Ministry of the Environment
of the Czech Republic

MINISTRY OF AGRICULTURE
OF THE CZECH REPUBLIC

# REPORT ON WATER MANAGEMENT IN THE CZECH REPUBLIC IN 2017

# Report on Water Management in the Czech Republic in 2017

Ministry of Agriculture of the Czech Republic
Ministry of the Environment of the Czech Republic

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*Dear readers,*

*The 2017 issue of the "Report on Water Management in the Czech Republic", an annual publication known familiarly as the Blue Report, is one of essential materials that the Ministry of Agriculture has been publishing since 1997. Traditionally, we have prepared the publication in cooperation with the Ministry of Agriculture. Its main objective is to present readers with an overview of activities linked with water management performed in 2017, development trends and changes made.*

*Our planet is more and more intensely affected by climate changes. Extreme hydrological drought has persisted since 2014, which is why a great part of the publication is dedicated to this phenomenon. It is paramount to ensure sufficient amount of drinking water as well as water for industry, agriculture and other spheres and in adequate quality. Water management is very closely linked with precipitations and temperature, water quality and sources of pollution, water processing and watercourse administration. The crucial sphere is state financial support, legislative and strategic documents and international cooperation.*

*The Ministry of Agriculture is one of the pivotal water management authorities and it is the founder of five River Boards, state enterprises, and Forests of the Czech Republic, state enterprise. Logically, the publication also contains information about their activities in 2017 and compares them with previous years. As you will find out, these state enterprises administer 94.5% of the total length of all watercourses in the Czech Republic.*

*The publication presents a lot of new facts. It is the first time we have informed about monitoring of specific substances in surface waters that is conducted by laboratories of the River Boards. They monitor residues of pesticides, pharmaceuticals, hormone preparations and other specific substances. The yearbook includes graphs that show new ways of looking at water management. From the perspective of long-term monitoring it is interesting to notice the development of the amount of waters abstracted and discharged that has dropped by some 50% as compared with 1990. What readers may also find interesting is the comparison of the use of ground and surface waters by industries. Another piece of information worth noticing is the comparison of distribution of water supply by the River Boards that differs significantly. Supplies for water distribution systems represent a steady income of the state enterprises, whereas supplies for industry and other spheres may be changeable and unsteady to a rather great extent.*

*In 2017, more than 10 million citizens were supplied with water from the water supply system and more than 9 million people were connected to the sewerage system. Water consumption rose to 88.7 l/person/day. The length of the water supply system was extended to almost 79 thousand km and the length of the sewerage system to 48.5 thousand km. The number of water treatment plants exceeded 2,600.*

*Water management is supported under national and transnational grant programmes of the Ministry of Agriculture, the Ministry of the Environment and the Ministry of Transport. The total amount of the state funds provided was more than CZK 5 billion in 2017. Under grants of the Ministry of Agriculture, more than CZK 3 billion was expended. The highest sum, CZK 1.7 billion, was allocated by the Ministry to the infrastructure of water supply and sewerage systems, flood prevention was funded with CZK 655 million and CZK 519 was allocated to minor watercourses and small water reservoirs. Funds were also used for land consolidation, fishery, fishponds and irrigation. The Ministry of Agriculture contributed with more than CZK 35 million to water management research and development.*

*I believe that you come across many interesting pieces of information concerning water management while reading the Blue Report for 2017. Water and water management is vitally important for us and it deserves our attention. The Blue Report shows you water management from many different perspectives. I wish to bolster responsible approach to water management and raise public awareness of the importance of water, its current situation, water management activities and to ensure we have enough water in the future.*

*Miroslav Toman*
*Minister of Agriculture*
*of the Czech Republic*

*Dear readers,*

*Just as every year, the Report on Water Management in the Czech Republic is issued also for 2017. The purpose of the publication, referred to as the Blue Report, is not only to present a comprehensive overview of the condition and quality of ground and surface waters, but also of activities undertaken when managing such an important commodity that water undeniably is.*

*Just as anywhere in the world, we face extreme phenomena linked with the climate change also in the Czech Republic. Mitigating its impacts is a priority on the agenda of the Ministry of the Environment.*

*In the past couple of years the Czech Republic has been plagued by intense droughts. Although with respect to the amount of precipitations 2017 was an average year, impacts of the drought episode of 2014–2016 were perceptible until October 2017 in the below-average amount of groundwaters almost in the whole of the Czech Republic. Taking into account results of monitoring by the Czech Hydrometeorological Institute it cannot be ruled out that droughts may be even longer in future.*

*The interdepartmental committee WATER-DROUGHT, established in 2014, presented at the beginning of 2017 information about the manner of performing tasks assigned by Government Resolution No. 620/2015. At the end of June the Ministry of Agriculture and the Ministry of the Environment submitted to the government the Concept of protection against consequences of drought in the Czech Republic and the government subsequently approved the concept with Government Resolution No. 528 of 24 July 2017.*

*From the perspective of droughts, 2017 was a calm year, the most significant episodes consisted in winter floods caused by a combination of rainfall with snow melting. However, scientists warn that drought and floods are two sides of the same coin and it is necessary to anticipate more significant floods to occur in future.*

