River Rimava, Slovakia

Location

The River Rimava is located in southern part of the Slovak Republic. It is a tributary of the River Slana which flows into the River Tisza near Tiszaújváros in Hungary.

Catchment description

Relatively high differences in altitude are characteristic for the Rimava river catchment. The lowest point is 149 m a.s.l and highest point is 1439 m a. s. l. The northern part of the catchment belongs to middle highlands altitude level. Low highlands are typical for north and middle part of the area. South part of the catchment is predominantly categorised as lowlands altitude level. Lowlands shape 48% and low highlands 43% of the catchment territory. Only 9% of area belongs to the middle highland altitude level.

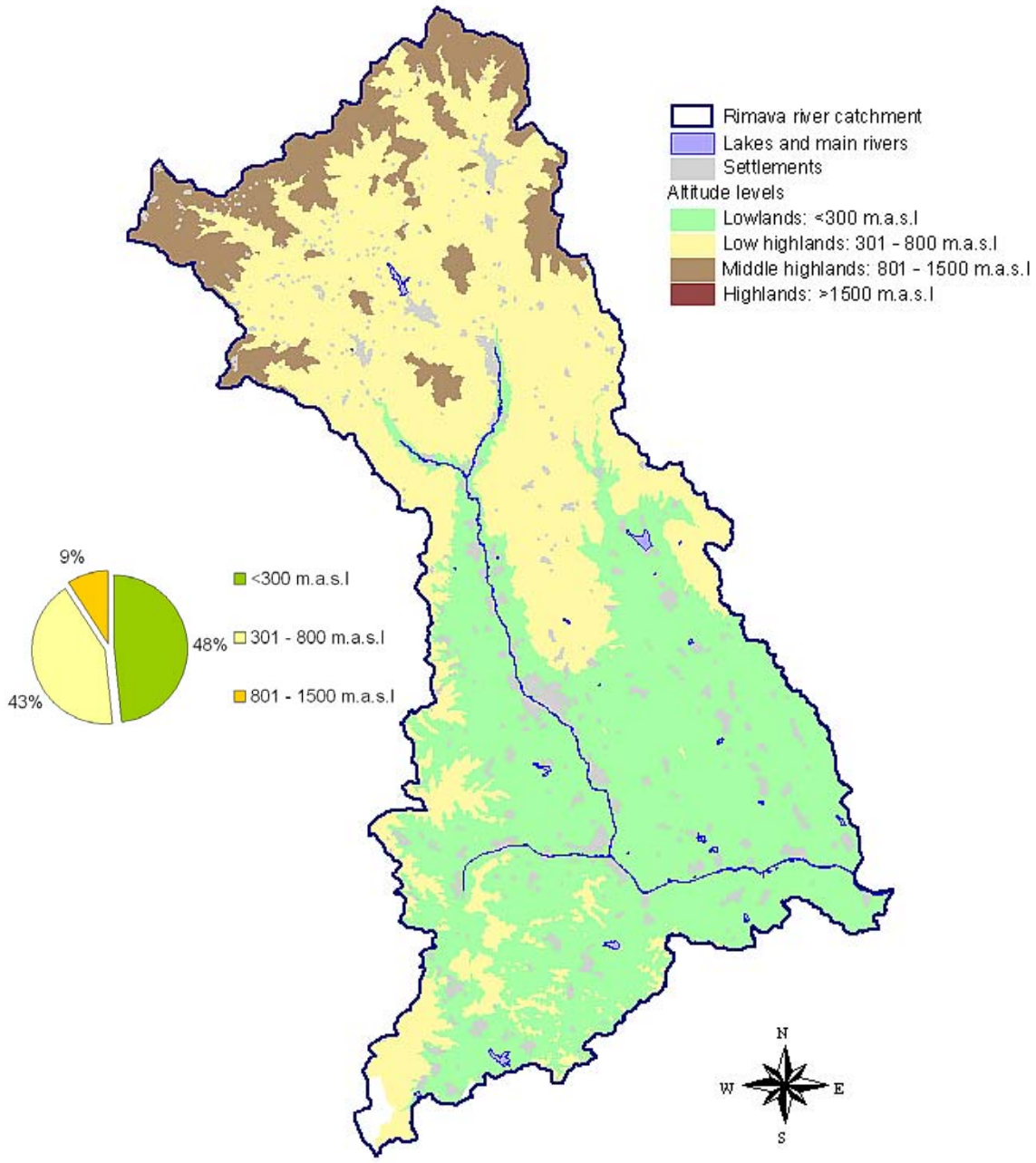

Figure. Altitude distribution in the Rimava River Catchment

More than 52% of the Rimava river catchment is used for agriculture. The agricultural activities are the most intensive in the bottom land of Rimava and its tributary Blh. Rimava river catchment is primarily rural catchment with scattered settlements. The largest town is Rimavská Sobota with approximately 25 000 habitants followed by Hnúšťa with approximately 7 500 habitants.

