STATE OF THE ENVIRONMENT REPORT – SLOVAK REPUBLIC

2018

25th anniversary of annual reports

MINISTRY
OF ENVIRONMENT
OF THE SLOVAK REPUBLIC

SLOVAK
ENVIRONMENT
AGENCY

WATER

KEY QUESTIONS AND KEY FINDINGS

What is the status and trend in the use of water from the perspective of conserving water resources?

The percentage of total abstraction from outflow from the territory of the SR after 2000 did not even reach 10%, with the exception of 2002 to 2004.

Surface water abstraction after 1995 showed a significant fall, despite minimal year-on-year increases and decreases. In 2018 abstraction had fallen by 71% compared to 1995 and, compared to 2005, by 56.0%. Abstraction decreased year-on-year by 4.0% between 2017 and 2018.

Groundwater abstraction also recorded a decrease after 1995, however since 2005 it has shown a balanced character with minimal year-on-year increases and decreases. In 2018 abstraction had decreased by 41.4% compared to 1995 and by 9.5% compared to 2005. There was a year-on-year increase of 1.31%.

Is surface water pollution caused by waste water discharge decreasing?

Since 1995 the volume of waste water discharged into surface water has been decreasing despite year-on-year fluctuations. In 2018 waste water generation had decreased compared to 1995 by 48.9%, by 32.3% compared to 2005 and by 2.4% compared to 2017. In 2018 the amount of pollution characterised by the BOD_5, COD_{Cr} and P_{total} parameters decreased, while N_{total} was at approximately at the same level as the year before.

In 1993 51.5% of the population was connected to a public sewerage system, while this had increased to 56.7% in 2005 and the figure was 68.40% in 2018.

Are the requirements for surface water quality being met?

Groundwater quality at all monitored sites complied with the limits for selected general indicators and radioactivity indicators in 2018. Limits were exceeded primarily for synthetic and non-synthetic substances, hydrobiological and microbiological indicators and for general indicators, primarily nitrite.

Pursuant to the requirements of the framework water directive, water quality is expressed through the ecological and chemical status of surface water bodies. A bad and very bad ecological status of surface water bodies was recorded in 8.94% of the total number of water bodies, which is 2,159.41 km long. 37 surface water bodies (2.4%) did not achieve good chemical status.

Are groundwater quality requirements being met?

Surveillance monitoring and operational monitoring identified cases where established groundwater pollution limits were exceeded in 2018.

There were 11 groundwater bodies in a bad chemical status (14%).

What is the quality of drinking water?

Slovakia has enjoyed a high level of drinking water quality for a long period of time. In 2018 the share of drinking water analyses meeting the limits reached 99.75%, while in 2000 it was 98.64%.

The number of inhabitants supplied through the public water supply reached 89.25% in 2018. In 1993, this figure was 4 138 000 (77.8%) and in 2005 it was already 4 605 000 inhabitants (85.4%).

What is the water quality at natural bathing pools?

The classification of bathing waters within the meaning of Directive 2006/7/EC was performed at 32 natural sites. 18 bathing localities were classified as having excellent bathing water quality, 9 localities had good bathing water quality, one locality was adequate and one inadequate. During the bathing season, the limit value for the intestinal enterococcus indicator was exceeded at the Ružín locality in the Košice district.

REVIEW OF WATER RESOURCES

Water balance

The annual inflow into the SR was 53 795 million m³ in 2018, 7 304 million m³ less than in 2017. **Outflow** from the territory fell compared to the preceding year by 8 702 million m³, while the decrease in the outflow from the SR was 2 203 million m³.

Total water reserves in storage reservoirs as of 1 January 2018 was 1 032.66 million m³, or 89.01% of the exploitable volume of water in the storage reservoirs. As of 1 January 2019 the total exploitable volume of the assessed storage reservoirs compared to 1 January 2018 fell to 726.4 million m³, or 63% of the exploitable volume of water.

Table 003 I Overall water balance of water resources

	Volume (million m³)		
	1996	**2000**	**2018**
Hydrological balance			
Precipitation	41 127	37 500	32 286
Annual inflow to the SR	65 465	77 999	53 795
Annual outflow	79 996	90 629	65 075
Annual outflow from Slovak territory	12 842	12 842	8 823
Water management balance			
Total abstraction in the SR	1 336,80	1 172	573.26
Evaporation from reservoirs	46.89	60.00	58.48
Release into surface water	1 160.31	989.80	599.60
Impact of reservoirs	144.87	32.98	306.40
	Accumulation	**Augmentation**	**Augmentation**
Total reserves in reservoirs as of 1 January of the following year	857.3	757.0	726.4
% of storage volume in accumulation reservoirs in the SR	69	65	63
% of total abstraction from the outflow from Slovak territory	10.4	9.1	6.5

Source: Slovak Hydrometeorological Institute

SURFACE WATER

Precipitation and runoff conditions

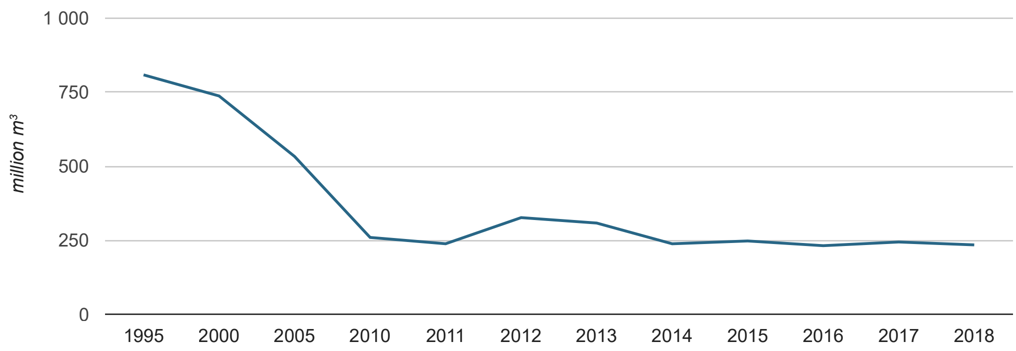
Total precipitation in the SR reached 673 mm in 2018, or 88% of the normal, and the year was assessed as dry in terms of precipitation.