*Also this year the State Environmental Fund administers two sub-programmes under programme 115 270 „MoE Remedying Damage Caused by Natural Disasters": sub-programme 115 272 „MoE Floods 2013" that eliminates flood damage from May and June 2013 and sub-programme 115 273 „Remedying Damage Caused by Natural Disasters in 2014" that was created in response to landslides in Southern Moravia in 2014. Upon meeting the sub-programme requirements the applicants received relevant documents and financial support paid in the form of grants.*

*In 2017 our ministry continued to provide financial support under transnational and national grants. Financial support from the state budged amounted to CZK 1,659.1 million and financial support from the State Environmental Fund to CZK 43.7 million. Therefore, the Ministry of the Environment funded water management with a total of CZK 1,702.8 million in 2017.*

*I would also like to mention that throughout 2017 the amendment to the Water Act was being finalized. The Water Act was published in the Collection of Law as No. 113/2018 and it comes into force on 1 January 2019.*

*In conclusion, I would like to emphasise that Alpha and Omega of water management is water retention in the landscape. Our country does not have any incoming river flow. All our watercourses rise in the Czech Republic and then flow away. We simply do not have any other water but from precipitation. Sadly, water was rather driven away from our country in the past. Rivers were straightened and enclosed in concrete riverbeds. In the past eighty years we have dried out a million hectares of wetland. Water from agricultural land was conducted away by ameliorations.*

*Today we know that we must keep water on our territory longer and create conditions so that much more water can soak in. For this purpose a series of projects have been initiated. A large number of new ponds, pools and wetland are being constructed, watercourses are being revitalized and rainfall management is being supported.*

*I am positive that in order to improve the situation in water management it is also necessary to raise public awareness. I hope this will be contributed to by this yearbook.*

*Richard Brabec*
*Minister of the Environment*
*of the Czech Republic*

*(source: Shutterstock, author: Andrii Zastrzhnov)*

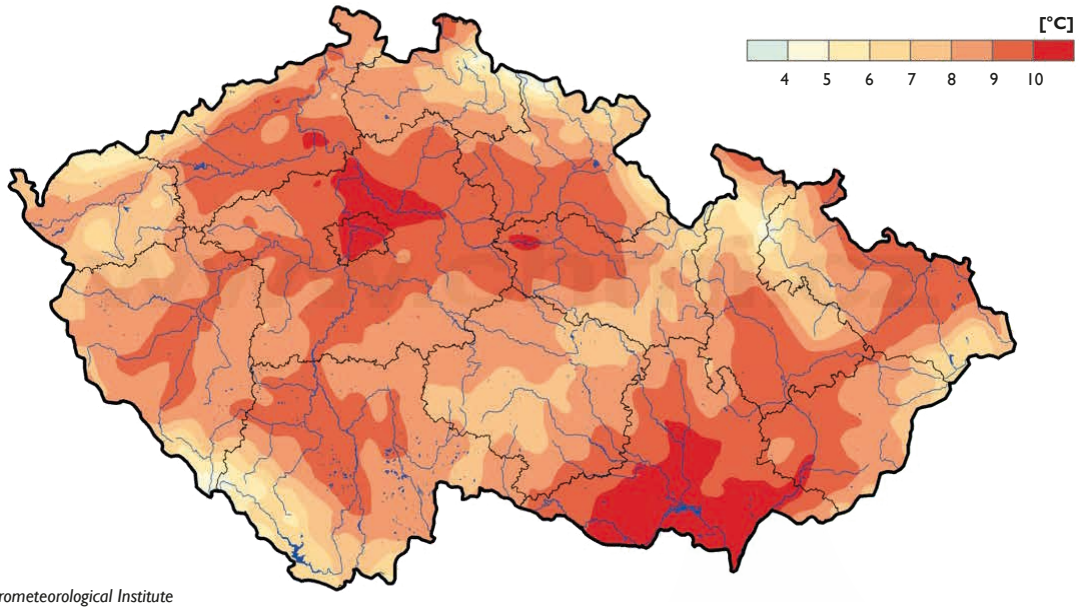
# 1. HYDROLOGICAL BALANCE

## 1.1 Temperature and precipitation

In terms of temperature, 2017 was markedly above the average in the Czech Republic. The annual mean air temperature of 8.6 °C exceeded the value of the long-term average (1981–2010) by 0.7 °C. 2017 was only by 0.1 °C colder than 2016 and ranks as 9th-10th warmest year since 1961. The highest annual mean air temperature in the Czech Republic since 1961 was 9.4 °C in 2014 and 2015. In general, the period from 2014 to 2017 was considerably above-average.

