

Fresh Groundwater Monitoring in Georgia, the European Union Water Initiative Plus project supports Georgia in implementing the EU Water Framework Directive and in improving its monitoring network

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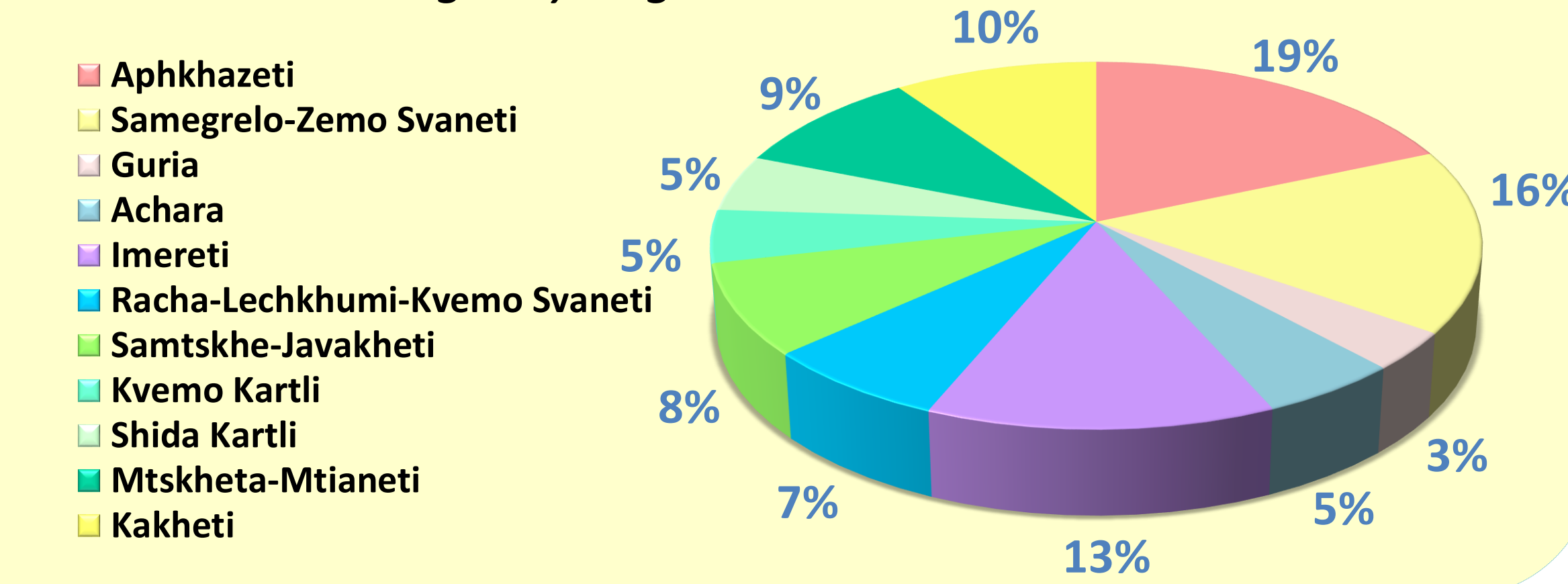
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Background:

