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Voluntary spring monitoring to make invisible groundwater visible

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Groundwater accounts for nearly 99% of all liquid freshwater on Earth. Not only does groundwater provide almost half of the global drinking water supply and ensures the well-being of humans and sustain dependent ecosystems (rivers, lakes, and wetlands), it is an essential aspect in climate change mitigation too. Despite the exceptional importance of groundwater in social, economic, and environmental processes, it remains poorly understood, mismanaged, and often neglected. In order to increase global awareness of groundwater protection, the theme for World Water Day 2022 was “Groundwater: Making the invisible visible” with the culminating event - the first UN-Water Summit on Groundwater held in Paris on 7-8 December. Data collection and sharing on groundwater were among the key actions highlighted during the Summit because “we cannot manage what we do not measure”.

One of the ways to make groundwater visible is to demystify the underground resources beneath our feet through citizen science. Many volunteer water monitoring programs have generated valuable data sets around the world. Data collection by volunteers is cost- and time effective, supports local communities by raising awareness of groundwater protection, and boosts outdoor tourism. Moreover, such campaigns provide information on water bodies that would otherwise remain unmonitored and, if carefully designed, can be used by national water managers and even support decision-making.

Here we present a joint Estonian-Latvian web-based application for the volunteer monitoring of springs launched in February 2021 (accessible by allikad.info and avoti.info). The web-based map application aims to collect new information on already known springs and locate new ones by providing clear guidelines on how to carry out proper spring monitoring. More than 200 users have already joined the application and approximately 600 new springs have been added to the database. Together, 1132 new observations have been made and 2930 images of springs have been added. This valuable information source has been recently recognized by national water managing authorities and used to improve the transboundary groundwater monitoring network between Estonia and Latvia. We will present how citizen science can improve groundwater management, as well as our success stories and lessons learned.

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