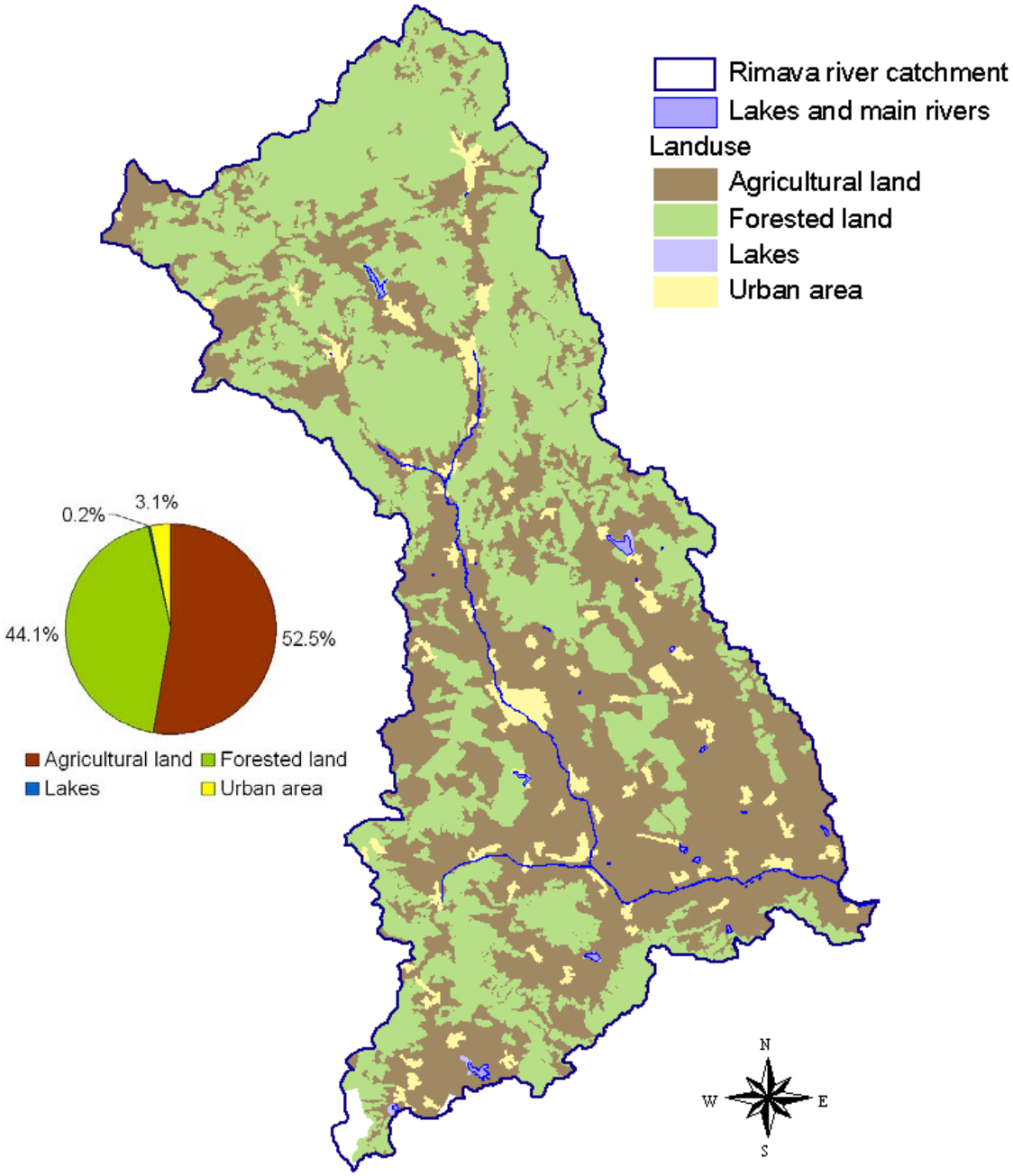

Figure. Rimava river catchment - Landuse

The northern part of the Rimava river catchment is built of a complex of crystalline schists and granitoids with fracture permeability. Groundwater circulation here is controlled by tectonic weathering fissures usually up to 50 meters deep. The rock complex has medium potential for accumulation of groundwater.