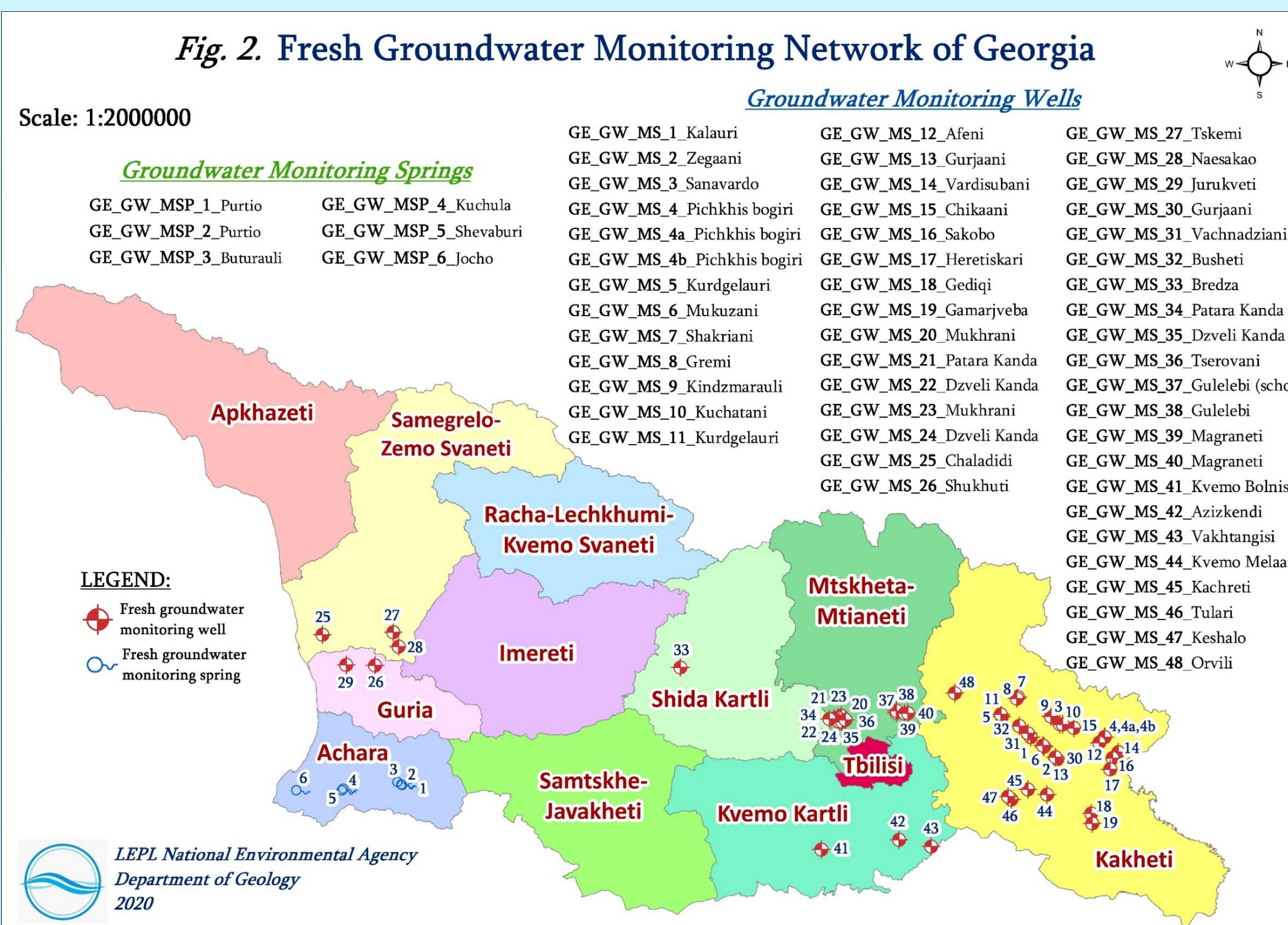
Georgia is among the countries which have fresh groundwater distinguished for significant resources and drinking qualities of naturally high quality. Detailed hydrogeological surveys show that Georgia's natural fresh groundwater resources amount to 573 m³/sec and that water has the highest quality. The resources have rather uneven geographical and administrative distribution (Figure 1). Hydrogeological exploration and monitoring works for the purpose of identification, study and protection of fresh groundwater were not conducted in the period of 1990–2013.

Fig. 1. Distribution of fresh drinking groundwater resources in Georgia by Regions



What is the current situation?

Considering the long-term termination of centralized researches and the intensively increasing anthropogenic pressures on the environment and on water in particular, the assessment and protection of groundwater resources becomes a very pressing issue. For this purpose, in 2013, on initiative of the Geology Department of LEPL National Environmental Agency of Georgia and the Czech Development Agency, restoration of the hydrogeological monitoring network and research of fresh groundwater using modern methodology began. Currently, 56 water points (mainly wells) are being monitored.



Twice a year, the NEA conducts chemical and bacteriological analysis of water samples from the water points entering the monitoring network. Information bulletin are prepared twice a year based on hydrogeological monitoring results. The bulletins are public and accessible to all interested parties.

What is the monitoring methodology?

Hydrogeological equipment is installed at each well. The installed equipment performs continuous automatic monitoring of main quantitative and qualitative parameters of groundwater regimes:

- Water level and discharge;
- Water temperature;
- pH;
- Electric conductivity;
- TDS.