The annual outflow quantity reached 77% of the long-term average in the SR. The values for the outflow quantity in river basins was between 57% and 92% of normal.

Surface water use

In 2018 total abstraction of surface water decreased by 4.0% compared to the preceding year. Abstraction for industry recorded a decrease of 2.5%, while a decrease of 1.2% was recorded for the abstraction of surface water for the public water supply. The abstraction of surface water for irrigation decreased to 12.95 million m³, a decrease of 26.5%.

Chart 015 I Trend in the abstraction of surface water



Source: Slovak Hydrometeorological Institute

Table 004 I Use of surface water (million m³)

Year	Public water supply	Industry	Irrigation	Other agriculture	Total abstraction	Discharge
1995	71.963	661.836	74.325	0.0360	808.159	1 1120.290
2005	53.828	467.957	11.006	0.0110	532.791	871.865
2018	46.940	174.470	12.950	0.0200	234.380	599.600

Source: Slovak Hydrometeorological Institute

Assessment of surface water quality

Surface water quality at all monitored sites complied with the limits for selected general and radioactivity indicators in 2018. The most cases where limit values for general indicators were exceeded (Part A of the Government Regulation) were for the nitrite indicator in all parts of river basins. Surface water quality requirements for synthetic and non-synthetic substances (Part B and C of the Government Regulation) were not met for the indicators As, Zn, Cu, Cr, total cyanides, 4-metyl-2.6-di-terc butylfenol and PCB and its congeners. The annual average of the environmental quality standard (EQS) was exceeded for Cd, Ni, Pb, di (2-ethylhexyl) phthalate (DEHP), fluoranthene, pentachlorophenol, and 4-tert-octylphenol. Of the group of hydrobiological and microbiological indicators (Part E), the following parameters were not met: the saprobic index of biosestone, phytoplankton abundance, chlorophyll a, coliforms, thermotolerant coliforms, intestinal enterococci and cultured microorganisms at 22°C.

Table 005 I Number of monitored sites and indicators not meeting general surface water quality requirements for indicators A and E (2018)

International river basin	Sub-basin	Number of monitored sites in the sub-basin		Indicators that do not meet surface water quality requirements pursuant to Annex No 1	
		monitored	not meeting requirements	general indicators (A)	hydrobiological and microbiological indicators (E)
Danube	Morava	53	36	O_2,COD_{Cr},BOD_5,EC (conductivity),pH,N-NH_4,N-NO_2,N-NO_3, N_{total}, P_{total}, Ca,Al, AOX	abundance of phytoplankton, chlorophyll a, saprobic index of biosestone, cultivable microorganisms at 22°C
Danube	Danube	20	15	O_2, EC (conductivity),pH,N-NH_4,N-NO_2,N-NO_3, N_{total}, Ca, AOX	coliform bacteria, enteric cocci, cultivable microorganisms at 22°C
Danube	Váh	179	148	O_2, BOD_5, COD_{Cr}, pH, EC (conductivity), N-NH_4, N-NO_2, N-NO_3, P_{total}, Fe, Mn, V, FN, N_{total}, Norg., Cl-, SO_4^{2-}, Ca, AOX, Al, DS_{105}, DS_{550}, F^-, TOC	abundance of phytoplankton, enteric cocci, thermotolerant coliform bacteria, saprobic index of biosestone, coliform bacteria, cultivable microorganisms at 22°C
Danube	Hron	47	30	O_2, BOD_5,COD_{Cr}, pH, EC (conductivity),N-NO_2,N-NO_3, N-NH_4, N_{total}, P_{total}, Ca, AOX	saprobic index of biosestone, chlorophyll a, cultivable microorganisms at 22°C
Danube	Ipeľ	33	25	O_2,COD_{Cr}, EC (conductivity), N-NH_4,N-NO_2, N-NO_3, N_{total}, P_{total}, Ca, AOX	cultivable microorganisms at 22°C
Danube	Slaná	15	9	O_2, COD_{Cr}, pH, EC (conductivity), N-NO_2, N-NO_3, N-NH_4, N_{total},P_{total}, Ca,AOX	coliform bacteria, enteric cocci, thermotolerant coliform bacteria, cultivable microorganisms at 22˚C
Danube	Bodrog	49	47	O_2, BOD_5, COD_{Cr}, EC (conductivity), N-NH_4, N-NO_2, N-NO_3, N_{total}, P_{total}, Ca, AOX, NPE_{UV}	abundance of phytoplankton, saprobic index of biosestone, thermotolerant coliform bacteria, enteric cocci, coliform bacteria, cultivable microorganisms at 22°C
Danube	Hornád	32	26	O_2, BOD_5, COD_{Cr}, EC (conductivity), Ca, N-NH_4, N-NO_2, N-NO_3, N_{total}, P_{total}, SO_4^{2-}, AOX, F^-, Al, NPE_{UV}	saprobic index of biosestone, abundance of phytoplankton, enteric cocci, thermotolerant coliform bacteria, coliform bacteria, cultivable microorganisms at 22°C
Danube	Bodva	10	9	O_2,COD_{Cr},EC (conductivity), N-NO_2, N-NO_3, N-NH_4, N_{total}, P_{total}, Ca, AOX, NPE_{UV}	enteric cocci, coliform bacteria, thermotolerant coliform bacteria, cultivable microorganisms at 22°C
Visla	Dunajec and Poprad	14	9	O_2, BOD_5, COD_{Cr},N-NH_4,N-NO_2, P_{total}, NPE_{UV}	coliform bacteria, thermotolerant coliform bacteria