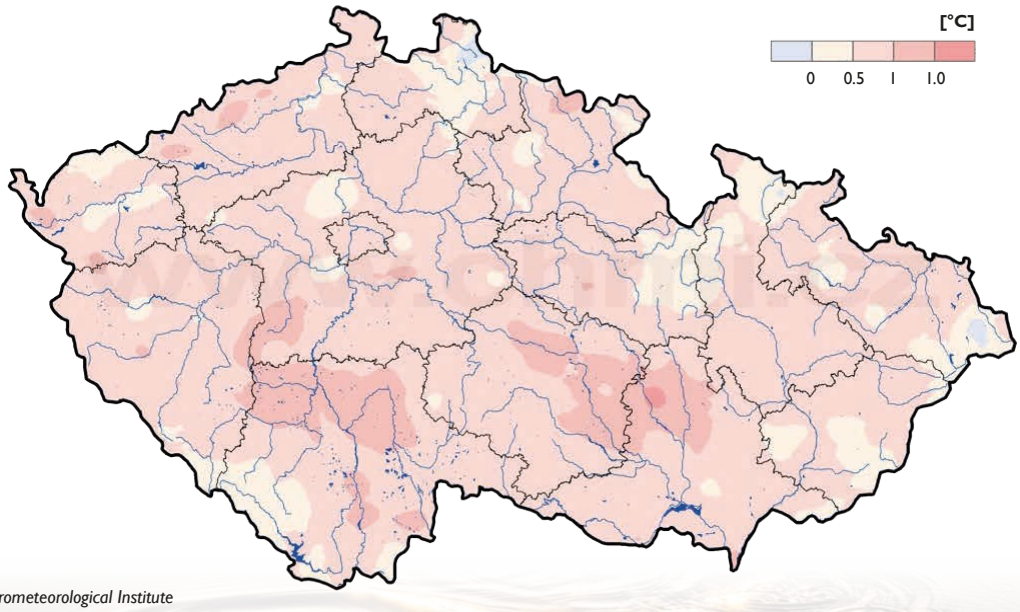
*Winter (source: Ohře River Board, s. e.)*

***Figure 1.1.1***
***Average air temperature in the Czech Republic in 2017***



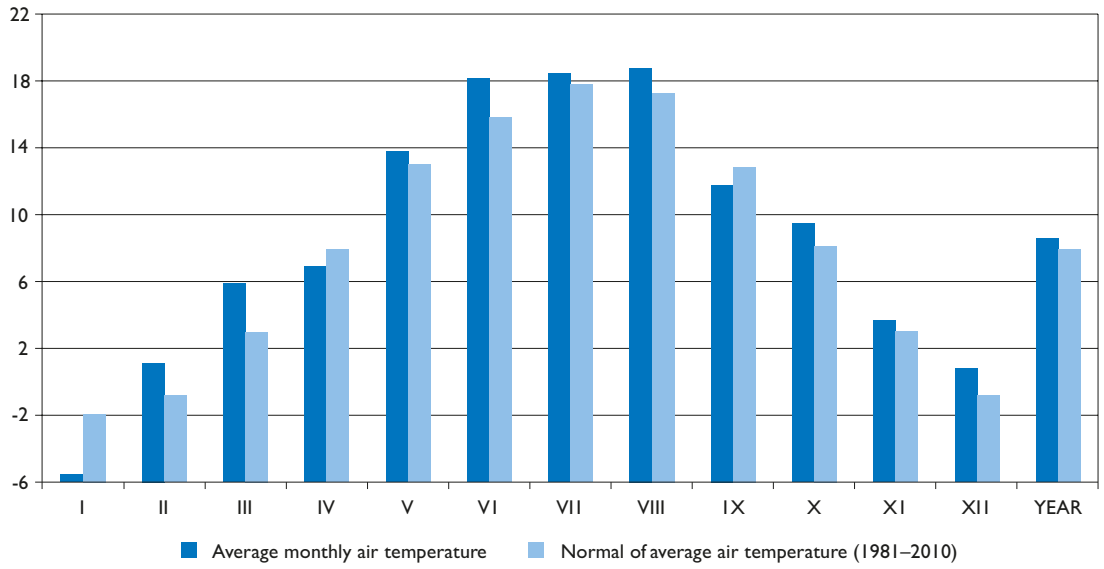

*Source: Czech Hydrometeorological Institute*

***Figure 1.1.2***
***Deviation from the average air temperature in 2017 from the long-term average of 1981–2010***




*Source: Czech Hydrometeorological Institute*

***Chart 1.1.1***
***Average monthly air temperature in the Czech Republic in 2017 in comparison with the long-term average of 1981–2010***




*Source: Czech Hydrometeorological Institute*

In terms of precipitation, 2017 was average with the mean precipitation of 683 mm. The average monthly amount of precipitation in most of 2017 was not out of the ordinary. Nevertheless, there were two distinctly above-average months: April (183% of the average) and October (188% of the average). Only May was below average with 64% of the average).