From point of view of spatial distribution, the most important rock complexes in the Rimava river catchment are Neogene sediments and Granitoids and Cristalline schists followed by Quaternary sediments.

Low transmisivity is typical for the complex of Palaeozoic rocks (conglomerates, arkoses, sandstones and schists). Groundwater circulation here is bounded by

tectonic weathering fissures. In general the complex of Palaeozoic rocks has poor potential for accumulation of groundwater

Good conditions for accumulation of groundwater are typical for Mesozoic carbonates (limestones and dolomites) with fissure permeability.

Similar to granitoids, also Neogene volcanics has middle potential for groundwater accumulation. Groundwater circulation here is controlled by tectonic weathering fissures.

Low transmisivity is typical also for sedimentary Neogene with fracture-intergranual permeability. The poor conditions for accumulation of groundwater are caused by presence of claystones in the rock complex.

Sands and gravels of the Quaternary sediments usually form the most important sources of groundwater in the Slovak territory.

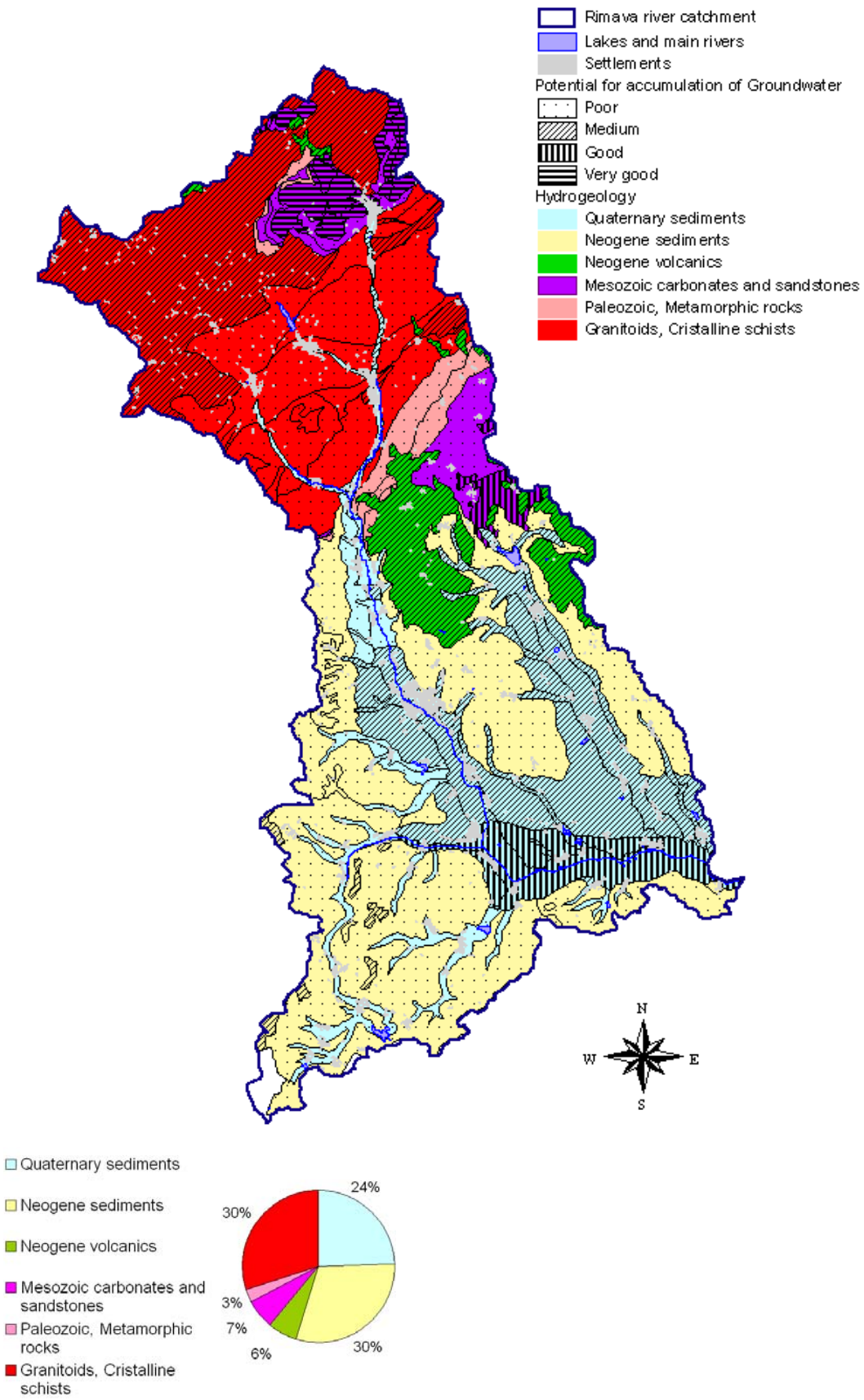

Figure. Rimava River Catchment - Hydrogeology

Key descriptors:

Catchment Area (station Vlkyňa)	1377.41 km^2
Level of Station	150.77 m a. s. l.
Maximum Altitude	1439 m a. s. l.
Mean flow	6.658 m^3s^{-1}
97.2% exceedance (Q97.2)	0.966 m^3s^{-1}
95% exceedance (Q95)	1.143 m^3s^{-1}
10% exceedance (Q10)	15.098 m^3s^{-1}
1961-2000 Average Annual Rainfall	668 mm

Hydrological summary