Source: Slovak Hydrometeorological Institute

Table 006 I Indicators not meeting the general requirements for surface water quality for Indicators B and C (2018)

International river basin	Sub-basin	Indicators not meeting the general requirements for surface water quality pursuant to Annex No1	
		non-synthetic substances (B)	synthetic substances (C)
Danube	Morava	Ni (AA)	FLU (AA), CN (AA), 4-m-2.6-tBTP (AA), octylphenol (AA), B(a)P (AA) *, B(b)fluoranthene (AA)*, B(k) fluoranthene (AA)*, B(ghi)perylene (AA,MPC)*, Indenopyrene (AA)*, TBT (AA)*
Danube	Danube		B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Váh	As (AA),Cu (AA),Cr (AA)	FLU (AA), 4-m-2.6-tBTP (AA), Octylphenol (AA/AA*), B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k) fluoranthene (AA*), B(ghi)perylene (AA,MPC)*, Indenopyrene (AA*), TBT (AA*)
Danube	Hron	As (AA),Cu (AA),Zn (AA),Pb (AA)	PCP (AA*,MPC*), Octylphenol (AA*), TBT (AA*), FLU (AA,MPC), B(a)P (AA*), B(b)fluoranthene (AA*), B(ghi)perylene (AA*), Indenopyrene (AA*)
Danube	Ipeľ	Cd (AA,MPC),Pb (AA),Zn (AA)	FLU (AA), B(a)P (AA*), B(b)fluoranthene (AA*), B(k) fluoranthene (AA*), B(ghi)perylene (AA*), Indenopyrene (AA*)
Danube	Slaná	Pb (AA)	FLU (AA), B(a)P (AA*), B(b)fluoranthene (AA*), B(ghi) perylene (AA*), Indenopyrene (AA*)
Danube	Bodrog		DEHP (AA), FLU (AA), CN (AA), PCB (AA), TBT (AA)*, B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Hornád		CN (AA), Cybutryne (AA), TBT (AA)*, B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k)fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*
Danube	Bodva	As (AA)	B(a)P (AA)*, B(ghi)perylene (AA)*
Visla	Dunajec and Poprad		CN (AA), B(a)P (AA)*, B(b)fluoranthene (AA)*, B(k) fluoranthene (AA)*, B(ghi)perylene (AA)*, Indenopyrene (AA)*, TBT (AA*)

** potentially does not meet water quality requirements pursuant to Government Regulation of the SR No 269/2010 and Government Regulation of the SR No 167/2015 (< 12 measurements per year)*
AA – annual average exceeded
MPC - maximum permissible concentration exceeded

Source: Slovak Hydrometeorological Institute

Assessment of the status of surface water bodies

The assessment of the ecological status of surface water bodies, performed for the needs of the second river basin management plan currently in force, is based on the monitored 2009 to 2012 period and covers 1 510 surface water bodies.

Very good and good ecological status/potential was recorded in 56.2% of the total number of water bodies with a total length of 8 073.43 km. 34.8% of the water bodies, or a length of 7 565.46 km, were found to be in an average environmental status. Bad and very bad status was determined in around 9% of the water bodies with a length of 2 159.41 km.

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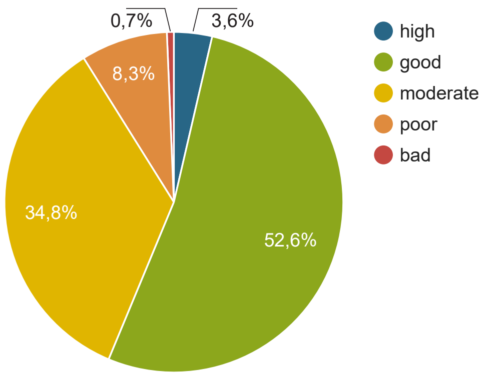
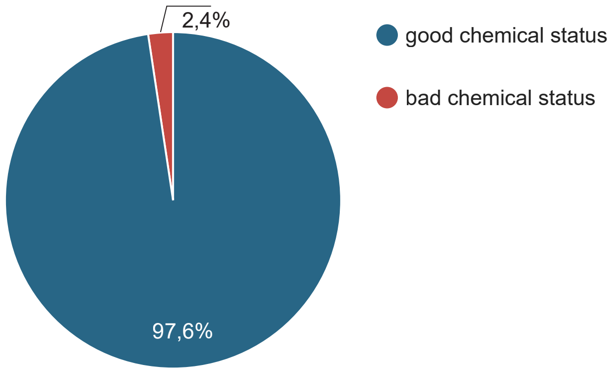
The assessment of the **chemical status** of surface water bodies in the 2009 to 2012 period was performed for 1 510 surface water bodies. Good chemical status was determined for 1 473 of the bodies (97.6%), while 37 (2.4%) surface water bodies did not achieve good chemical status.

Chart 016 I Ecological status/potential of surface water bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

Chart 017 I Chemical status of surface water bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

GROUNDWATER

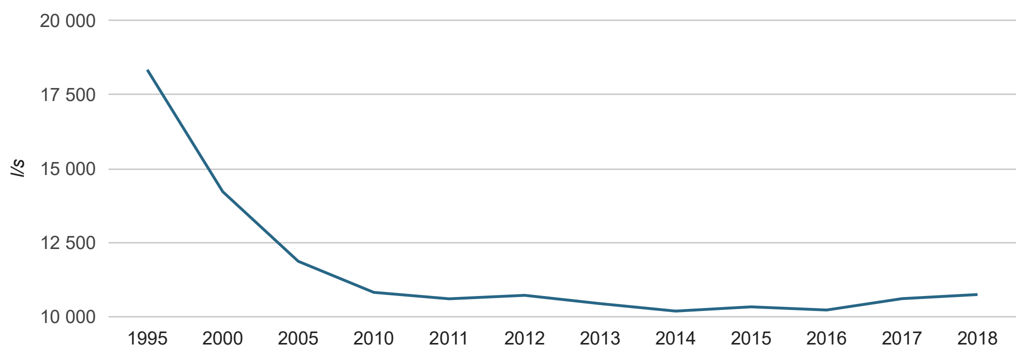
Water resources

In 2018 there was **77 117.8 l/s of exploitable groundwater** in the SR, a slight rise of 0.76% compared to the previous year. In a long-term assessment, there has been an increase in the exploitable amount compared to 1990 of 3.1%. The ratio of the exploitable amount of groundwater to abstracted amount was approximately at the level of 2017, and reached 7.17.