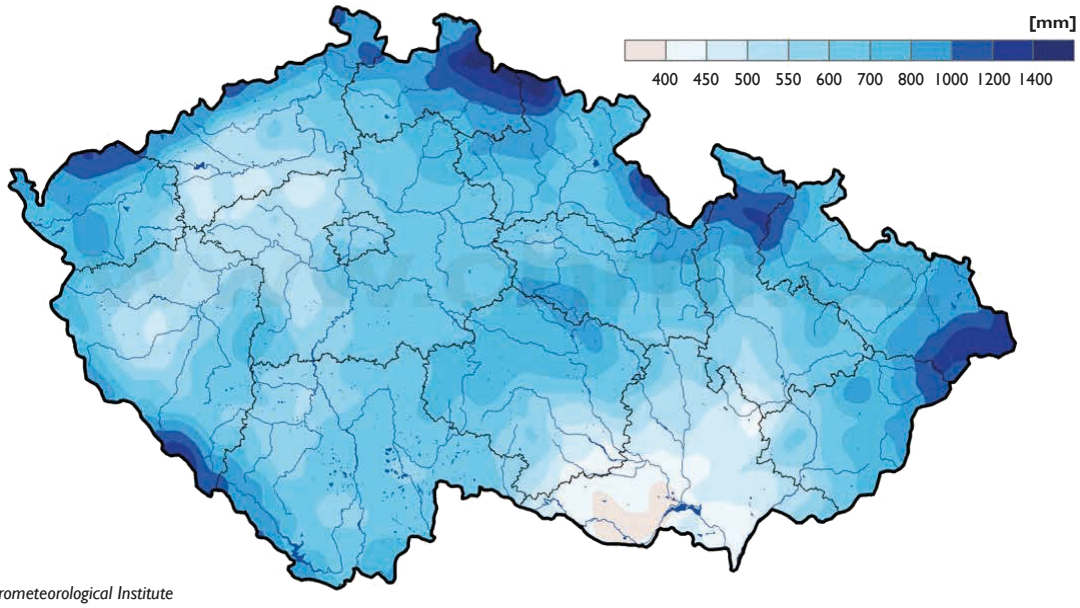
*The Rozkoš Dam (source: Elbe River Board, s. e.)*

### *Table 1.1.1*
### *Renewable water resources in 2010–2017*

| Item | Annual values (millions of m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Rainfall | 68 692 | 49 449 | 54 812 | 57 336 | 51 815 | 41 957 | 50 240 | 53 868 |
| Evapotranspiration | 46 824 | 35 511 | 42 239 | 38 296 | 41 542 | 32 165 | 40 223 | 43 424 |
| Annual inflow [1)] | 781 | 482 | 492 | 845 | 388 | 398 | 402 | 339 |
| Annual runoff [2)] | 22 649 | 14 420 | 13 065 | 19 885 | 10 661 | 10 190 | 10 419 | 10 783 |
| Sources of surface water [3)] | 8 788 | 5 770 | 5 195 | 6 626 | 5 273 | 3 591 | 4 421 | 4 258 |
| Usable sources of groundwater [4)] | 1 594 | 1 340 | 1 311 | 1 657 | 1 077 | 939 | 925 | 911 |

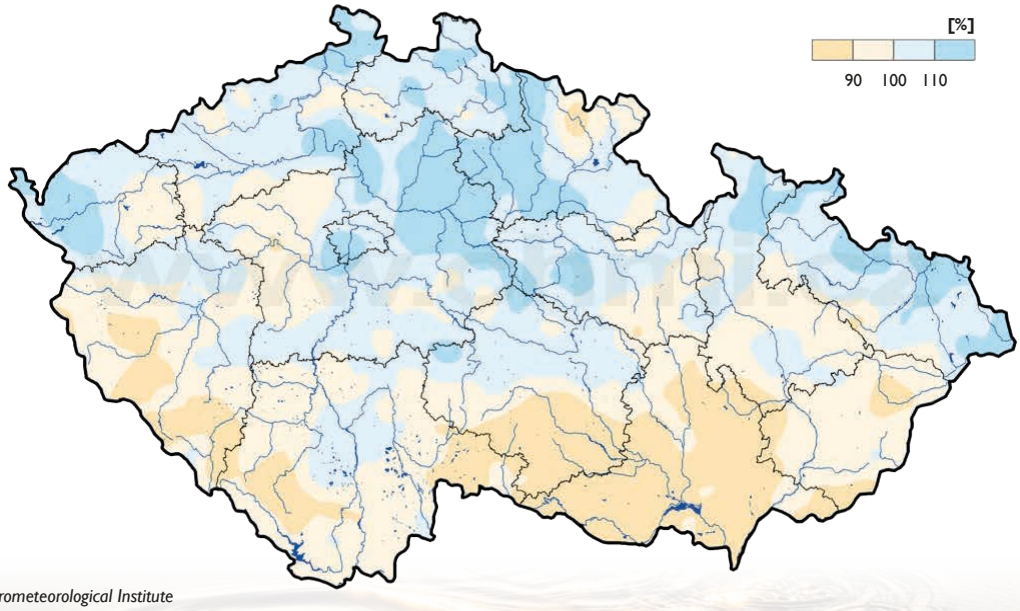
*Source: Czech Hydrometeorological Institute*
*Note: [1)] Annual inflow to the territory of the Czech Republic from the neighbouring states.*
*[2)] Annual runoff from the territory of the Czech Republic.*
*[3)] Determined as the flow in the main catchment areas with 95% probability.*
*[4)] A qualified estimate, more detailed specifications are published by the Czech Hydrometeorological Institute in the second half of 2018.*

