

Groundwater monitoring principles in Estonia

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WaterAct

Joint actions for more efficient management
of common groundwater resources



Groundwater monitoring network is similar to Latvian principles

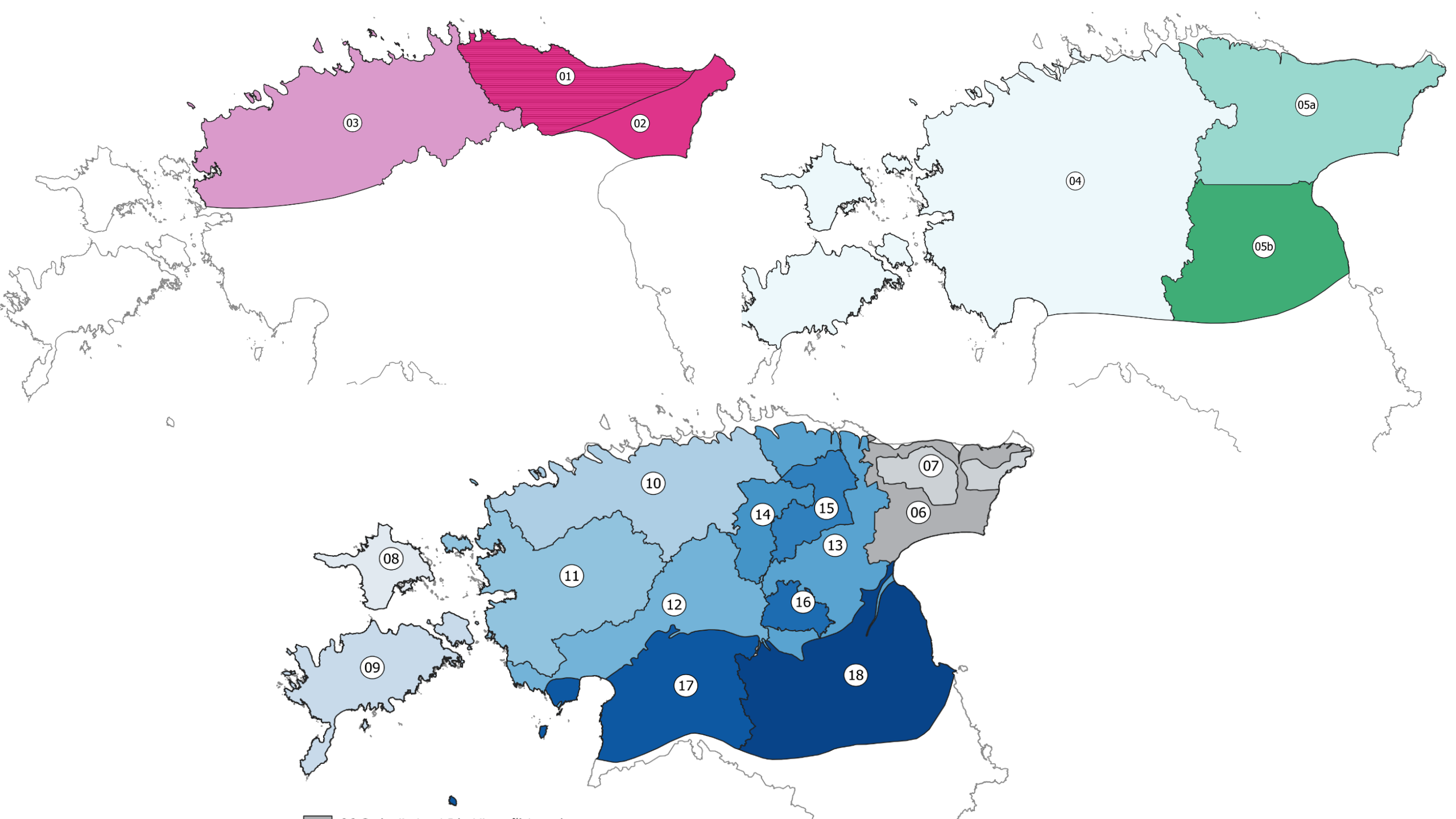
Groundwater observation purposes:

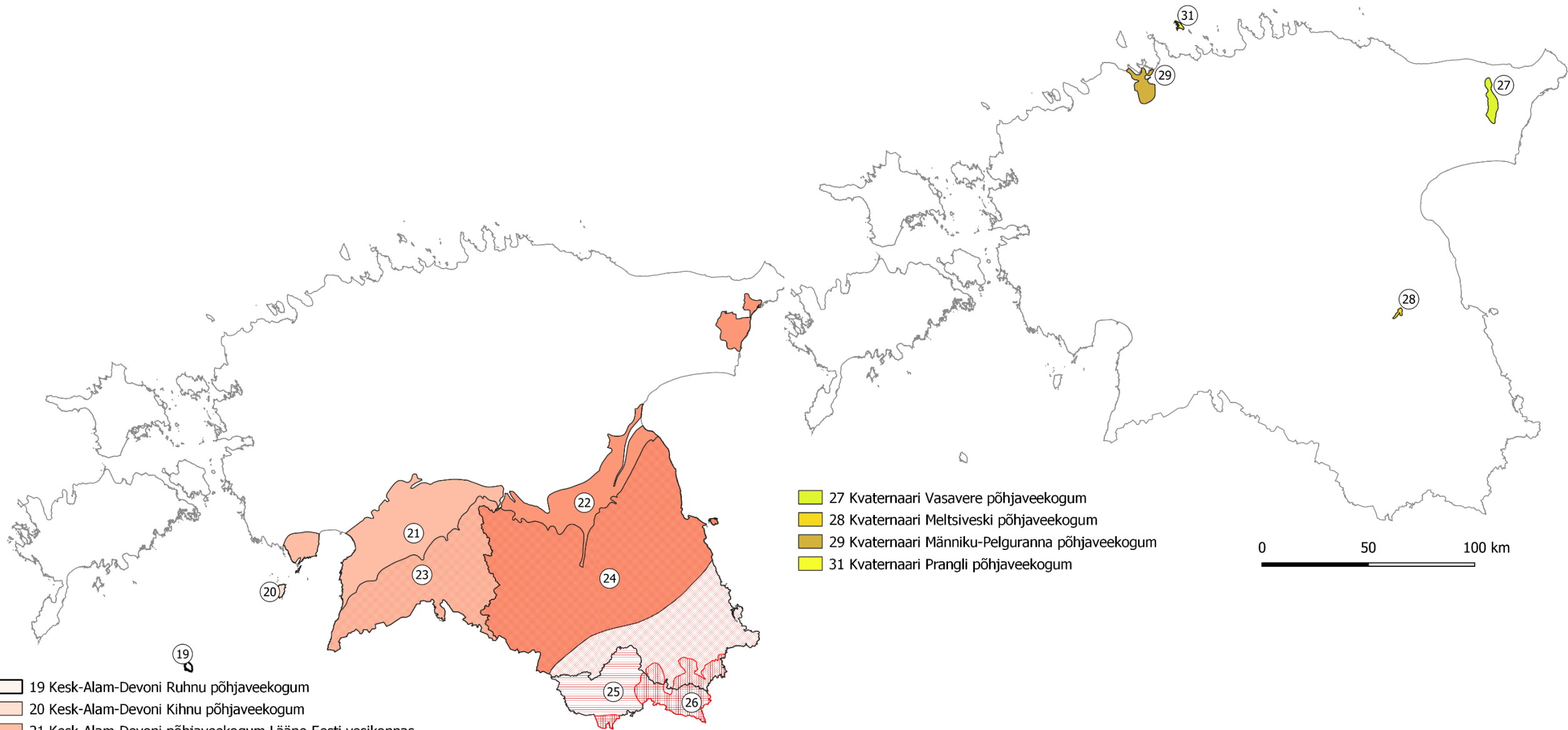
- assessment of quantitative and qualitative status
- assessment of pressures and growth trends of pollutants
- development of River Basin Management Plans
- provides input for the development and evaluation of the effectiveness of groundwater protection measures

