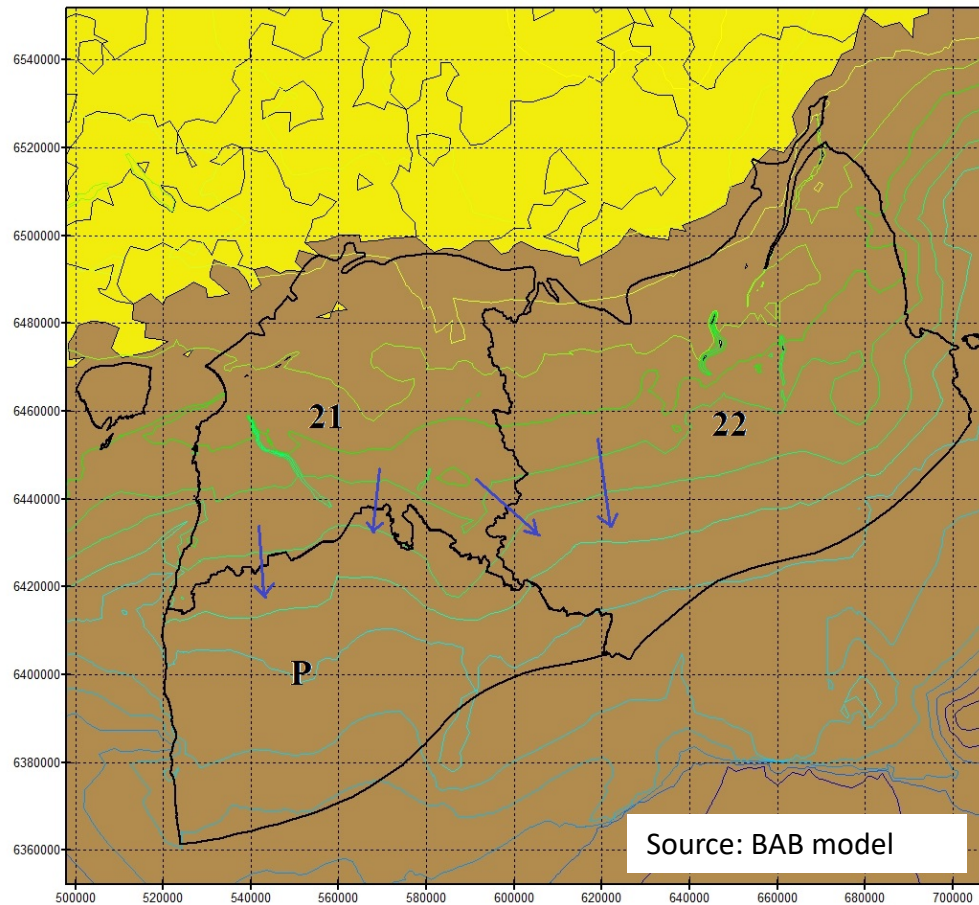
P Lower - Middle Devonian aquifer system

RBD borders



1. GWBs in Lower-Middle Devonian aquifer system

GW flow map:



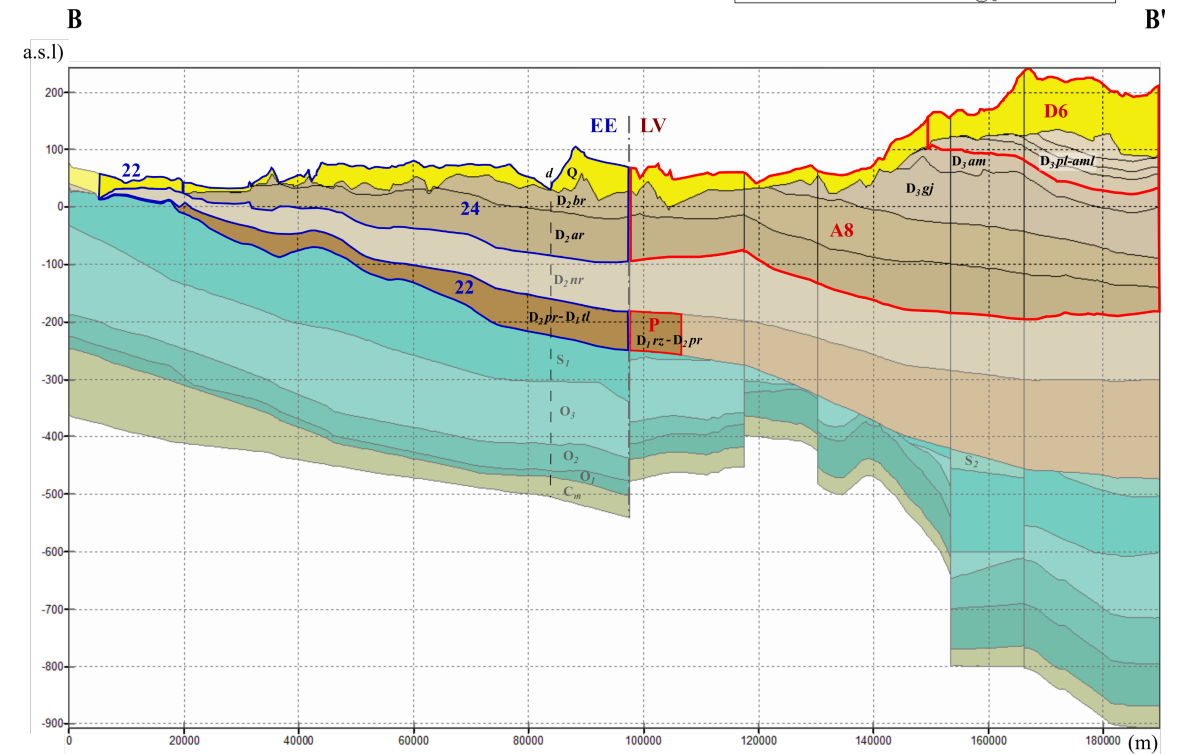
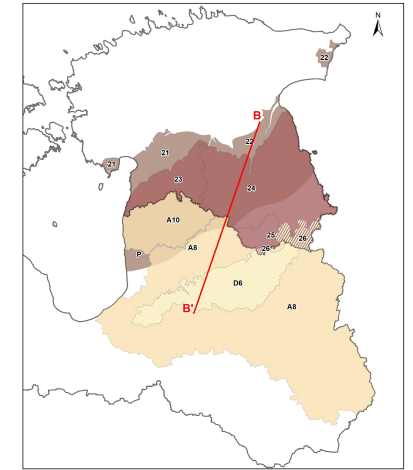
LEGEND

Groundwater bodies in Estonia:

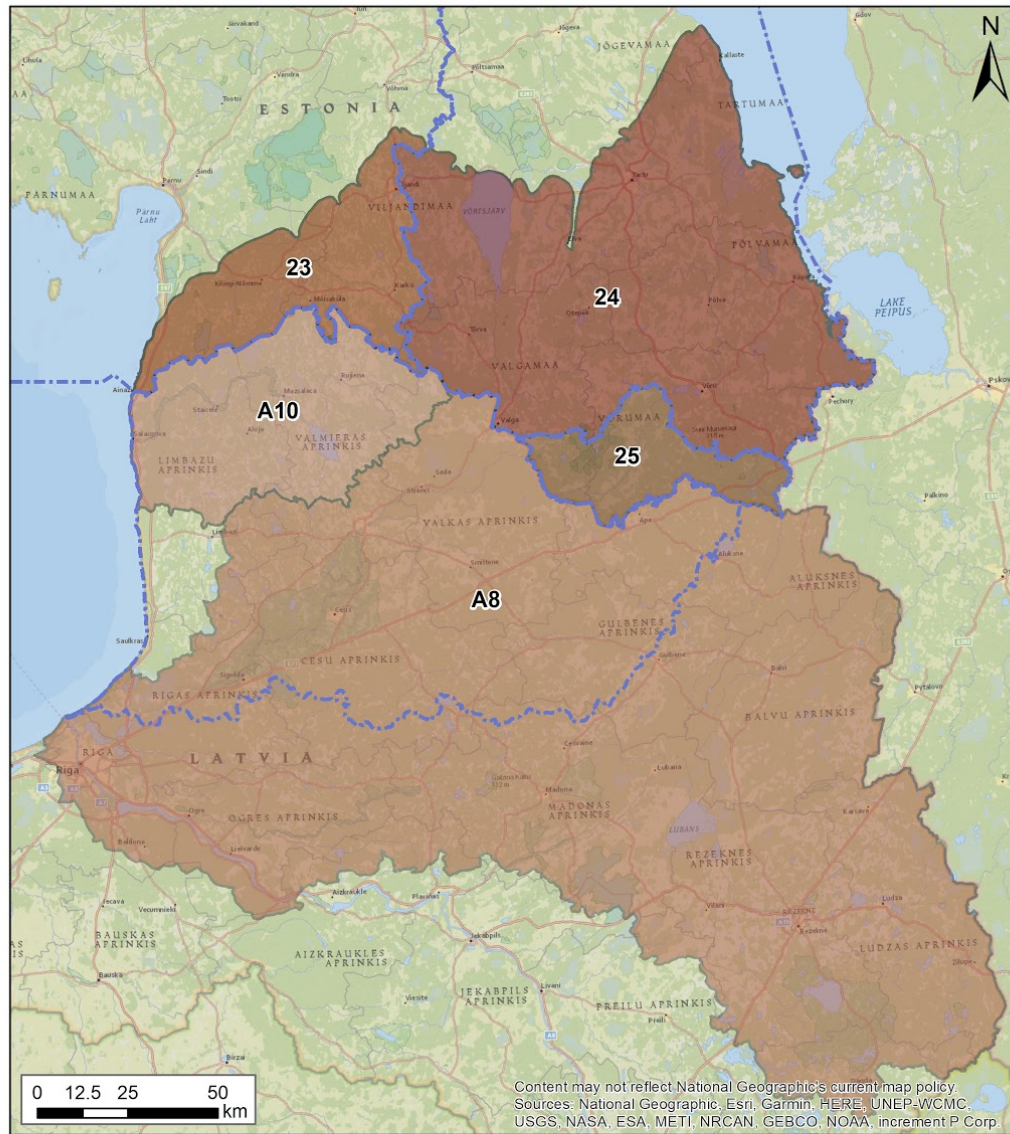
- 21** West-Estonian RB Lower - Middle Devonian aquifer system
- 22** East-Estonian RB Lower - Middle Devonian aquifer system