Use of groundwater

In 2018 10 745.8 l/s of groundwater was used on average, or 13.93% of the documented exploitable amount. During 2018 a groundwater abstraction increase of 1.31% compared to 2017 was recorded.

Chart 018 I Trend in the use of groundwater



Source: Slovak Hydrometeorological Institute

There was an increase in water consumption in the majority of industries with the exception of abstraction for public water supply purposes, social purposes, crop production and irrigation, where there was a decrease in the use of groundwater compared to 2017. Groundwater abstraction in the 'other use' category increased most, by 228.7 l/s.

Table 007 I Use of groundwater (l/s)

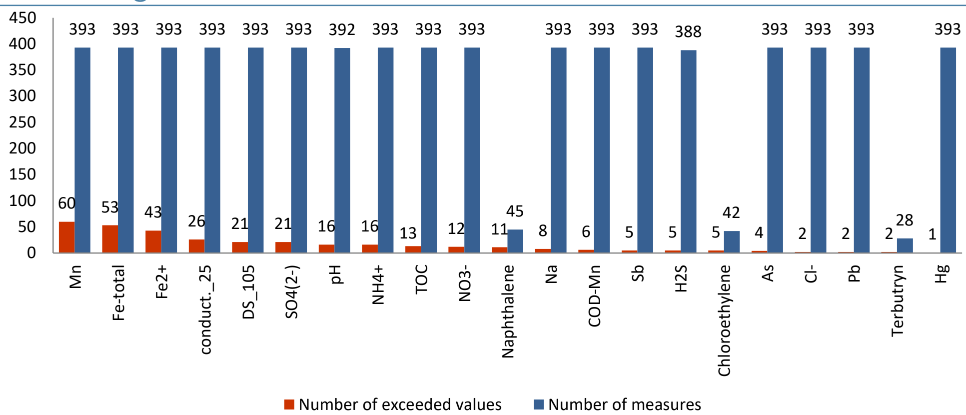
Year	Public water supply	Food industry	Other industry	Agricultural and animal production	Crop production and irrigation	Social purposes	Other uses	Total
1995	14 373.10	390.60	2 327.20	727.10	25.00	286.50	202.70	18 332.20
2005	9 159.87	288.25	856.75	308.82	95.07	279.72	878.98	11 867.46
2018	7 843.90	250.10	831.20	227.80	107.70	192.50	1 292.60	10 745.80

Source: Slovak Hydrometeorological Institute

Groundwater quality monitoring

Groundwater quality is monitored in 176 surveillance monitoring sites. These are sites of the Slovak Hydrometeorological Institute monitoring network or springs not affected by point sources of pollution.

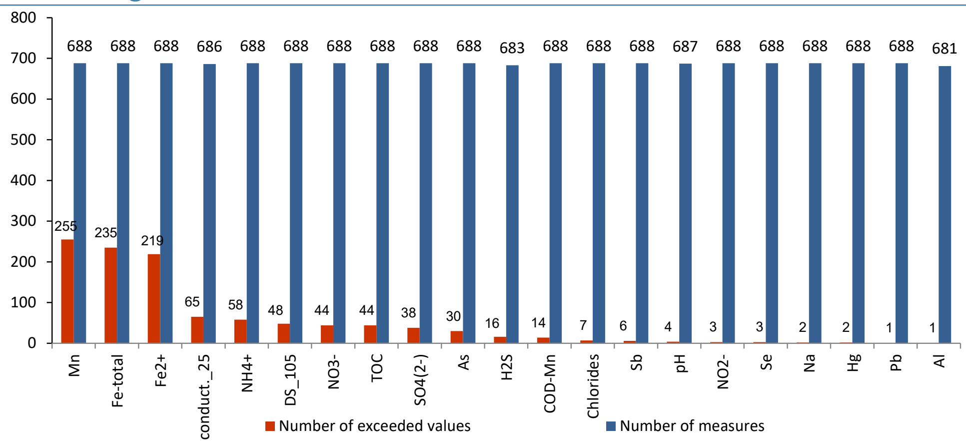
Chart 019 I Frequency of exceeded selected groundwater quality indicators in surveillance monitoring sites (2018)



Source: Slovak Hydrometeorological Institute

Operational monitoring was carried out in all groundwater bodies assessed as threatened from the perspective of failure to achieve good chemical status. 220 sites supposed to detect any penetration of pollution into groundwater from a potential source of pollution or a group of them, were monitored.

Chart 020 I Frequency of exceeded selected groundwater quality indicators in operational monitoring sites (2018)



Source: Slovak Hydrometeorological Institute

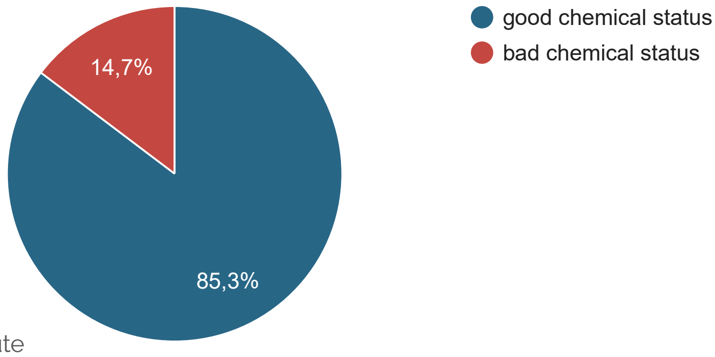
Assessment of the status of groundwater bodies

An assessment of the status of groundwater bodies was carried out for the needs of the second river basin management plan in force and is based on the 2009 to 2012 reference period.