Figure 3 and 4 show the monitoring data for one of the stations.

Fig. 3. Monitoring data - 01.01.2016-01.01.2020

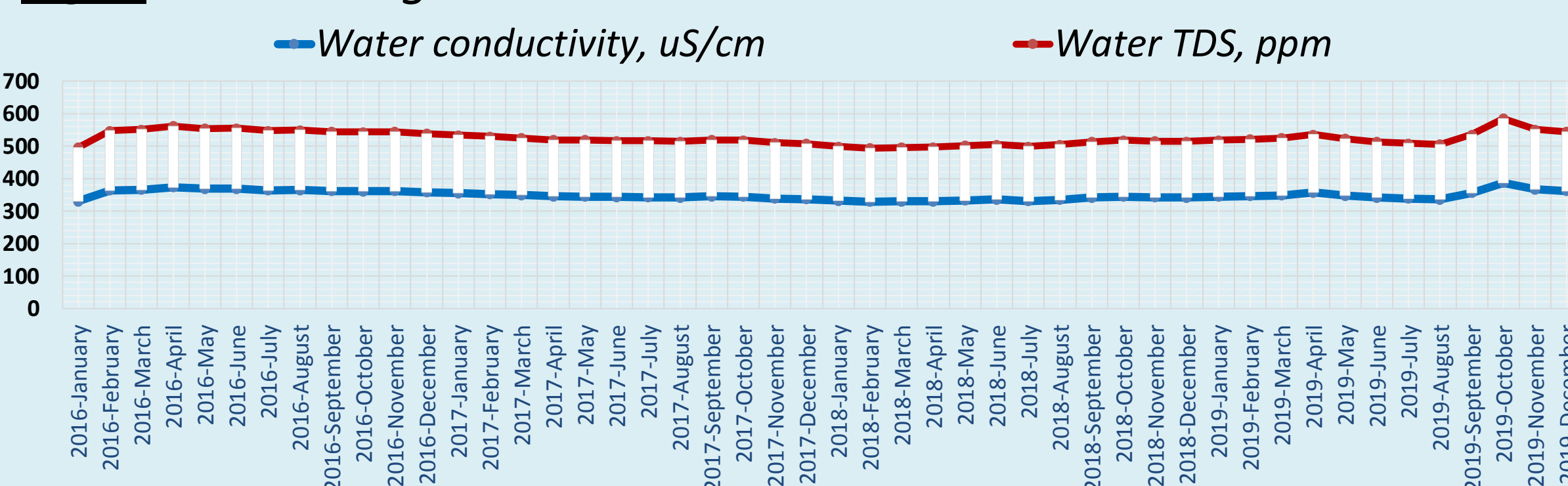
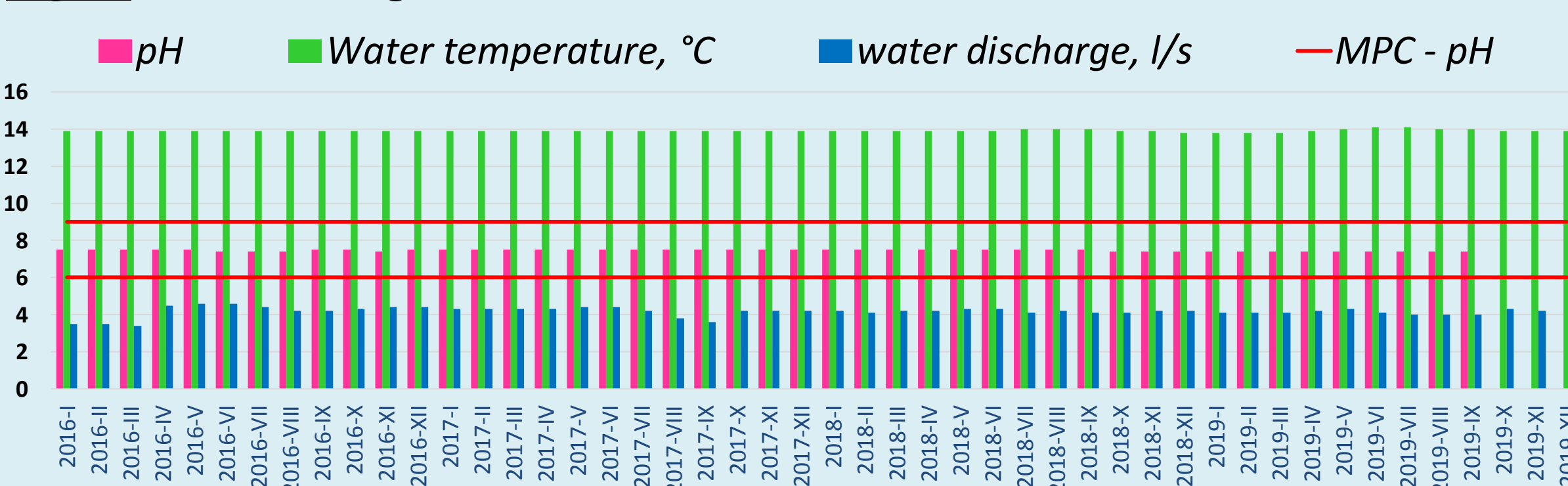


