

MINISTRY OF THE ENVIRONMENT



Ordovician-Cambrian and Cambrian-Vendian groundwater layers

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The territory of Estonia covers 45 227 km

Groundwater in Estonia



Total amount of groundwater is 2000 km³ .

Groundwater is one of the most important natural resources in Estonia as it provides 70% of the drinking water supply.

The Water Act establishes that the status of groundwater must be kept as close to natural as possible.

Which is why monitoring the status of groundwater is of key importance.

A total 15 different groundwater bodies have been identified in Estonia on the basis of the primary groundwater layers, and the status of each is evaluated according to various indicators.

Transboundary groundwater layers



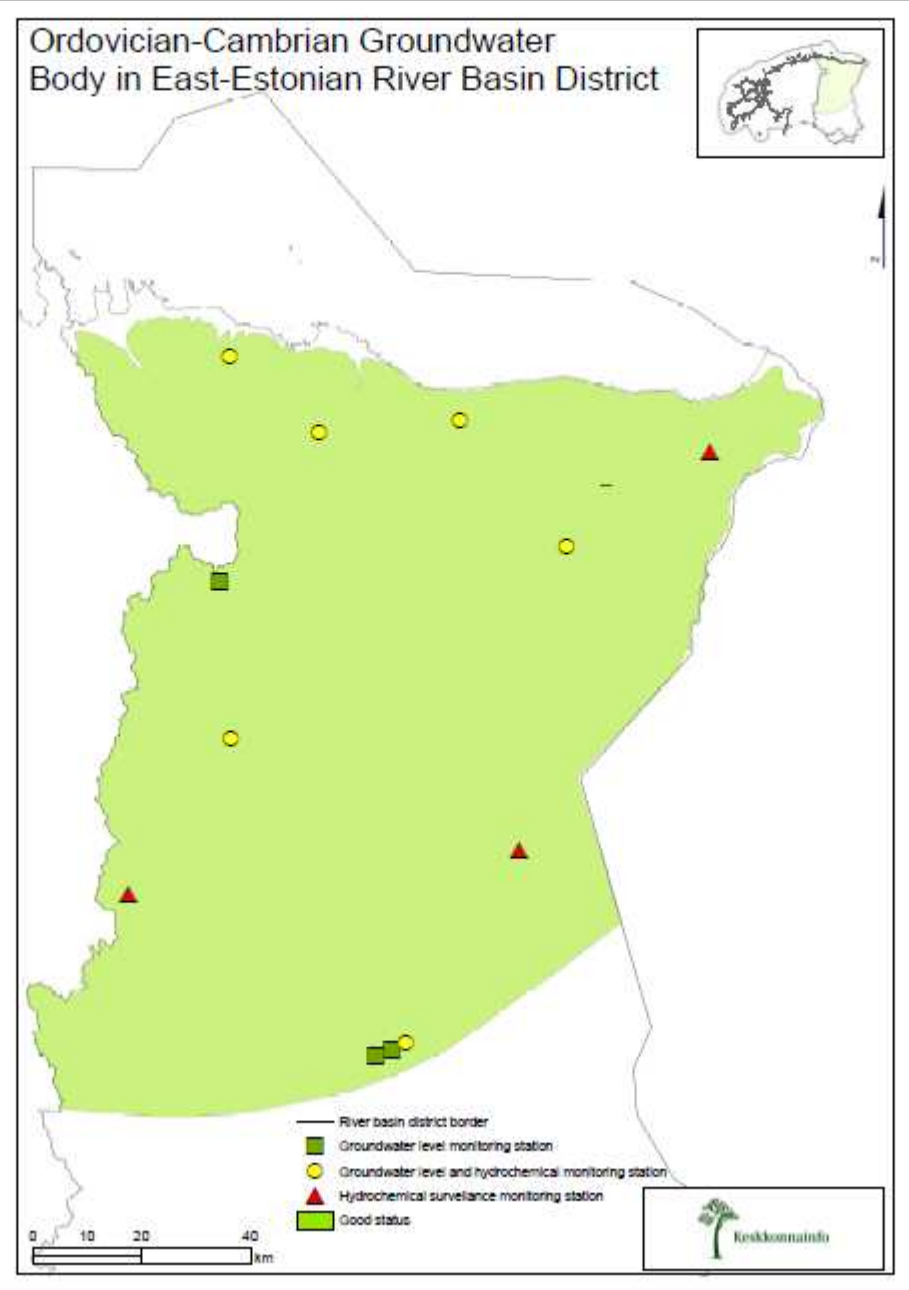
Cambrian-Vendian and Ordovician-Cambrian groundwater layers are shared with Estonia and Russia.