Of the total number of 75 groundwater bodies, the following were assessed:

- 11 groundwater bodies in bad chemical status - 7 quaternary and 4 pre-quaternary
- 64 groundwater bodies in good chemical status

Chart 021 I Chemical status of groundwater bodies assessed as part of the second cycle of river basin management plans in force for the 2016 to 2021 period (Share of the quantity)



Source: Water Research Institute

Good chemical status was indicated for 85.3% of the groundwater bodies, or a surface area of 46 507 km² (77.9% of the total area of the bodies). Bad status was indicated in 14.7% of the groundwater bodies, or an area of 13 215 km² (22.1% of the total area of the bodies).

In the SR 3 groundwater bodies were assessed as in bad quantitative status.

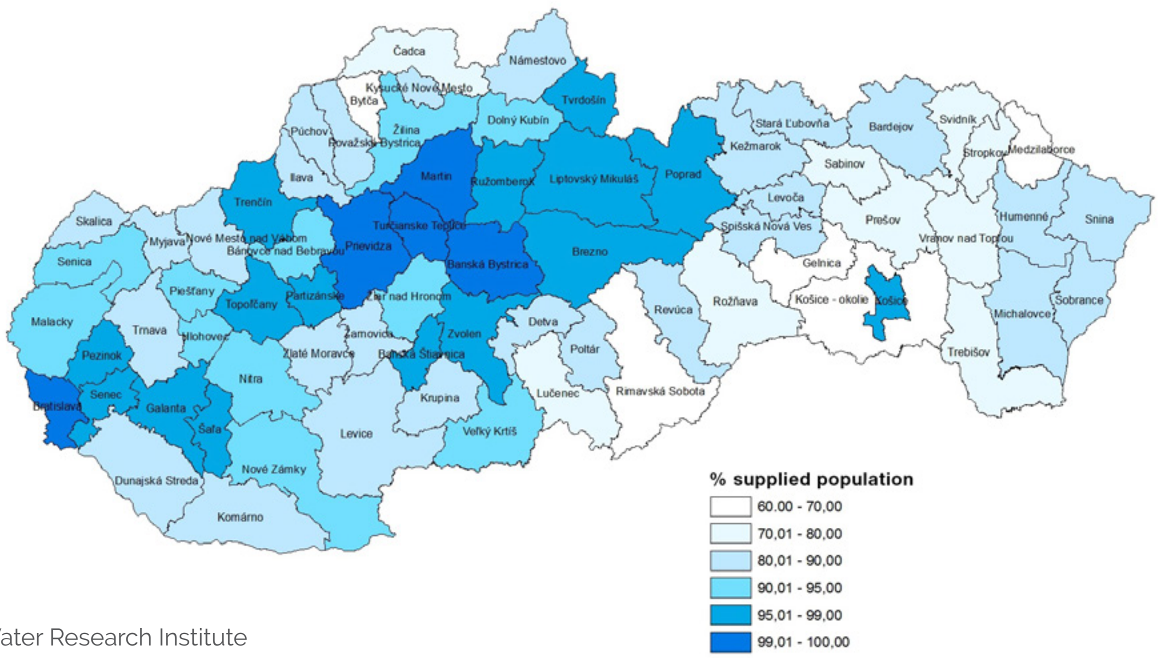
SUPPLYING THE POPULATION WITH DRINKING WATER

Supplying the population with water from the public water supply system

The number of inhabitants supplied with water from the public water supply system in 2018 reached 4 859 940, or 89.25% of the total population. In 2018 there were 2 416 independent municipalities in the SR supplied with drinking water from the public water supply system and their share of the total number of municipalities in the SR was 83.60%.

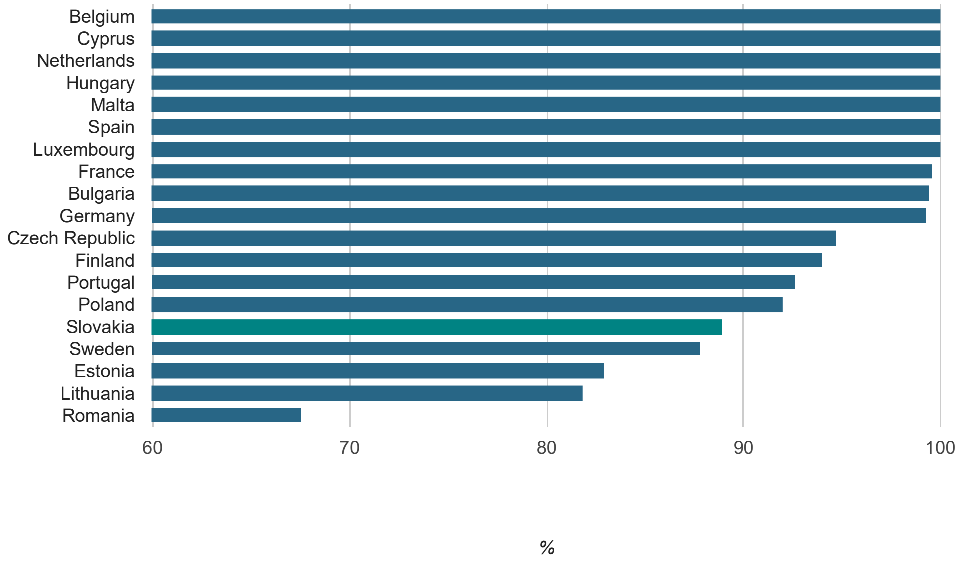
The quantity of drinking water generated reached 291.77 million m³, which was approximately at the level of 2017. Of the total water produced in water management facilities, water losses in the pipeline network were 24.1% in 2018. Specific water consumption in households slightly increased to 77.97 l/person/day.