Fig. 4. Monitoring date - 01.01.2016-01.01.2020



The database on quantitative and qualitative characteristics of fresh groundwater of Georgia is being expanding based on information received online from water points, fieldwork results, laboratory analyzes and on the processing, analyzing and generalizing of the collected actual materials.

Groundwater monitoring results:

Fig. 5. Water temperature and pH values at monitoring stations of Alazani-Iori River Basin

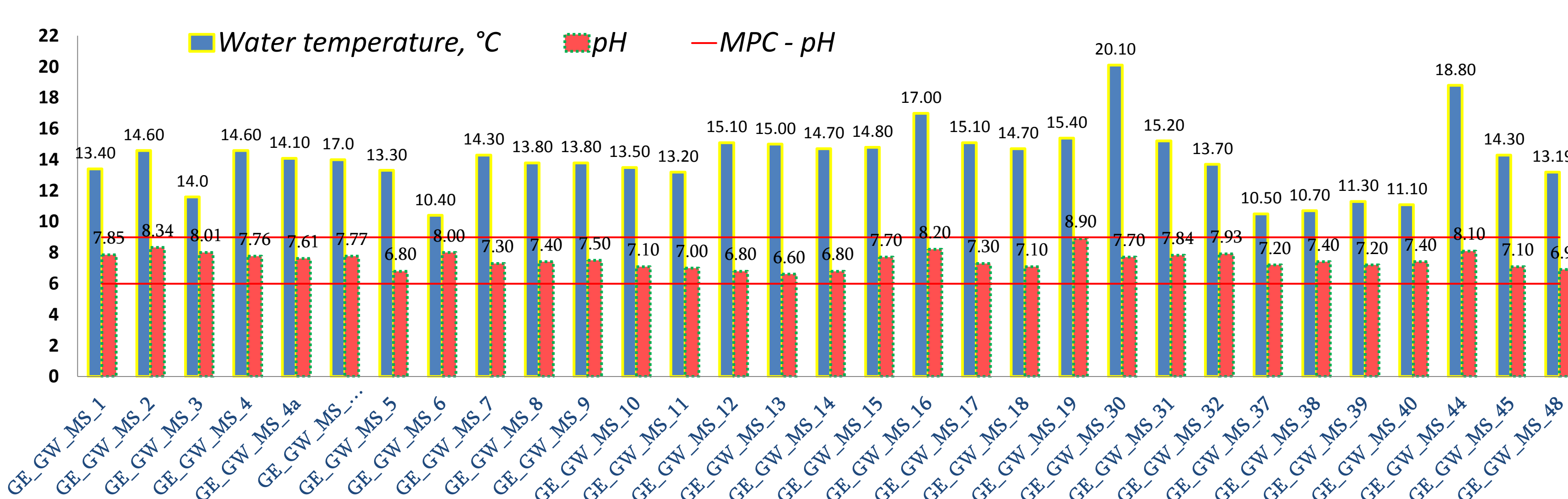


Fig. 6. Water conductivity and TDS values at monitoring stations of Alazani-Iori River Basin