### *Figure 1.1.3*
### *Distribution of rainfall in 2017*



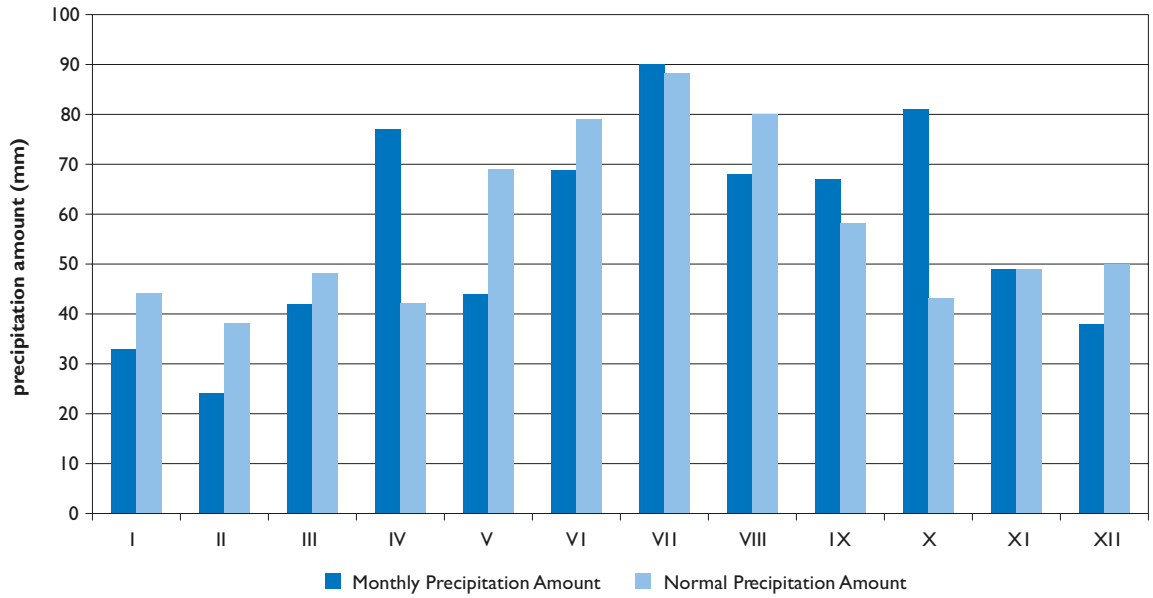

*Source: Czech Hydrometeorological Institute*

### *Figure 1.1.4*
### *Total precipitation in 2017 compared with the average of 1981–1910 (in %)*




*Source: Czech Hydrometeorological Institute*

***Chart 1.1.2***
***Average monthly precipitation in the Czech Republic in 2017 in comparison with the average of 1981–2010***




*Source: Czech Hydrometeorological Institute*

*The Water Station, Rejštejn on the Otava River (source: Czech Hydrometeorological Institute)*

## 1.2 Runoff

In terms of runoff, 2017 reached below-average values in most of the territory of the Czech Republic. The lowest flows were in the Dyje River Basin, while flows near the values of the long-term average were in the Oder and Olše River Basins. In general, 2014–2017 was below-average in terms of runoff.

***Table 1.2.1***
***Runoff in 2017 compared with the long-term monthly flow averages (in %)***

| Tok | Profil | January | February | March | April | May | June | July | August | September | October | November | December | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (%) | | | | | | | | | | | | |
| Orlice | Týniště n. O. | backed up | 96 | 75 | 49 | 85 | 67 | 77 | 55 | 43 | 183 | 175 | 126 | 85.5 |
| Jizera | Bakov | backed up | 135 | 99 | 69 | 89 | 60 | 89 | 40 | 62 | 219 | 143 | 114 | 97.9 |
| Elbe | Přelouč | 32 | 67 | 58 | 56 | 69 | 51 | 58 | 56 | 61 | 147 | 161 | 115 | 72.6 |
| Elbe | Kostelec n. L. | 31 | 83 | 58 | 49 | 59 | 31 | 48 | 40 | 46 | 173 | 173 | 123 | 68.9 |
| Lužnice | Bechyně | backed up | backed up | 76 | 65 | 127 | 26 | 23 | 24 | 47 | 66 | 73 | 57 | 63 |
| Otava | Písek | backed up | backed up | 82 | 75 | 135 | 39 | 37 | 29 | 48 | 67 | 68 | 54 | 70 |
| Sázava | Nespeky | backed up | backed up | 41 | 68 | 140 | 38 | 43 | 18 | 36 | 63 | 70 | 73 | 65.8 |
| Berounka | Beroun | backed up | backed up | 53 | 59 | 119 | 35 | 49 | 30 | 50 | 57 | 78 | 89 | 59.1 |
| Vltava | Praha-Chuchle | 34 | 53 | 54 | 59 | 134 | 44 | 53 | 39 | 57 | 56 | 77 | 64 | 62.3 |
| Ohře | Louny | 50 | 58 | 87 | 58 | 60 | 43 | 49 | 49 | 75 | 90 | 129 | 147 | 77.2 |
| Elbe | Ústí n. L. | 36 | 61 | 61 | 58 | 95 | 47 | 53 | 44 | 63 | 92 | 106 | 91 | 65.5 |
| Elbe | Děčín | 39 | 63 | 64 | 59 | 95 | 47 | 52 | 44 | 60 | 90 | 108 | 95 | 65.4 |
| Oder | Bohumín | 51 | 88 | 66 | 115 | 132 | 42 | 30 | 33 | 153 | 131 | 125 | 100 | 86.1 |
| Olše | Věřňovice | backed up | backed up | 80 | 148 | 96 | 33 | 41 | 25 | 268 | 228 | 154 | 121 | 115.3 |
| Bečva | Dluhonice | backed up | backed up | 62 | 127 | 100 | 26 | 15 | 19 | 106 | 148 | 148 | 123 | 86.1 |
| Morava | Strážnice | backed up | backed up | 55 | 66 | 86 | 32 | 29 | 28 | 71 | 122 | 135 | 114 | 68.5 |
| Jihlava | Ivančice | backed up | 29 | 19 | 25 | 39 | 38 | 36 | 36 | 41 | 46 | 56 | 50 | 35.4 |
| Svratka | Židlochovice | 34 | 56 | 30 | 37 | 60 | 48 | 67 | 64 | 85 | 77 | 87 | 74 | 54.2 |
| Dyje | Ladná | 40 | 52 | 29 | 24 | 57 | 35 | 37 | 14 | 47 | 39 | 41 | 56 | 39.1 |