Legislation defining the monitoring network:

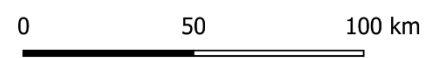
- Water Framework Directive 2000/60/EK
- Groundwater directive 2006/118/EK;
- Nitrate directive 91/676/EK
- Guidance documents N^o.15, N^o.16, N^o.26
- Estonian Environmental Monitoring Act and Water Act



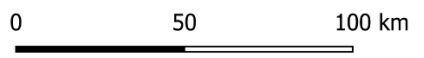




- 27 Kvaternaari Vasavere põhjaveekogum
- 28 Kvaternaari Meltsiveski põhjaveekogum
- 29 Kvaternaari Männiku-Pelguranna põhjaveekogum
- 31 Kvaternaari Prangli põhjaveekogum



- 19 Kesk-Alam-Devoni Ruhnu põhjaveekogum
- 20 Kesk-Alam-Devoni Kihnu põhjaveekogum
- 21 Kesk-Alam-Devoni põhjaveekogum Lääne-Eesti vesikonnas
- 22 Kesk-Alam-Devoni põhjaveekogum Ida-Eesti vesikonnas
- 23 Kesk-Devoni põhjaveekogum Lääne-Eesti vesikonnas
- 24 Kesk-Devoni põhjaveekogum Ida-Eesti vesikonnas
- 25 Kesk-Devoni põhjaveekogum Koiva vesikonnas
- 26 Ülem-Devoni põhjaveekogum