Groundwater bodies in Latvia:

- P** Lower - Middle Devonian aquifer system



2.GWBs in Middle Devonian aquifer system



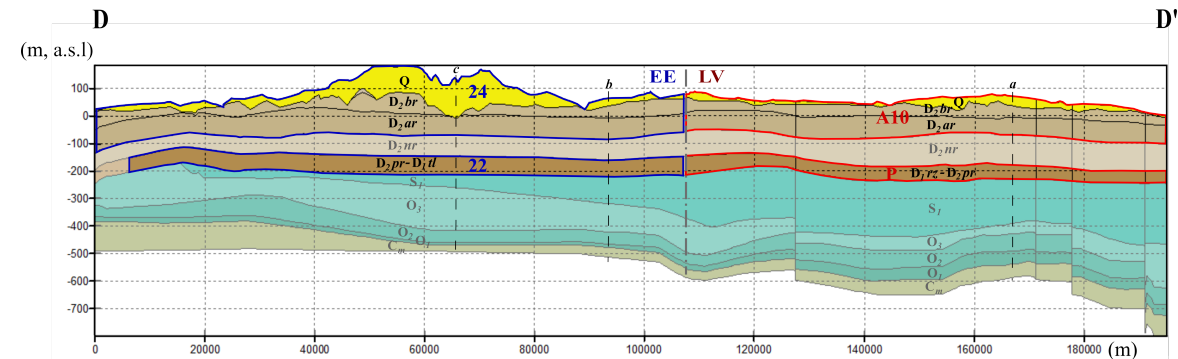
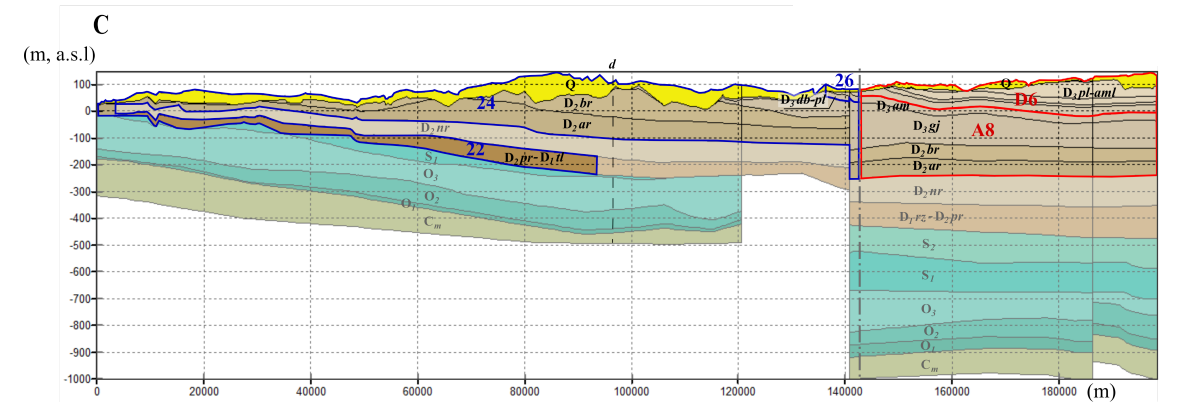
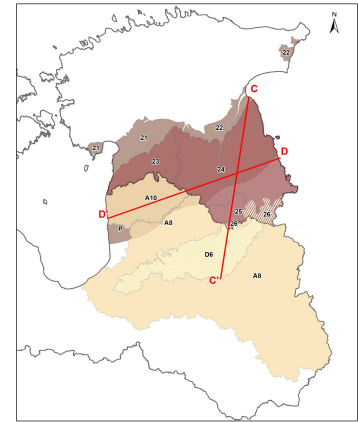
LEGEND