*Source: Czech Hydrometeorological Institute*

*Novodomská Rest Stop (source: Ohře River Board, s. e.)*

## 1.3 Groundwater regime

In 2017 there was a significant deficit of shallow wells and yield of springs at the beginning of the year and in spring. The lowest levels were reached at the turn of summer/autumn, subsequently, shallow wells and springs were gradually refilled towards the end of the year. The deficit of groundwater in South Moravia and in the Dyje River Basin increased. By contrast, the situation in North-East Bohemia and in the Upper Elbe River Basin improved significantly. The water level and yield values were lower than usual until autumn, only the last quarter of the year brought about improvement, in most of the Czech Republic to normal values. On the whole, the water levels and yield of springs stated in the annual assessment for 2017 are similar to the previous year. Nevertheless, the period of 2014–2017 can be considered below-average and alarming.


*Dolní Beřkovice – the Water Level Gauge of Historic Floods (author: Petra Hubalová)*

# 2. HYDROLOGICAL EXTREMES

## 2.1 Flood situations

In terms of floods, 2017 was calm, there were mainly winter floods caused by rainfall in combination with snow melting. In terms of runoff, a significant situation occurred in connection with Cyclone Herwart at the end of October. The maximum level achieved in these cases was $Q_2$ at the most. The highest recorded extreme was $Q_5$ at Štěchovice on the Kocába Stream at the end of June which was due to heavy rainfall.

## 2.2 Remedying flood damage

### *Ministry of Agriculture*

In 2017, the programme 129 280 "Support of Water Retention in the Landscape – Fishponds and Water Reservoirs" continued. Its sub-programme 129 284 "Remedying Damage at Fishponds and Water Reservoirs" is focused on eliminating flood damage at fishponds and water reservoirs.

The programme 129 270 "Remedying Flood Damage to State-owned Water Management Property II" was not used in 2017; only its sub-programme 129 272 "Remedying the Impacts of Floods in 2013" underwent final assessment.

In 2017, new programme called 129 320 „Support of Remedying Flood Damage to the Infrastructure of Water Supply and Sewerage Systems II" which is a follow-up to the terminated programme 129 140.

### *Ministry of the Environment*

The Ministry of the Environment continued in 2017 administering the grant programme 115 270 "MoE Clean-up after natural disasters".

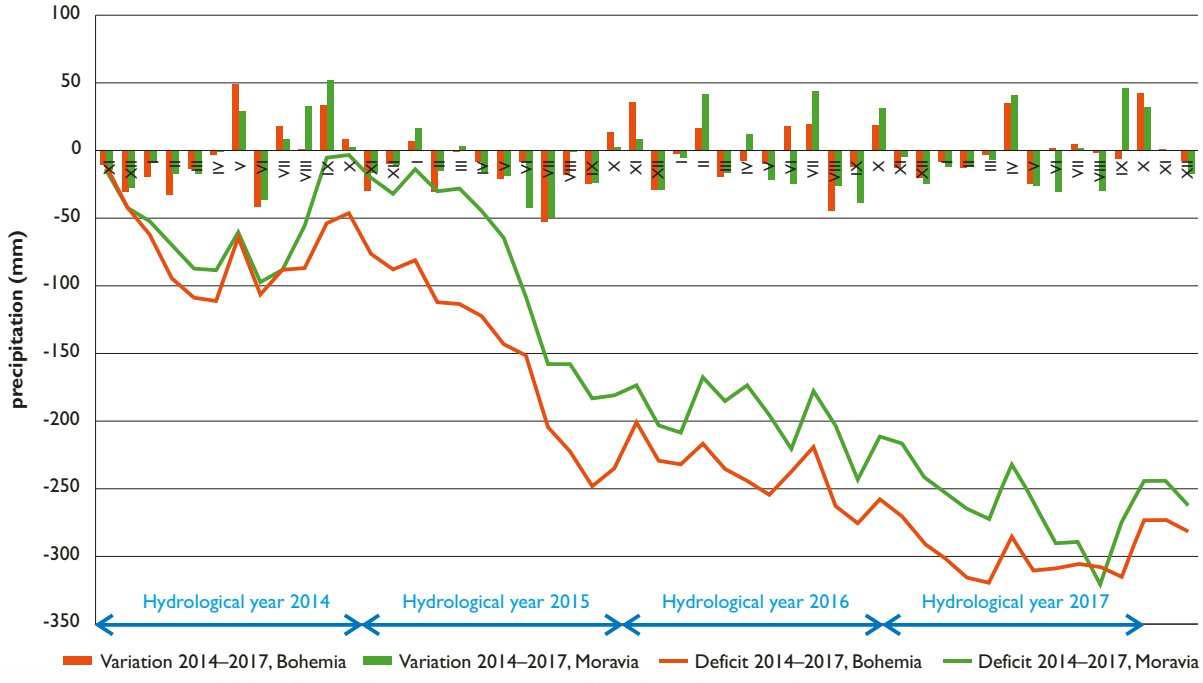
*Vranov Dam under the Castle Bítov, November 2017 (author: Vladimír Husák)*