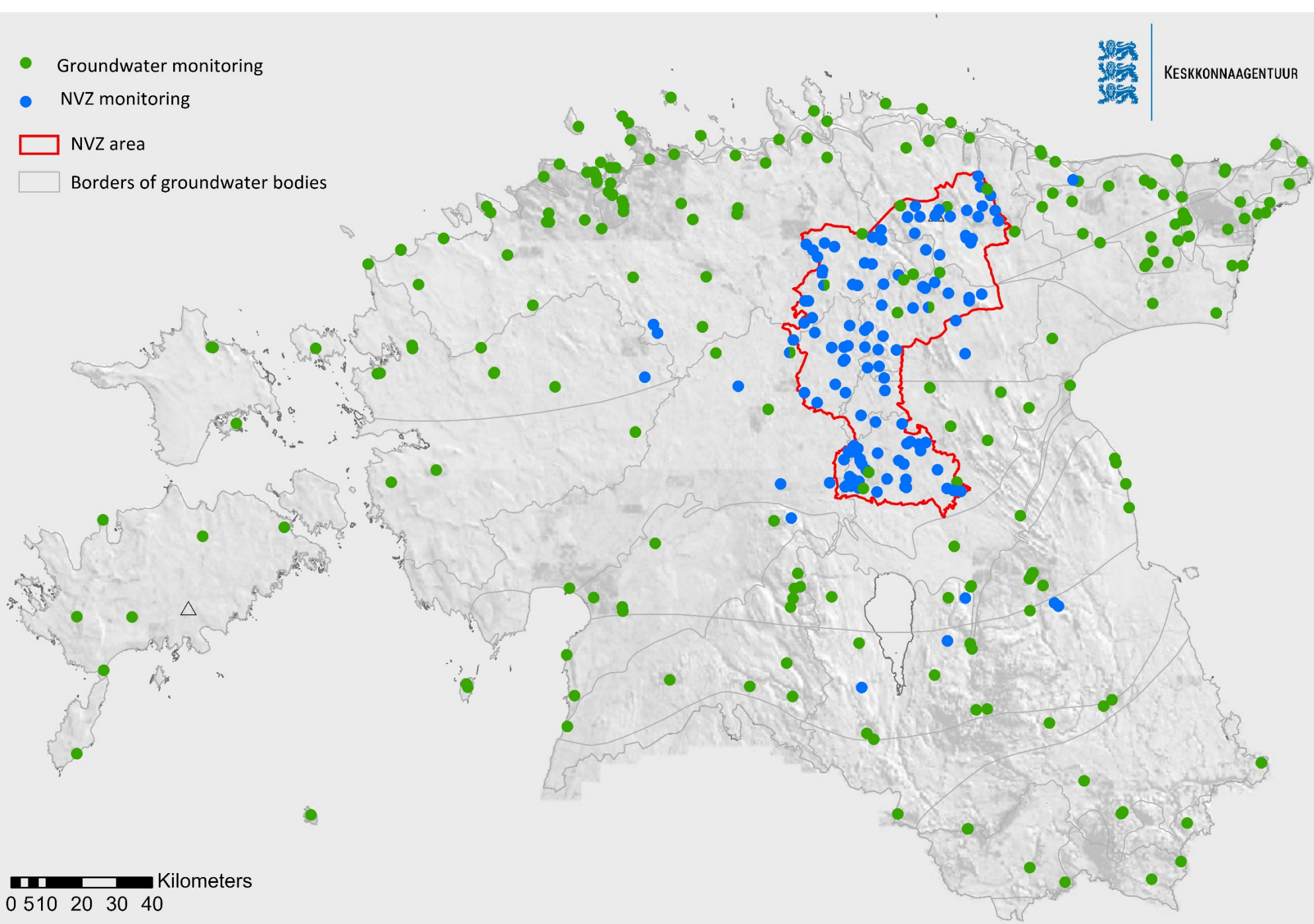


- Groundwater monitoring
- NVZ monitoring
- ▭ NVZ area
- ▭ Borders of groundwater bodies



KESKKONNAAGENTUUR

0 5 10 20 30 40 Kilometers



Monitoring frequency

Quantity monitoring

- **257 wells**
- *163 wells are equipped with automatic level meters that measure groundwater levels daily*
- *at other observation wells, water levels are measured manually from 1 to 12 times a year, depending of the station*

Quality monitoring

- **218 wells**
- *basic chemistry monitoring frequency 1 x per year to 2 x 6 years*
- *Additional pollutants 1 x per year to 1 x 18 years*
- *Sampling time summer*