River Rimava and its tributaries have relatively natural hydrological cycle. There is reservoir Klenovec for public water supply and reservoir Teplý Vrch designed for agricultural water supply. Use of the water resources (both surface water and groundwater) does not significantly alter overall hydrological conditions.

The highest flow peaks in the basin occurred in October 1974, the driest year was in 1993.

In general the highest flow within the hydrological year is recorded in April and May and the lowest flow in August and September.

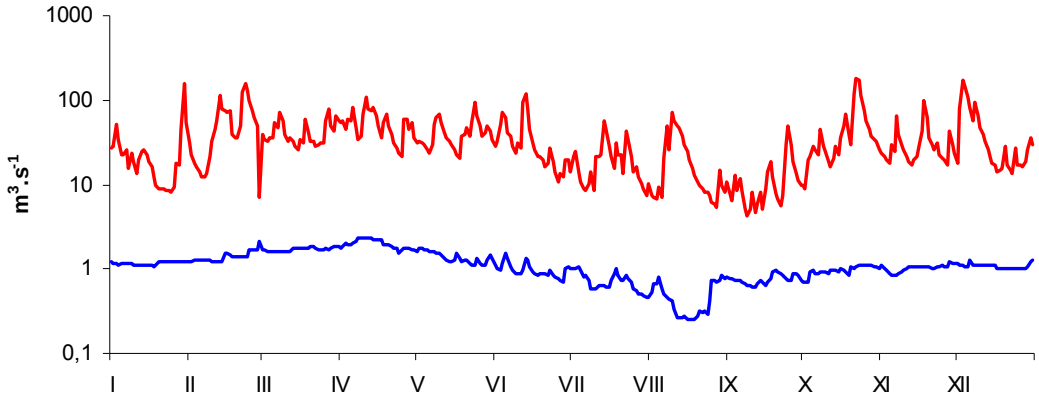

Figure. Max. and min. daily mean flows from 1973 to 2008 (station Vlkyňa)

Facilities and data availability

Rainfall

Rainfall was monitored in 18 monitoring sites in 2008 (see figure below). The measurement is performed by daily rain gauges. Four localities (Rimavská Sobota, Lom nad Rimavicou, Kokava nad Rimavicou and Čiž) are equipped by ombrograph. Localities Rimavská Sobota and Lom nad Rimavicou serve also as meteorological stations. Rainfall is measured from 1981. There is no plan to make significant changes in monitoring network in the near future. The monitoring is coordinated and executed by Slovak Hydrometeorological Institute.

Chemical composition of snowpack

Chemical composition of the snowpack is monitored since 1976 in one locality in the Rimava river catchment (Hajnačka). In situ parameters, basic anions, cations and trace elements are monitored once per year during the winter (typically January or February). The monitoring is coordinated and executed by the Geological Institute of Dionysus Stur. Selected results of the monitoring are available on the address http://dionysos.gssr.sk/cmsgf/cmsgf_databaza.html.