*Rožnovská Bečva, Valašské Meziříčí, April 2017 (source: Morava River Board, s. e.)*

## 2.3 Drought situation

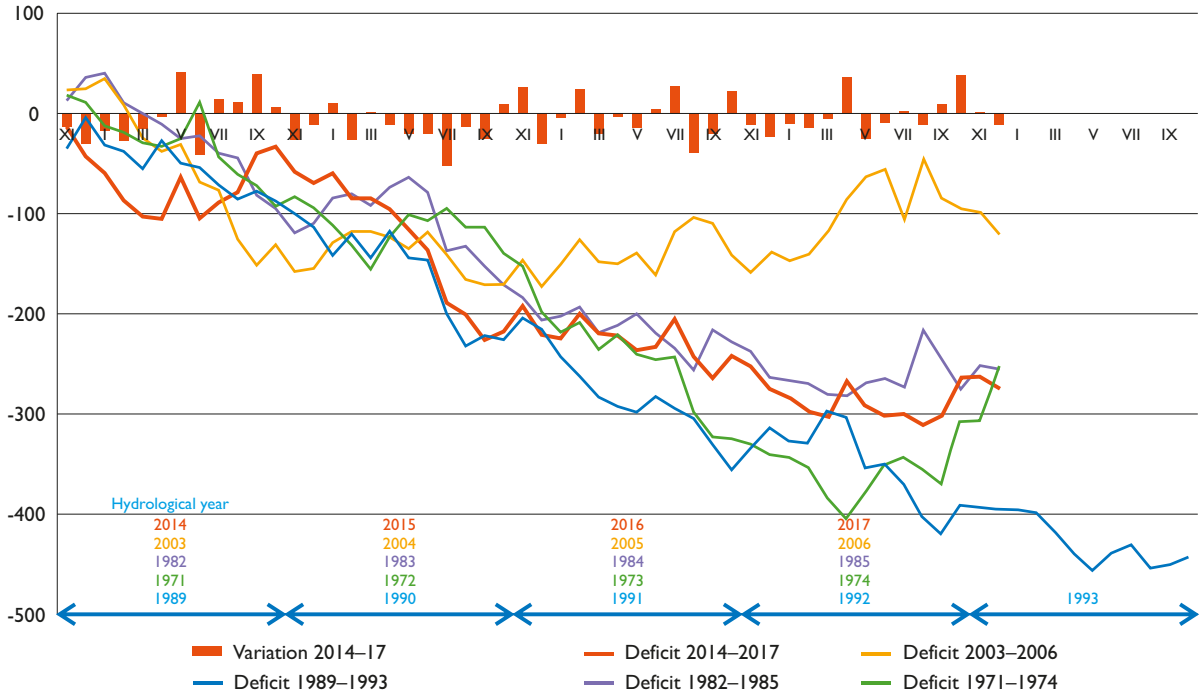
In the recent years, the Czech Republic has been beset by an intense dry episode. In terms of the amount of rainfall 2017 was an average year. The impacts of the dry episode of 2014–2016 were noticeable until October 2017 on the below-average level of groundwaters almost in the entire Czech Republic. The Czech Hydrometeorological Institute has monitored and researched the historic occurrence of drought over a long period. The results of the observation suggest that it cannot be excluded that periods of drought can be even longer in future than now.

***Chart 2.3.1***
***The course of precipitation deficit in Bohemia and Moravia compared with long-term average (1981–2010) in 2014–2017***




*Source: Czech Hydrometeorological Institute*

***Chart 2.3.2***
***Comparison of the average precipitation deficit in the Czech Republic with other drought episodes***




*Source: Czech Hydrometeorological Institute*

## 2.4 Interdepartmental committee WATER-DROUGHT

In 2017, the interdepartmental committee WATER-DROUGHT completed the tasks resulting from Government Resolution No. 620/2015. At the end of June, the Ministry of Agriculture and the Ministry of the Environment submitted to the government the Concept of protection against consequences of drought in the Czech Republic and the government approved the concept with Government Resolution No. 528 of 24/07 2017.