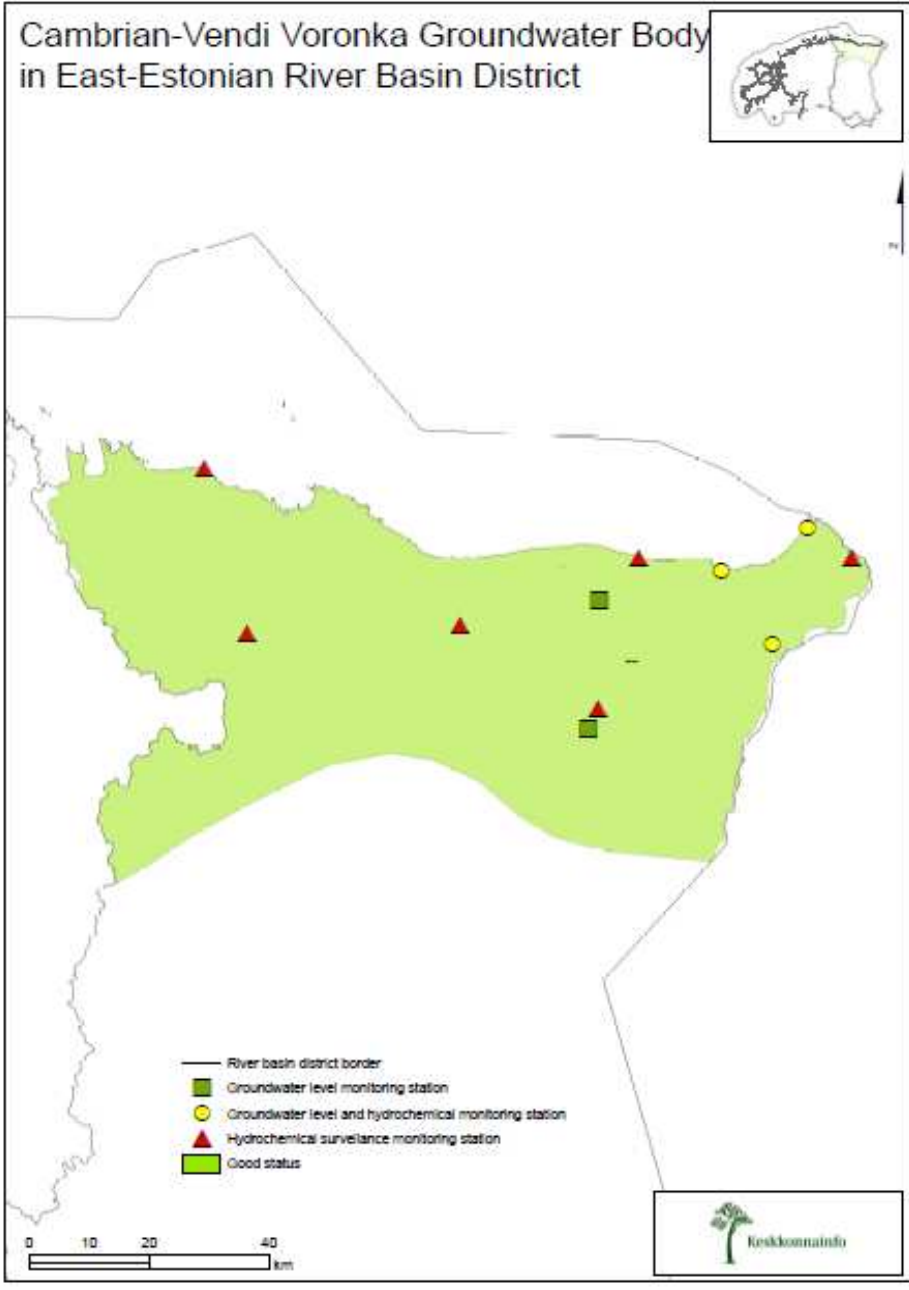
Cm-V and O-Cm are large deep groundwater layers, recharged far from border, not connected to local surface water and groundwater.

No significant transboundary impact has been detected in any of the groundwater layers.