Map 006 I Share of inhabitants supplied from the public water supply system (2018)



Source: Water Research Institute

Chart 022 I International comparison of population connected to the public water supply system (2017)



Source: Eurostat

Monitoring and assessment of drinking water quality

Indicators for drinking water quality are defined through Decree of the Ministry of Health of the SR No 247/2017, which determines details about drinking water quality, drinking water quality control, and the programme for the monitoring and management of risks relating to the drinking water supply. In addition to a complete analysis of the water, for control and acquisition of regular information about the stability of the water source and the effectiveness of the water treatment, in particular disinfection, about the biological quality and sensory properties of drinking water, a minimum analysis – meaning an examination of 26 water quality and free chlorine, respectively chlorine dioxide, indicators – is performed.

In 2018, 18 942 samples of drinking water were analysed in the operational laboratories of water companies through 486 666 analyses for individual drinking water indicators. The percentage of drinking water analyses meeting hygiene limits reached 99.75% in 2018. The percentage of samples complying with all drinking water quality indicators reached 95.45%. These percentages do not include free chlorine indicators.

The disinfection of drinking water is primarily carried out using the chemical process of chlorination. Decree of the Ministry of Health of the SR No 247/2017 determines a limit value of 0.3 mg/l for the content of free chlorine in drinking water. If water is disinfected using chlorine, the minimum value of free chlorine in the distribution network need not be 0.05 mg/l.

The percentage of analyses that did not comply with Decree of the Ministry of Health of the SR No 247/2017 due their exceeding the 0.3 mg/l value was 1.85% in 2018. The requirement of Decree of the Ministry of Health of the SR No 247/2017 for the minimum content of free chlorine (0.05 mg/l) was not complied with by 12.42% of drinking water samples.

WASTE WATER REMOVAL AND TREATMENT

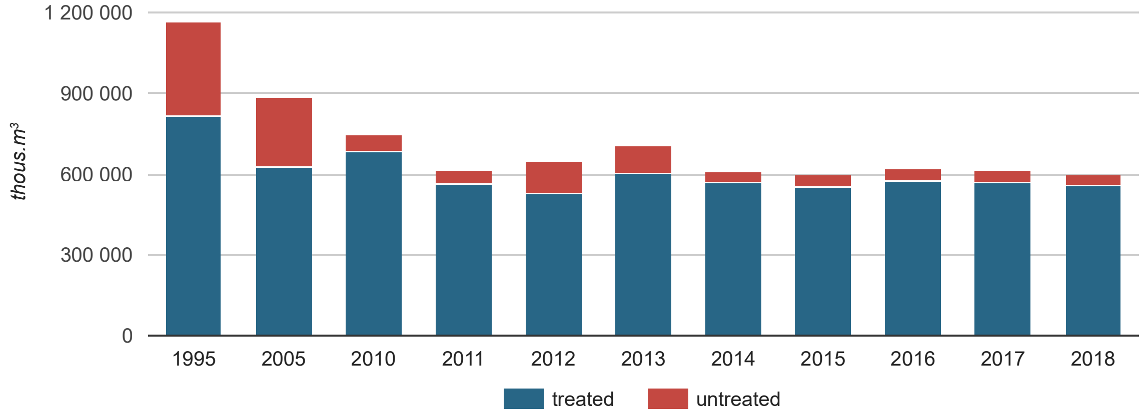
Waste water generation

In 2018 the total quantity of **waste water** discharged into surface water was 597 133 000 m^3 which, compared to the preceding year, was a decrease of 2.4%, while compared to 2005 it was a decrease of 32.3%.

Compared to the preceding year a decrease was recorded in the indicators for the contamination of waste water – chemical consumption of oxygen dichromate (COD_{Cr}) of 933 t/year, biological oxygen demand (BOD_5) of 289 t/year and total phosphorus (P_{total}) of 11 t/year. Total nitrogen (N_{total}) and insoluble substances (IS) were approximately at the level of 2017 and there was only an increase in the indicator for non-polar extractables NPE_{uv} of 2.51 t/year.

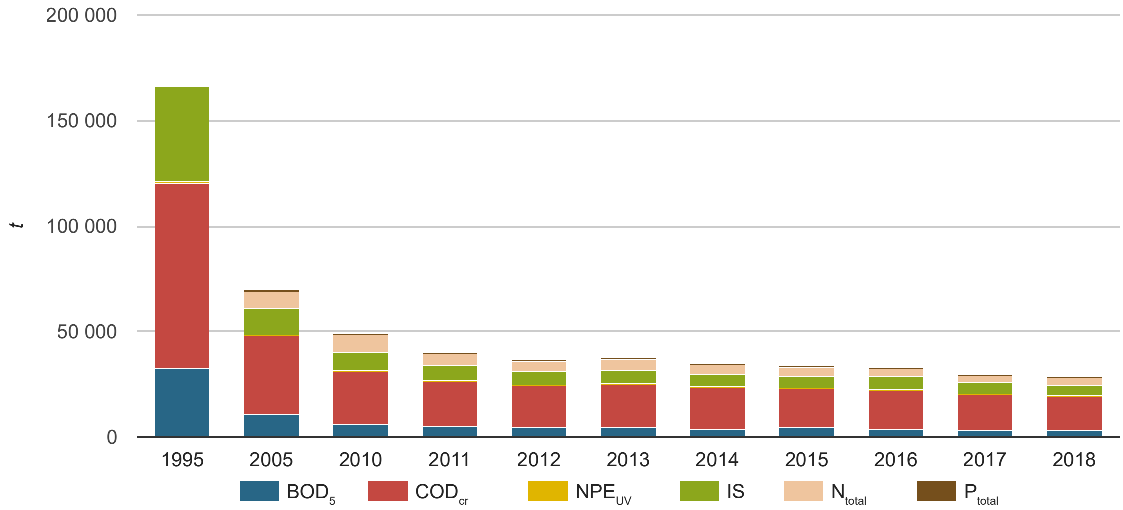
The percentage of discharged treated waste water to the **total quantity of waste water** discharged into watercourses was 93.06% in 2018.