Groundwater bodies in Estonia:

- 23** West-Estonian RB Middle Devonian aquifer system
- 24** East-Estonian RB Middle Devonian aquifer system
- 25** Gauja/Koiva RB Middle Devonian aquifer system

Groundwater bodies in Latvia:

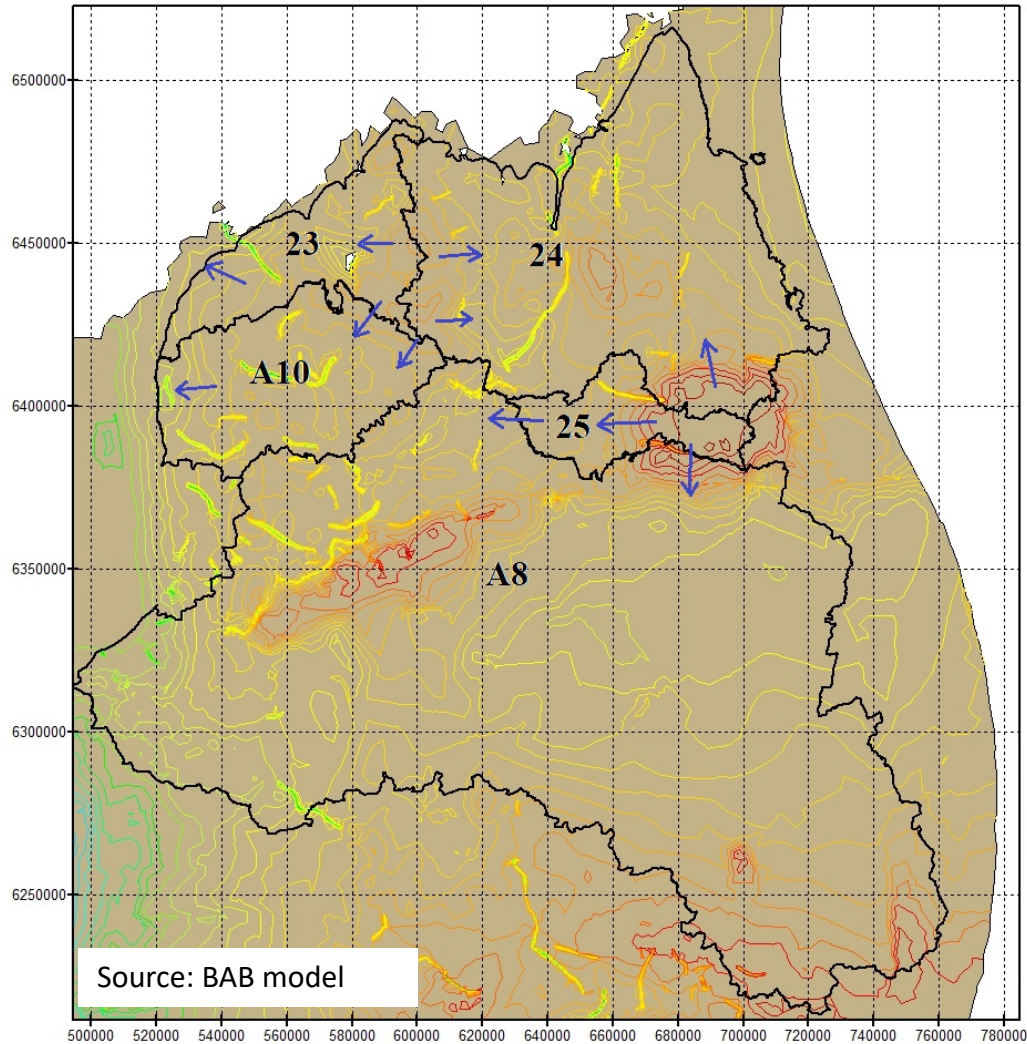
- A8** Middle - Upper Devonian aquifer system
- A10** Middle - Upper Devonian aquifer system
- RBD borders



Content may not reflect National Geographic's current map policy.
Sources: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