Tabel

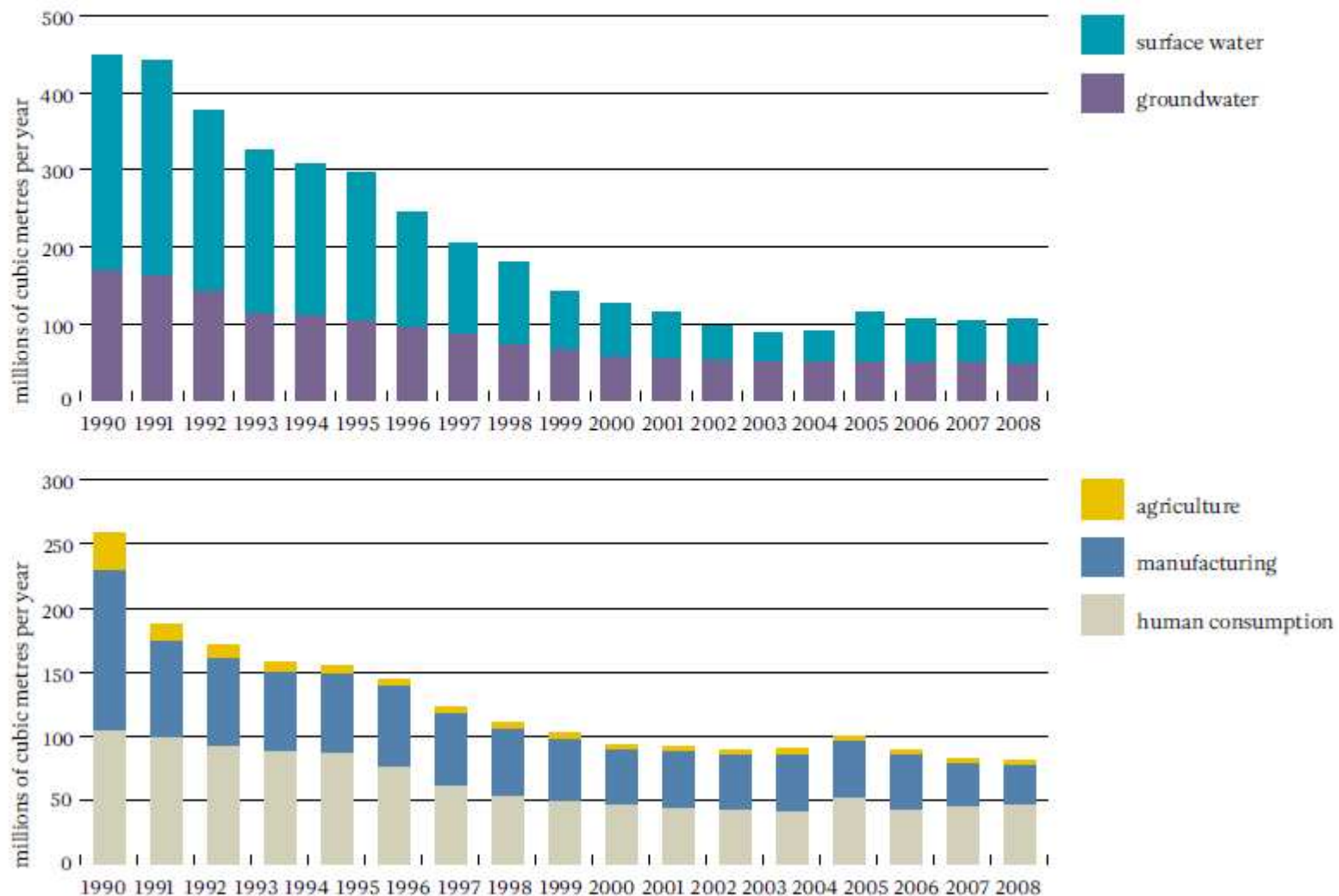
Gronwater-layer¶	Odovician-Cambrian¶	Cambrain-Vendian¶
Predominant lithology¶	Sandstone¶	Sandstone¶
Stratigraphy and age¶	Ordovician and Cambrian systems¶ 488-501 million years ago¶	Cambrian and Vendian systems¶ 501-630 million years ago¶
Thickness:¶ mean/max/areal extent¶	35 m/60 m/33-420 km ² ¶	100 m/130 m/30 000 km ² ¶
Dominant groundwater flow direction¶	From Estonia to Russia¶	From Russia to Estonia¶
Link with surface water systems¶	No link with surface water¶	No link with surface water¶



