Estonia

Capital city: Tallinn
Inhabitants: 1 Million

INSTITUTIONAL SETTING AND PURPOSE

The Ministry of Environment of the Republic of Estonia is the general coordinator of the monitoring programme in cooperation with the Environmental Board, the Environmental Inspectorate, the Environment Agency and the Environmental Investment Centre.

The National Environmental Monitoring Programme consists of sub-programmes, and one of them is the Groundwater Monitoring programme. This sub-program is divided into sections: monitoring of groundwater bodies (31 units) and monitoring of groundwater in the nitrate vulnerable zone. All groundwater bodies are subject to surveillance monitoring.

Changes in groundwater levels are monitored for the evaluation of the quantitative status of groundwater. The network for monitoring the chemical status of groundwater aims at providing a reliable evaluation of groundwater quality at every groundwater body. The monitoring network also aims to describe the natural and anthropogenic changes in the chemical composition of groundwater and the significant and constant changes in pollutant concentrations; and to evaluate the achievement of environmental objectives for areas that are dependent of groundwater and need protection. Based on the data collected, it is possible to plan the sustainable consumption of groundwater, prevent depletion and to assess the quality and suitability of groundwater for drinking purposes.

CHARACTERISTICS OF THE NETWORK

The monitoring of the quantitative status of groundwater bodies includes measuring groundwater levels and, if necessary, groundwater flow in springs and discharge points in water courses or other inland bodies of surface water. In relatively homogeneous confined groundwater bodies (sand, sandstone), it is sufficient to measure the water level 3-5 times per month and in homogeneous unconfined groundwater bodies, 5-10 times per month. The measuring frequency of Silurian-Ordovician confined groundwater bodies with fissures and karst should be 5-10 times per month and in unconfined groundwater bodies with fissures and karst 10 times per month.

Data about pollutants which put the good status of a groundwater body at risk or cause a bad chemical status of a groundwater body are collected during operational monitoring of chemical status.

In areas at risk of agricultural pollution, nitrogen compounds (especially NO3 and NH4) must be monitored, and, depending on the level of protection of the groundwater body, also the possible content of pesticide and fertilizer residues in shallow layers. Additionally, the content of nitrites and phosphorus-containing compounds in groundwater should be also monitored.

The monitoring program also includes the conductance of surveys. They are used to identify pollution sites, assess the groundwater status of contaminated and polluting areas and plan implementation of safeguard measures.

The monitoring programme has been prepared in accordance with the WFD for a period of 6 years, therefore it may be subjected to changes upon concluding monitoring agreements.

PROCESSING AND DISSEMINATION

Monitoring networks of groundwater bodies and nitrate vulnerable zones are presented with the Esri Map story on the Environmental Agency website, Figure 1. When a user selects an observation point, the information on its relation to a river basin, groundwater body name and ID, hydrogeological layer, xy coordinates, number of water level measurements per year, sensor type are shown.

The National Support Observation Network of Estonia consists of stations recording groundwater levels and the main physical and chemical parameters.

Updated monitoring programmes are available on the website of the Ministry of Environment. Results of monthly and annual average, minimum and maximum groundwater levels of monitoring wells, results of chemical analysis and field measurements are transferred into a groundwater monitoring database.

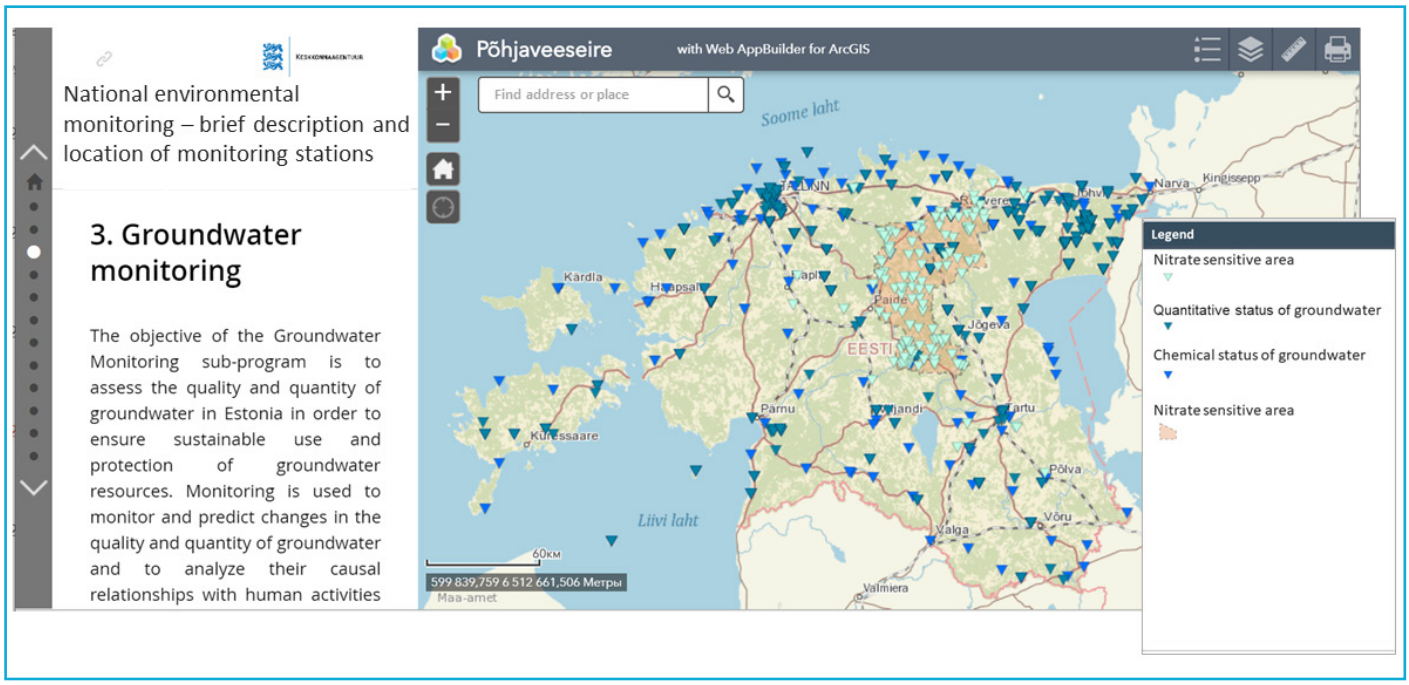

Figure 1 - ESRI map story compiled with the National Environmental Monitoring Program

Figure 2 - Antu blue springs lake, Estonia, Europe, by: Artenex

Sources

- **Environment Ministry of Estonia, groundwater** - https://www.envir.ee/et/eesmargid-tegevused/vesi/pohjavesi;
- **Feedback from the Ministry of the Environment** - received on 22-04-2020;
- **The Environmental Agency of Estonia, environmental monitoring** - https://www.keskkonnaagentuur.ee/et/seire;
- **Environment Ministry of Estonia, groundwater monitoring system in Ida-Viru County** - https://www.envir.ee/et/eesmargid-tegevused/vesi/pohjavesi/pohjaveeseire-susteem-ida-viru-maakonnas; and
- **Updated monitoring programmes, Ministry of Environment** - http://www.envir.ee/et/kavade-ja-programmide-eelnoud.