Chart 023 I Trend in the discharge of treated and non-treated waste water into watercourses



Source: Slovak Hydrometeorological Institute

Chart 024 I Contamination of waste water discharged into surface water



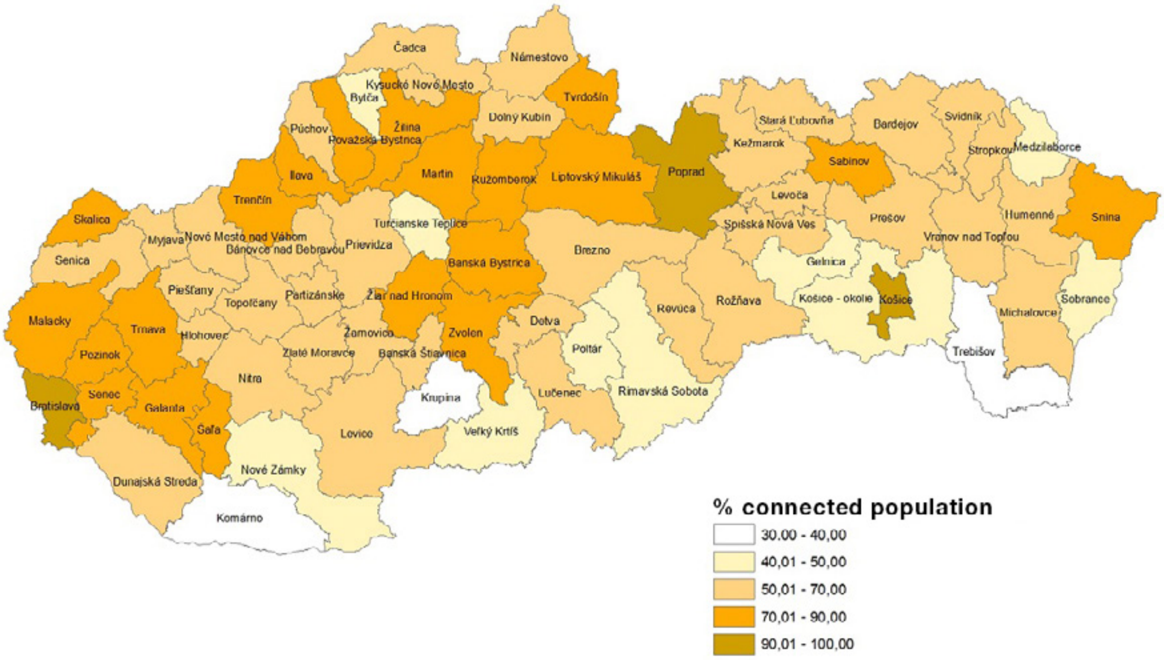
Source: Slovak Hydrometeorological Institute

Waste water collection

The number of people living in houses **connected to a public sewerage system** reached 3 724 000, or 68.40% of the total. 1 128 municipalities (39.03% of the total number of municipalities SR) had constructed a public sewerage system.

One of the goals of **Envirostrategy 2030** is to increase the percentage of treated waste water and achieve 100% collected and treated waste water in agglomerations with over 2 000 population equivalent. For agglomerations with under 2 000 population equivalent, the goal is 50% collected and treated waste water. In 2016, the share of inhabitants connected to a public sewerage system in the 2 047 agglomerations in the size category under 2 000 population equivalent was 26.09%. In the 356 agglomerations in the size category over 2 000 population equivalent the share was 84.12%.

Map 007 I Share of population connected to a public sewerage system (2018)



Source: Water Research Institute

Waste water treatment

In 2018, 706 waste water treatment plants were managed by water companies, municipal authorities and other entities, most of which were mechanical/biological WWTPs. The total capacity of these waste water treatment plants in 2018 was 2 422 200 m^3/day.

Sewage sludge is a necessary by-product of the waste water treatment process. In 2018 the total generation of sludge from treatment plants for municipal waste water was 55 929 t of sludge dry matter, while 44 659 t of sludge dry matter was recovered (79.85%).

Table 008 I Sludge generated in waste water treatment plants (t)

Year	Sludge quantity (tonnes of dry matter)							
	Total	Recovered			Disposed of			Temporarily stored
		application on agricultural land	application on forest land	composting and other recovery	energy recovery	incinerated	stored	
2005	56 360	5 870	0	33 250	0	0	8 530	8 710
2010	54 760	923	0	47 140	0	0	16	6 681
2018	55 929	0	0	32 982	11 677	0	2 451	8 819