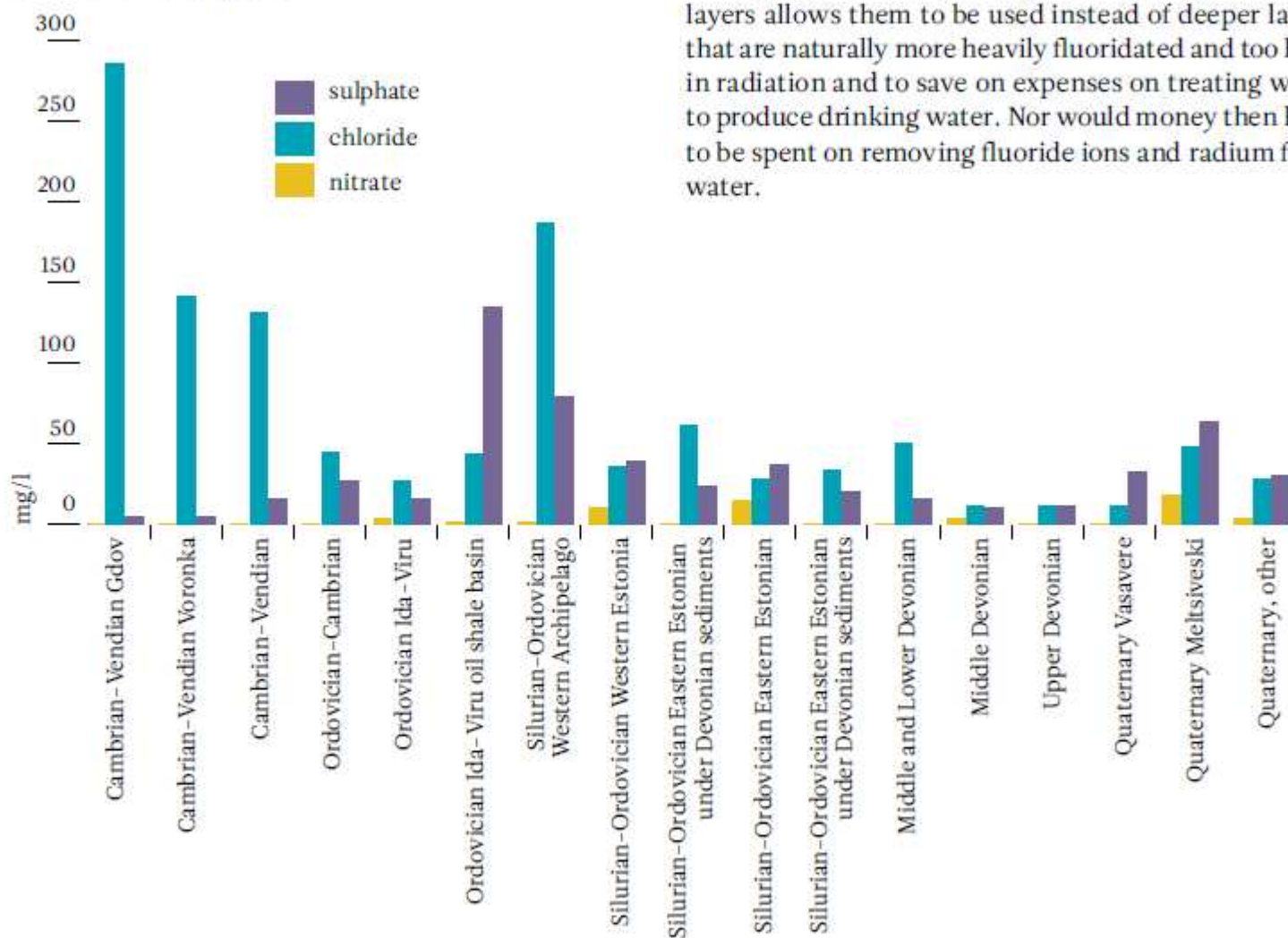


for human consumption, 31 million m³ was used for manufacturing and 4 million m³ for agriculture.

☺ Water abstraction has decreased due to more efficient use of water and restructuring of water-intensive manufacturing.



qualitative status of other groundwater bodies in Estonia can be considered good.



concrete plants, must be eliminated.

Keeping the water quality good in upper groundwater layers allows them to be used instead of deeper layers that are naturally more heavily fluoridated and too high in radiation and to save on expenses on treating water to produce drinking water. Nor would money then have to be spent on removing fluoride ions and radium from water.

Figure 6.11. Average values of selected quality indicators for groundwater bodies, 2006–2008. Data: EEIC.

Threats to groundwater

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East Estonia is an industrial region, where the main natural resource – oil shale – has been mined in opencast and underground mines.

Mine water abstraction have caused salt water upconing in Cm-V aquifer.

Additional monitoring and decrease of water abstraction.



Radium and Radium



Cambrian-Vendian aquifers has recently found to be naturally contaminated, containing Radium and Radium.

Content of natural radioactive elements in groundwater depends on the content of radioactive substances in the rocks that form the water complex.

How to treat water to produce drinking water?



Thank you!

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