Quantity of surface water

Flow data are measured at the catchment outlet and at a network of additional stations. Twelve monitoring sites were located in Rimava river catchment in 2008 (see figure below).

There are more than 20 years data available from each monitoring site. The longest time series of data are available from locality Lehota nad Rimavicou where the monitoring is continuously performed from 1931. There is no plan to make significant changes in the monitoring network in the near future. The monitoring is coordinated and executed by the Slovak Hydrometeorological Institute.

Selected data can be downloaded from http://www.shmu.sk/sk/?page=25.

Quality of surface water

Surface water quality was monitored in twelve monitoring sites in 2008 (see figure below). Surface water monitoring was divided into the following subsystems:

Surveillance monitoring:

- water body in category “River” – 1 sampling site,
- water body in category “Lake” – 3 sampling sites,
- reference localities – 3 sampling sites;

Operational monitoring – 5 sampling sites.

Measured parameters differ based on the monitoring goals. In the frame of the surveillance monitoring are monitored all quality elements required by the Water Framework Directive (WFD). Exceptions from that rule were made in the case of reference localities, where the monitoring is focused on selected biological quality elements and supporting physico-chemical quality elements.

Operational monitoring is focussed on the problematic water management issues identified as relevant for individual water body. Quality elements are selected based on results of risk analysis performed according to article 5 of WFD.

Surface water quality monitoring network was significantly reorganized in 2007 in order to fulfil requirements of WFD. The monitoring network is still adjusted based on new results obtained from monitoring and also based on measures formulated in the River Basin Management Plan.

Surface water quality monitoring is coordinated by the Slovak Hydrometeorological institute and executed by Water Research Institute and State Water Management Company.