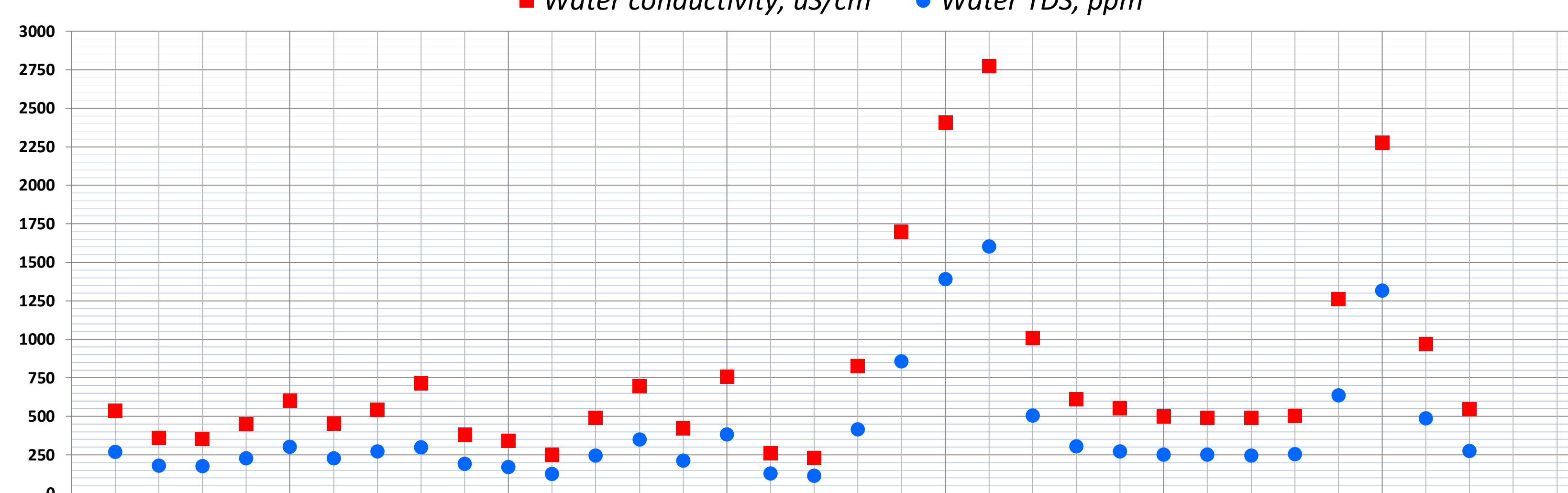
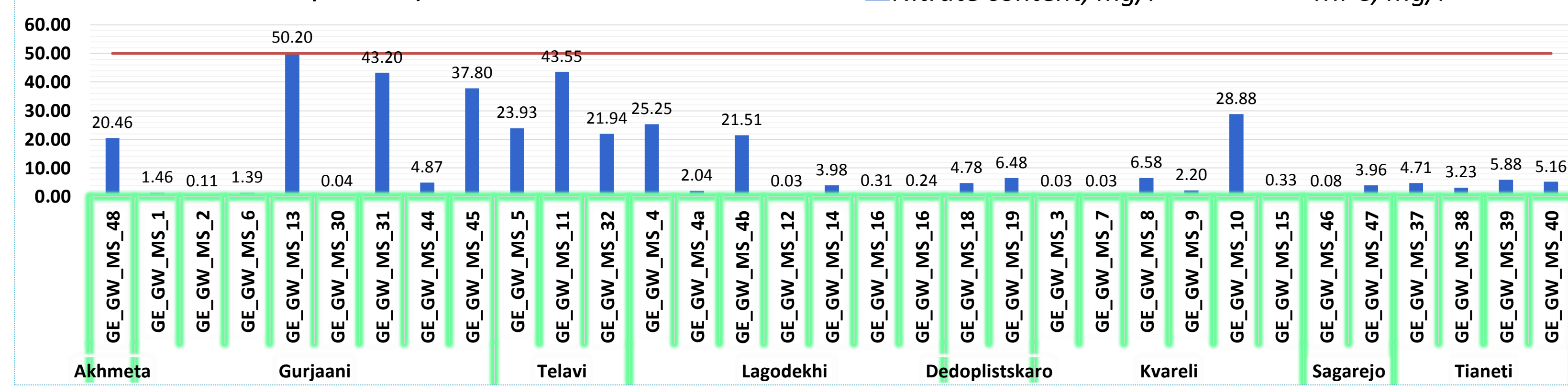


Fig. 7. Nitrate content at monitoring stations in the Alazani-Iori River Basin (According to individual municipalities)