Source: Water Research Institute

QUALITY OF BATHING WATER

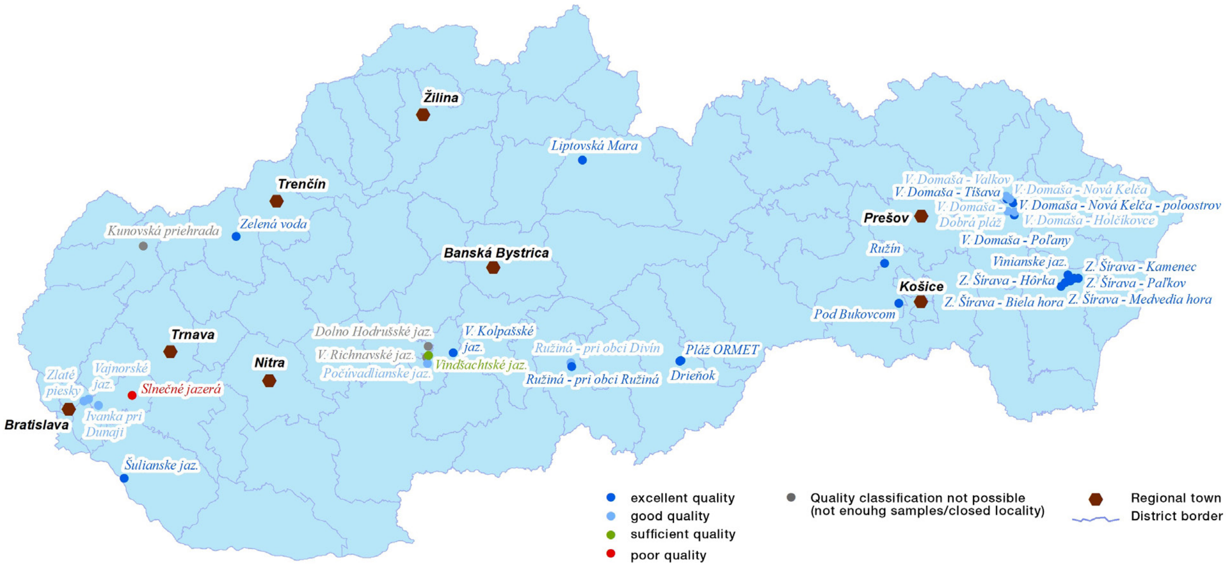
At natural water bodies and artificial bathing pools during the 2018 bathing season, the hygiene situation was monitored by the public health authorities in accordance with **Act No 355/2007, on the protection, promotion and development of public health and on amendments and supplements to some other Acts, as amended, as well as Decree of the Ministry of Health of the SR No 308/2012, on requirements for water quality, water quality control and on the requirements for the operation and equipping of operating areas, premises and facilities at natural and artificial bathing areas, and Decree of the Ministry of Health of the SR No 309/2012, on the requirements for bathing water.**

During the 2018 season, 82 natural water bodies were subject to detailed assessment, with organised recreation taking place in 15 localities, meaning that these water bodies were operated as natural bathing areas. A total of 468 water samples were taken, on which 4 018 examinations of water quality indicators were carried out. The limit value (LV) of the determined indicators was exceeded in 29.27% of the total number of samples (in 2017 this was 25.44%) and for 6.12% of the total number of indicators (in 2017 this was 4.78%). The findings showed a slight deterioration in water quality in natural bathing areas, while the inadequate water quality depended on weather fluctuations in the majority of cases. 65.45% of the total number of unsatisfactory indicators related to health-insignificant physical/chemical indicators (transparency, colour, oxygen saturation, total organic carbon, pH). Of the unsatisfactory microbiological water quality indicators, the most represented was enteric cocci, followed by *Escherichia coli* and coliform bacteria. In the majority of cases this was only short-term contamination.

In 2018 the SR assessed and classified the quality of bathing water pursuant to the requirements of Directive 2006/7/EC. In the 2018 bathing season, 32 natural water localities were assessed and monitored, which had been classified as so-called bathing localities through generally binding legislation from regional environment authorities. 18 bathing localities were classified by the EC as localities with excellent bathing water quality, 9 localities had good quality bathing water, one locality had sufficient water quality and one locality had insufficient bathing water quality. Due to reconstruction and the discharge of water from reservoirs it was not possible to classify three localities - *Kunovská priehrada, Dolno Hodrušské jazero and Veľké Richnavské jazero* - in 2018.

During the 2018 bathing season, no diseases or health-related complications related to bathing at a natural bathing area were recorded.

Map 008 I Quality of bathing water during the 2018 summer tourism season



Source: Public Health Authority SR, European Commision, Slovak Environmental Agency

ROCKS

KEY QUESTIONS AND KEY FINDINGS

What geological risks most threaten the environment and, ultimately, also human beings?
SSlope deformations are one of the most significant geodynamic processes. In the SR, 21 190 slope deformations covering an area of 257 500 ha, or 5.25% of Slovak territory, have been registered. Landslides accounted for the largest share of slope deformations (19 104).

In recent years, as a consequence of unfavourable climatic conditions, the greatest risk is posed by slope deformations that often directly endanger the lives and property of the population. During 2018, there were several situations when the State Geological Institute of Dionýz Štúr reported emergencies ascertained through monitoring, respectively in 12 cases provided an opinion based on requests from municipalities. In 2018, 9 slope deformations were registered.

In 2018, 5 earthquakes were observed macroseismically in Slovakia, of which 4 with an epicentre in Slovakia and 1 with an epicentre in Poland.

What is the status of use of geothermal energy in the SR?
Geothermal energy has significant potential in the SR. At present, geothermal waters are used at 48 localities mainly for recreation, but also for heating. The total thermal energy potential of geothermal energy is estimated at 6 234 MWt.

ENVIRONMENTAL GEOLOGICAL FACTORS

In 2018 the monitoring of measurements within the framework of **PMS-Geological Factors (PMS GF)** continued in the following subsystems:

- **Landslides and other slope deformations,**
- **Tectonic and seismic activity in the territory,**
- **The impact of mining on the environment,**
- **Monitoring of radon volume activity in the geological environment,**
- **The stability of rock massifs under historical sites,**
- **River sediment monitoring.**

Using the monitoring results, we can monitor emerging threats and subsequently adopt measures sufficiently in advance to prevent emergencies, and thus protect people's lives and health and prevent property damage.
In 2013 the **Landslide Risk Prevention and Management** Programme **(2014-2020)** was adopted and subsequently updated in 2018. Its key goal is to reduce the risk of landslides to lives, property and the environment and prevent degradation of the natural environment, ecosystems and their services by 2020. One of the goals of **Envirostrategy 2030** is to effectively monitor and minimize geological hazards and risks.