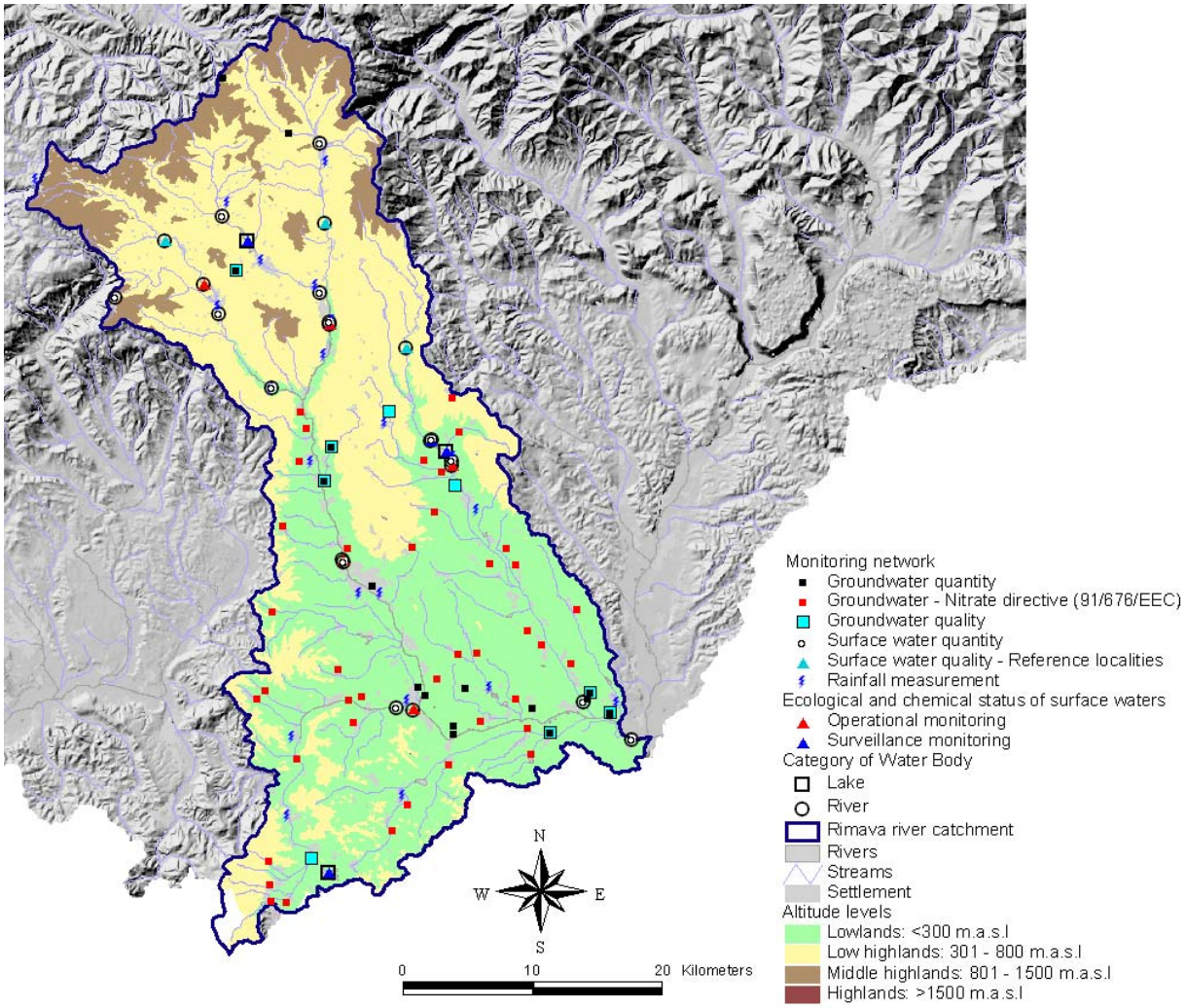

Figure. Monitoring in Rimava River Catchment - 2008

Monitoring of stream sediments

Stream sediments are monitored in one locality located in the Rimava river catchment (Rimavské Jánovce) since 1996. Following parameters are monitored: Na, K, Mg, Ca, Sr, Mn, Fe, Al, Zn, Cu, Si, Ti, Pb, Cd, As, Sb, V, Se, S, Ni, Co, Hg. The monitoring is coordinated and executed by the Geological Institute of Dionysus Stur. Selected results of the monitoring are available on the address http://dionysos.gssr.sk/cmsgf/cmsgf_databaza.html.

Groundwater quantity

Groundwater quantity was monitored in 17 monitoring sites in 2008. Monitoring is performed in wells (13 monitoring sites) and springs (4 monitoring sites). Groundwater level is monitored in all wells and discharge is monitored in all springs. In selected monitoring sites, the water temperature is monitored. There is no plan to make significant changes in the monitoring network in the near future. The monitoring is coordinated and executed by the Slovak Hydrometeorological Institute.

Groundwater quality

In 2008, monitoring of chemical status of groundwater was performed in nine monitoring sites from which four sites were monitored in the frame of surveillance monitoring and five in the frame of operational monitoring (see figure above). In each

sampling site are monitored in situ parameters (temperature, oxygen, conductivity, pH, colour, odour, ANC), basic physico-chemical determinands (Na, K, Ca, Mg, Mn, Fe, NH_4, NO_2, NO_3, Cl, SO_4, PO_4, SiO_2, CO_3, HCO_3 COD-Mn, CO_2, Dissolved Solids, H_2S, TOC) and trace elements (As, Cd, Pb, Hg, Sb, Se, Zn, Al). This core group of determinands is from site to site supplemented by those determinands which reflect anthropogenic activities with possible adverse effect to the chemical status of groundwater (e.g. industry, application of agrochemicals etc.)

Frequency of monitoring depends on the hydrogeologic conditions. Carbonates are monitored 4 times per year, quaternary sediments 2 times per year and others once per year.

Also a groundwater quality monitoring network was reorganized in 2007 in order to fulfil requirements of WFD. The monitoring network is still adjusted based on new results obtained from monitoring and also based on measures formulated in the River Basin Management Plan. The monitoring is coordinated by the Slovak Hydrometeorological Institute and executed by the Slovak Hydrometeorological Institute. Chemical analyses are carried out by laboratory of Geological Institute of Dionysus Stur.

In addition, operational monitoring network is done at 40 sampling sites located in zones vulnerable to nitrate (see figure above). The monitoring was established in 2008 in order to fulfil requirements of the Nitrate directive 91/676/EEC. Samples are taken from shallow monitoring wells. In each sampling site are measured NH_4, NO_2 and NO_3, once per year. The monitoring is coordinated and executed by the Water Research Institute.

Institutional support

The main role in the monitoring of water in the Slovak Republic has Slovak Hydrometeorological Institute. Management of the institute declares support to EURAQUA activities.

Value to Network

The Rimava Observatory provides data for hydrological conditions that are common in its region but which are quite different from those monitored by many other observatories in the network. Some important distinguishing features of the Rimava catchment in the European context are the large elevation differences, the almost natural flow regime, and the long time series

Contact for further information

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