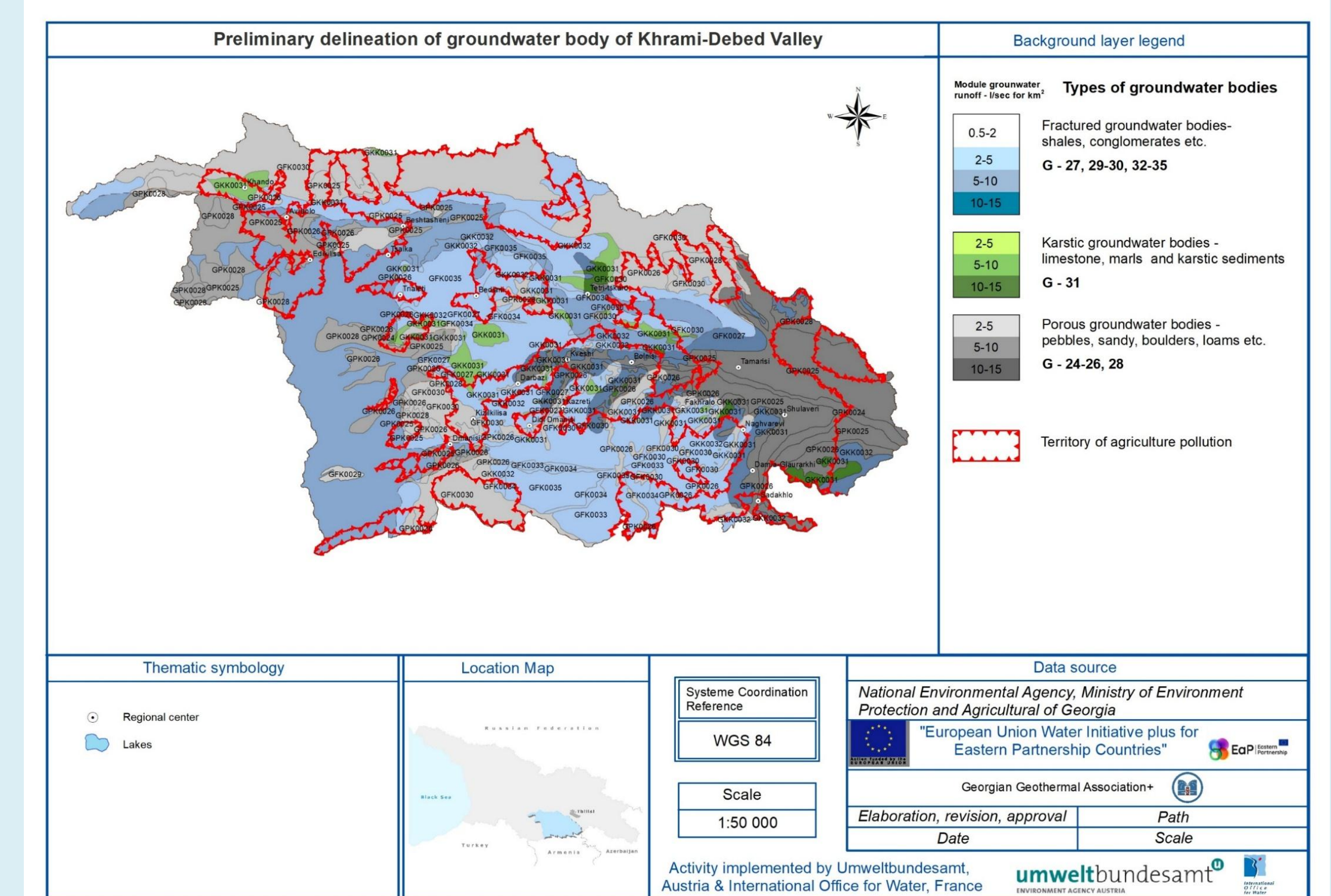
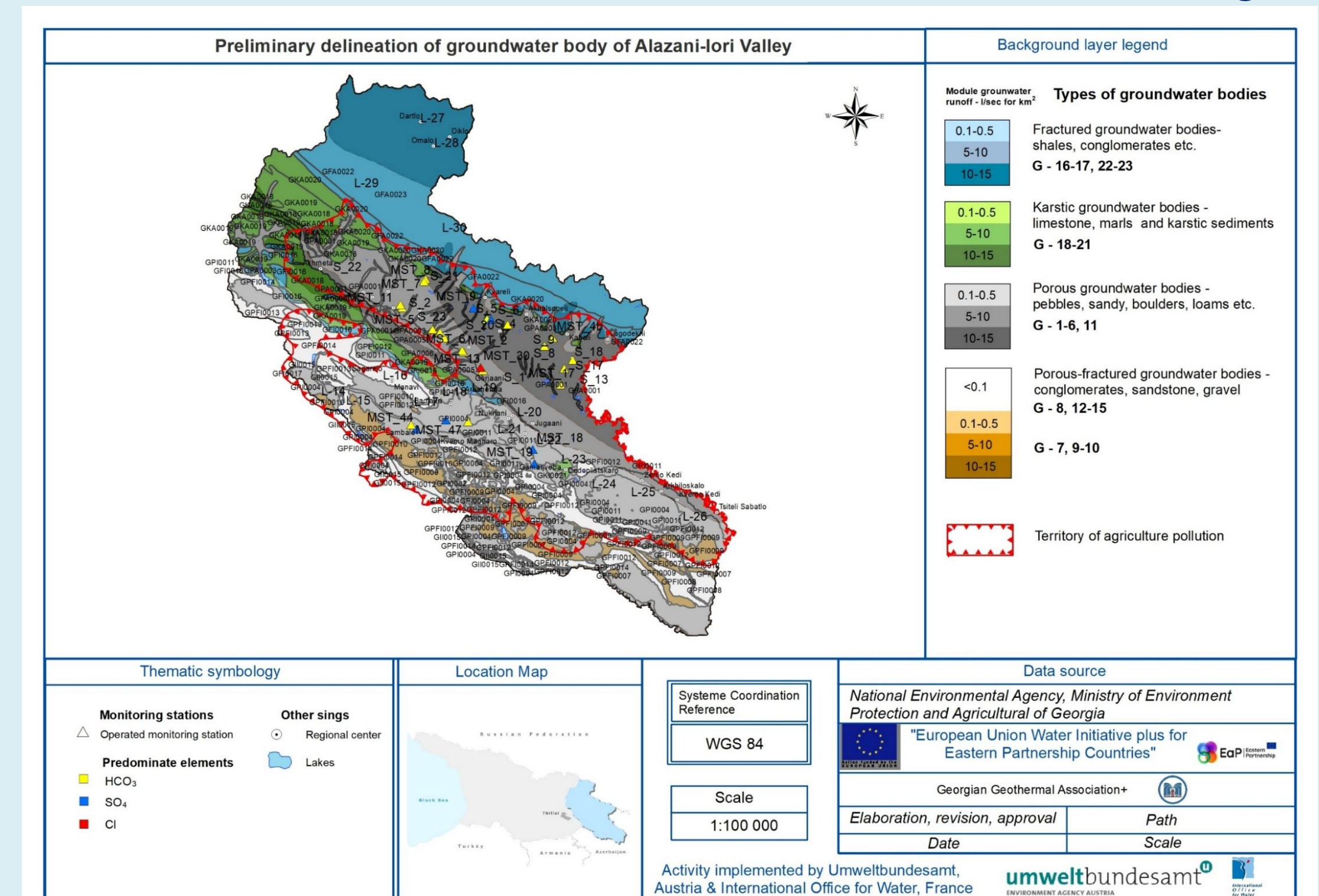


Conclusions / What are the challenges?

- The monitoring wells mostly are characterized by a stable regime (With slight variability);
- It is necessary to expand the monitoring network;
- An appropriate time series and many monitoring water points (wells, springs, household wells) will allow us to assess the status of groundwater bodies (according to WFD);
- The results are important in the process of implementation of integrated management of water resources, which should finally ensure sustainable management of water resources and reliable health protection of the population.

EUWI+ project results:

- Delineation and characterization of groundwater bodies in the Alazani-Iori and Khrami-Debeda River Basin Districts in Georgia;



- Geophysical studies (by the Geothermal Association of Georgia) have assessed the technical condition of the wells;
- Based on hydrogeological preliminary field works (by the NEA department of geology) it has been possible to characterize 9 different groundwater bodies.

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