NVZ (quality) monitoring

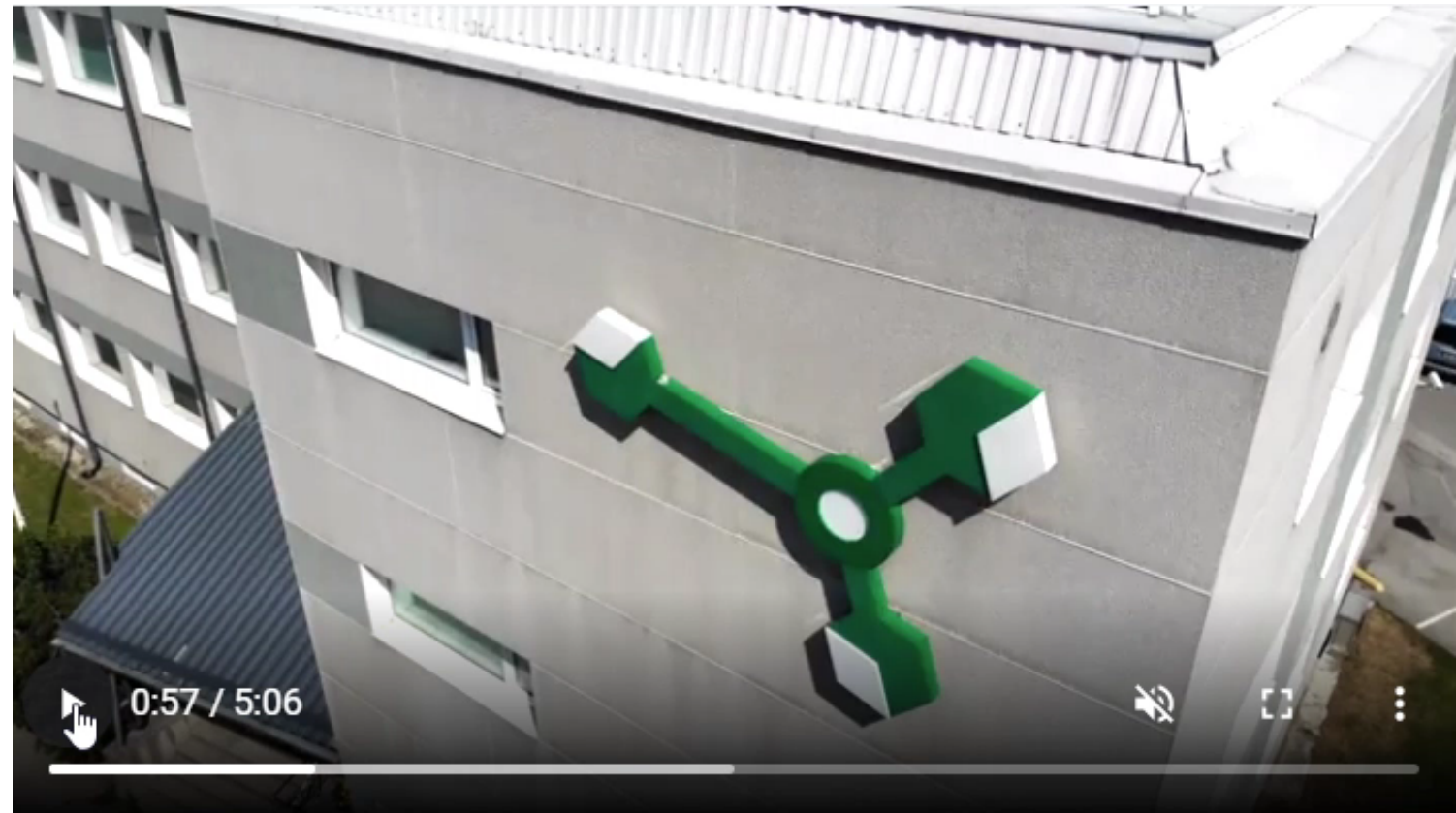
- **109 wells, 25 springs**
- *monitoring frequency from 4 x per year to 1 x 4 years*

Quality monitoring measurements

Types	Parameters	Measurements area
Basic	Field measurments (t, pH, O ₂ , electrical conductivity)	Measured in all monitoring points
	Key ions (Na, K, Ca, Mg, Cl, SO ₄ , HCO ₃ , PO ₄ , tot hardness, Fe _{tot} , Dry residue)	
	Nitrogen compounds and their ionic forms (NH ₄ , NO ₂ , NO ₃ , PHT, CO ₂ , N _{tot} [*] , P _{tot} [*])	
Additional	Heavy metals (Cd, Pb, Hg, As, Ba)	Measured mostly in shallow wells. Frequency: 1x per year to 1x18 years.
	Pesticides	
	Chemical pollutants	

Laboratory

- **Laboratory name** – Estonian Environmental Research Centre
- **Laboratory accredited according to** – EVS-EN ISO/IEC 17025:2017
- **National accreditation number** – L008
- **Water sampling according**
EVS EN ISO 5667-1,
EVS EN ISO 5667-3,
EVS EN ISO 5667-11,
EVS EN ISO 5667-14,
EVS EN ISO 5667-15



Est-Lat harmonized transboundary monitoring

We are compiling a new monitoring program for new RBMP in 2021-2027 where we add new parameters and consider better connections with surface water

- Delineation of transboundary waterbodies
- Location of monitoring sites
- Sampling timing and frequency
- Sampling and data processing techniques
- Forwarding monitoring results in May each year?

- Thank you for the attention!



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