2.GWBs in Middle Devonian aquifer system

GW flow map:



Source: BAB model

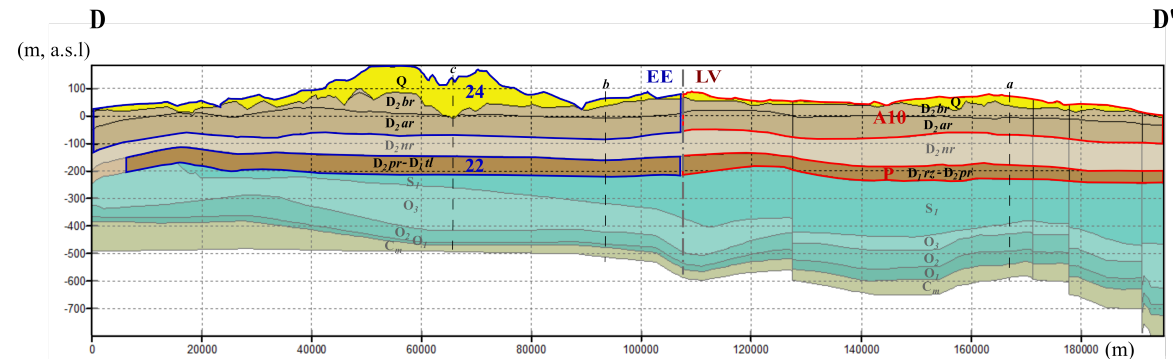
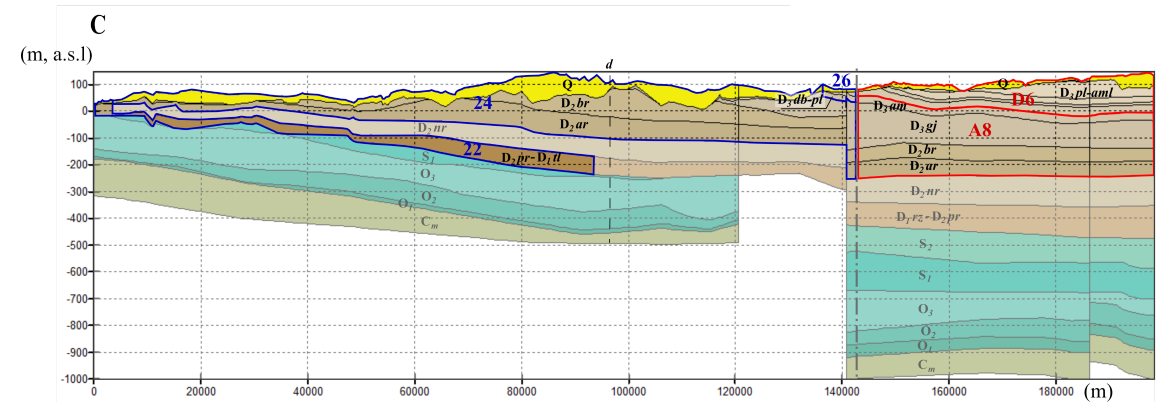
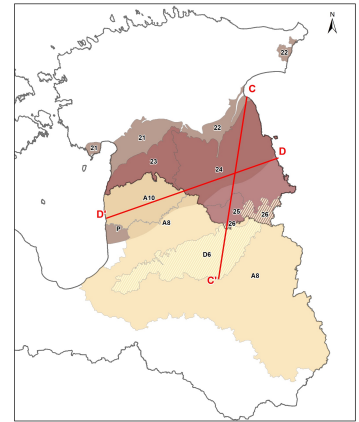
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Groundwater bodies in Estonia:

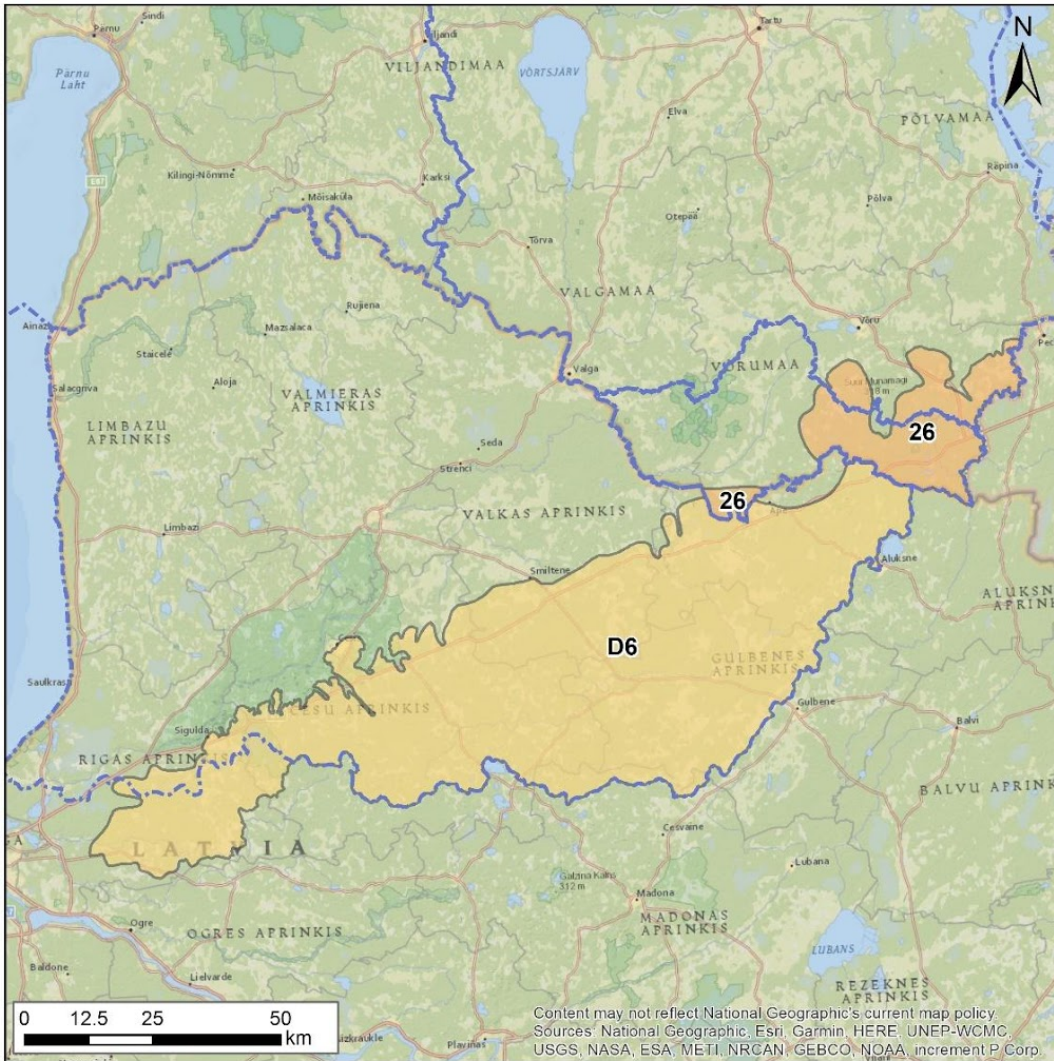
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Groundwater bodies in Latvia:

- A8** Middle - Upper Devonian aquifer system
- A10** Middle - Upper Devonian aquifer system



3.GWBs in Upper Devonian aquifer system



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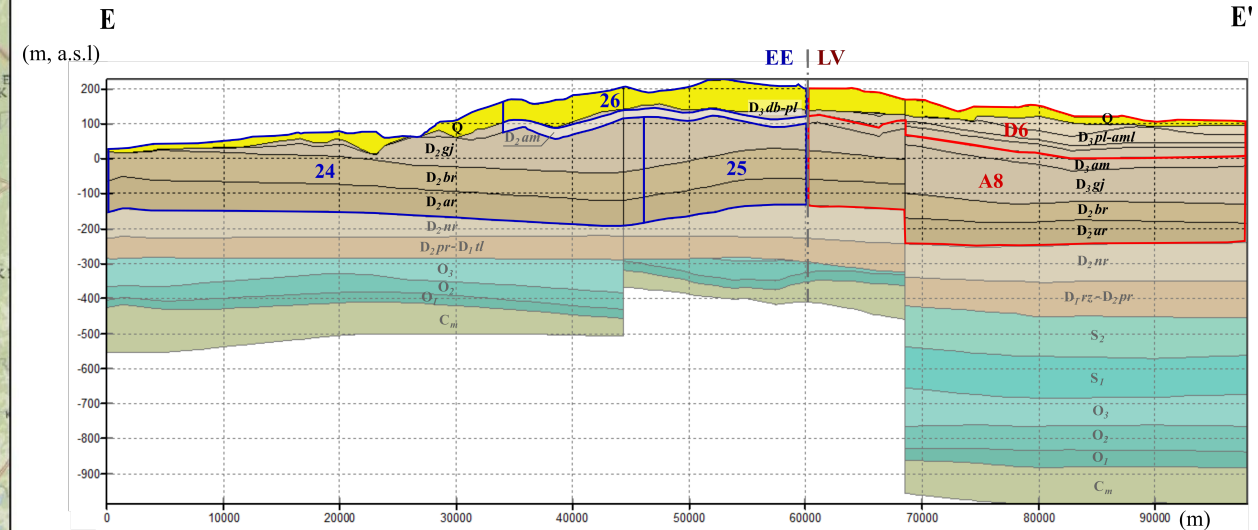
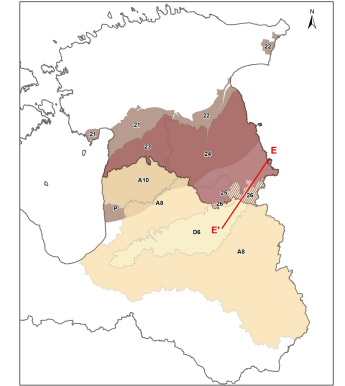
Groundwater bodies in Estonia:

26 Upper Devonian aquifer system

Groundwater bodies in Latvia:

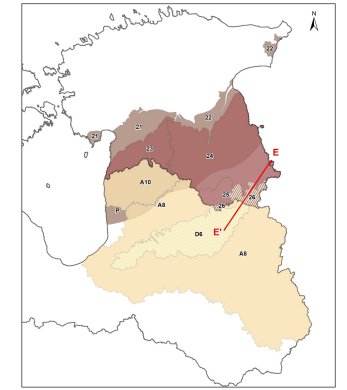
D6 Upper Devonian aquifer system

RBD borders

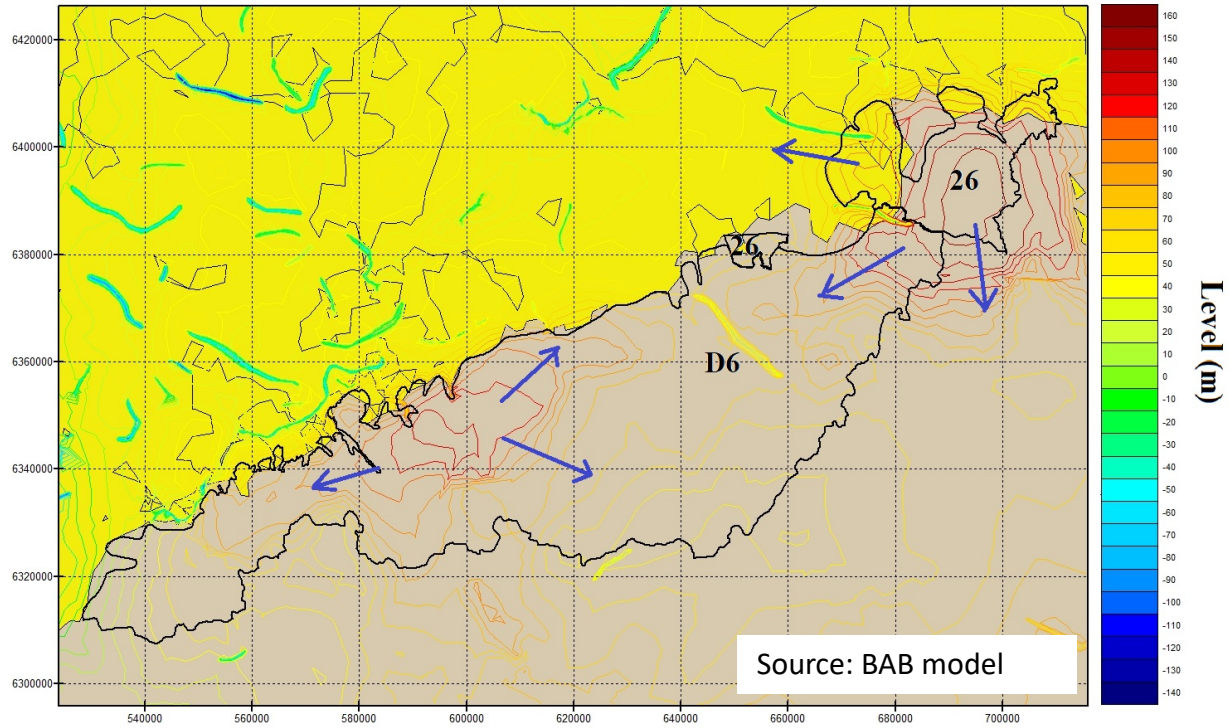


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3.GWBs in Upper Devonian aquifer system



GW flow map:



Source: BAB model

LEGEND

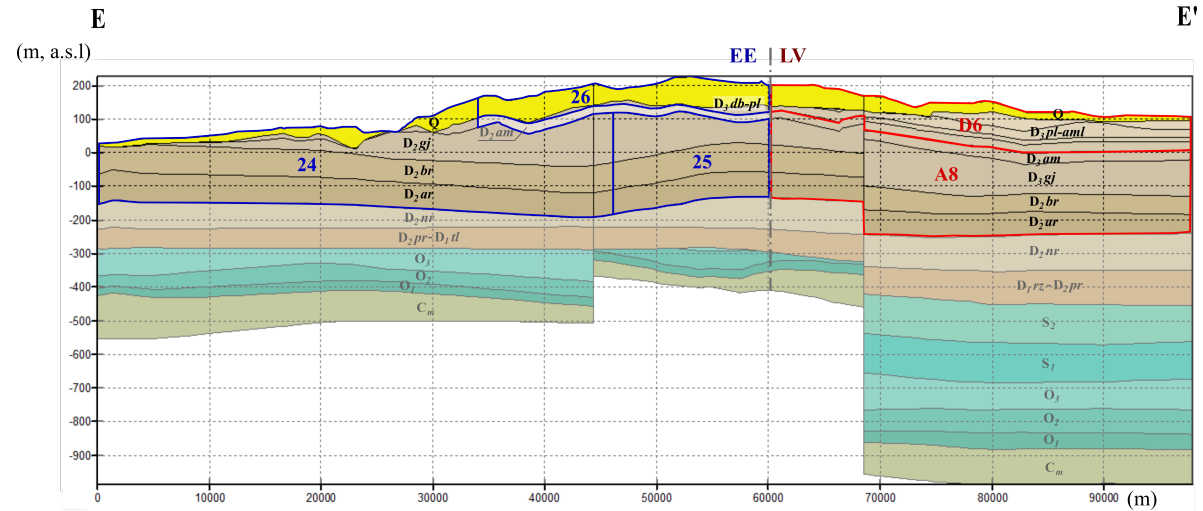
Groundwater bodies in Estonia:

26 Upper Devonian aquifer system

Groundwater bodies in Latvia:

D6 Upper Devonian aquifer system

RBD borders



Stratigraphic unit comparision of active water exchange zone in Latvia-Estonia cross-border area

System/ period	Series	Stage	Regional stage	Lithostratigraphic units		Aquifer symbol	
				LV	EE	LV	EE
Devonian	Upper	Frasnian	Amula	Amula		<i>D₃aml</i>	
			Stipiniai	Stipinu		<i>D₃stp</i>	
			Pamūšis	Ogre		<i>D₃og</i>	
			Katleši	Katleši		<i>D₃kt</i>	
			Daugava	Daugava	Daugava	<i>D₃dg</i>	<i>D₃dg</i>
			Dubnik	Salaspils	Dubniki	<i>D₃slp</i>	<i>D₃db</i>
			Pļaviņas	Pļaviņas	Plavinas	<i>D₃pl</i>	<i>D₃pl</i>
	Middle	Givetian	Amata	Amata	Amata	<i>D₃am</i>	<i>D₂am</i>
			Gauja	Gauja	Gauja	<i>D₃gj</i>	<i>D₂gj</i>
			Burtnieki	Burtnieki	Burtnieki	<i>D₂br</i>	<i>D₂br</i>
		Eifelian	Arukūla	Arukūla	Arukūla	<i>D₂ar</i>	<i>D₂ar</i>
			Narva	Narva	Narva	<i>D₂nr</i>	<i>D₂nr</i>
			Pārnu	Pārnu	Pārnu	<i>D₂pr</i>	<i>D₂pr</i>
				Rēzekne	Rezekne	<i>D₁rz</i>	<i>D₁rz</i>
	Lower	Emsian	Ķemeri				
				Ķemeri	Kemeri	<i>D₁km</i>	<i>D₁km</i>
		Pragian					
Lochkovian		Stonišķiai			<i>D₁gr</i>		
		Tilže	Gargždai gr	Tilže	<i>D₁gr</i>	<i>D₁tl</i>	

Delineation!



- Thank you for the attention!



bit.ly/WaterAct-project



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REPUBLIC OF ESTONIA
MINISTRY OF THE ENVIRONMENT



Nature
Conservation Agency
Republic of Latvia



TALLINN UNIVERSITY



REPUBLIC OF ESTONIA
ENVIRONMENT AGENCY



UNIVERSITY OF
LATVIA



GEOLOGICAL SURVEY OF ESTONIA



VIDZEME
THE ONLY WAY IS UP!



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of common groundwater resources

- Thank you for the attention!



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