*Svratka, The Vír Dam – drought, September 2017 (author: Vladimír Husák)*

*The Seč Dam (source: Elbe River Board, s. e.)*

# 3. QUALITY OF SURFACE WATERS AND GROUNDWATERS

## 3.1 Surface water quality

The map of the quality of waters in selected watercourses of the Czech Republic was first produced for the 1991–1992 period. Since then, analogical maps have been elaborated every year so that the current quality of waters can be compared. The comparison of the monitored indicators clearly shows that the quality of surface waters has significantly improved in the past 25 years.

Radiologic indicators in surface waters have been monitored over long term at selected profiles of the state monitoring network. The profiles are situated at locations of the current nuclear facilities and in sections of watercourses affected by mine water discharges and by seepage from refuse dumps at locations where uranium ores were formerly mined or treated.

Similarly to previous years, water eutrophication (a process caused by an increased content of mineral nutrients, particularly phosphorus compounds and nitrogen compounds) occurred in many water reservoirs. Cyanobacteria occur in waters in the Czech Republic due to surface water pollution caused particularly by phosphorus which contributes to their excessive development at higher temperature and when there is a lot of sunshine. In the 2017 bathing season there was a ban at 14 out of a total of 265 monitored locations.

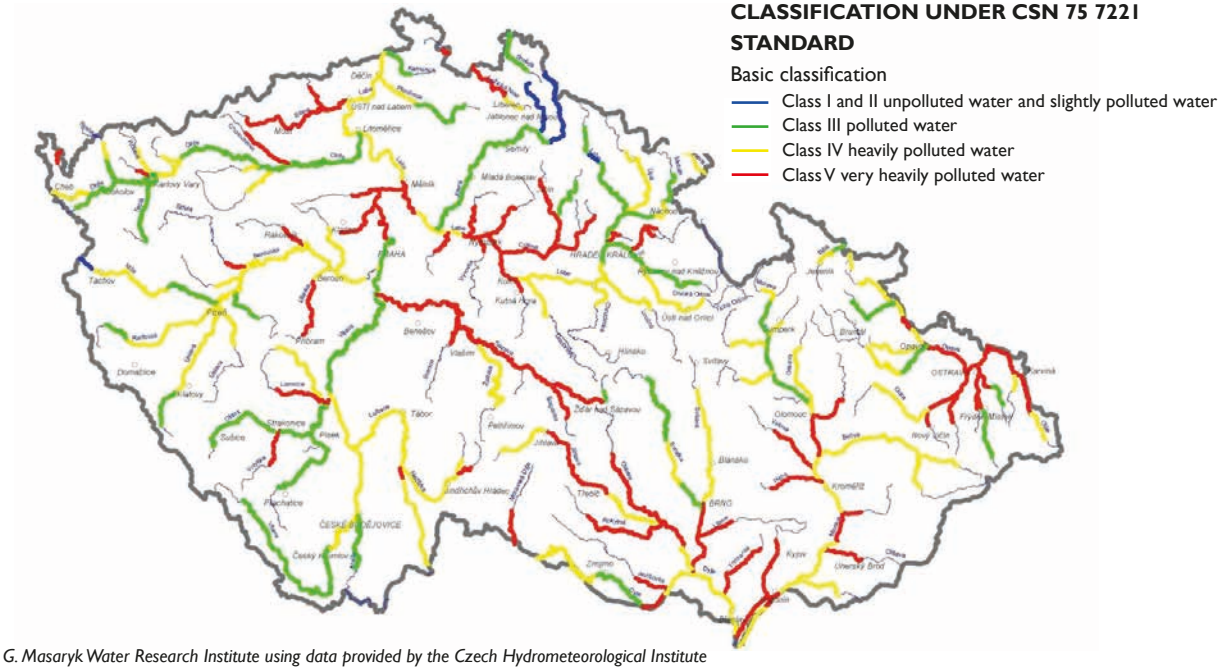
The comprehensive assessment of surface water quality and chemical condition of surface water bodies includes information about the quality of solid components of the water ecosystem such as suspended matters (undissolved substances transported in a watercourse as suspension) and river sediments. Analyses of some pollutants in washload and sediments, unlike analyses of water, provide more plausible information about the presence of given substances in watercourses. EU regulations require that surface water quality monitoring concerning substances with significant accumulation potential is complemented with monitoring of solid components; and in the case of 20 selected priority hazardous substances the EU regulations require monitoring of their long-term trends. Monitoring of the chemical condition of washload and sediments took place at 47 watercourse profiles in 2017.

*The Podhradský Pond – newly installed an ible wall, May 2017 (source: Morava River Board, s. e.)*

The programme of bio-accumulation monitoring allows for comprehensive determination of the condition of the locations and it contributes significantly to the increase in knowledge about the degree of contamination by biota. The monitoring is performed using not only fish and fry, but also other suitable matrices that accumulate pollutants in connection with the manner of food intake and habitat type. In 2017, contamination of aquatic organisms with priority hazardous substances was regularly monitored at 21 river profiles of significant Czech and Moravian rivers that are a part of the situation monitoring of surface waters.

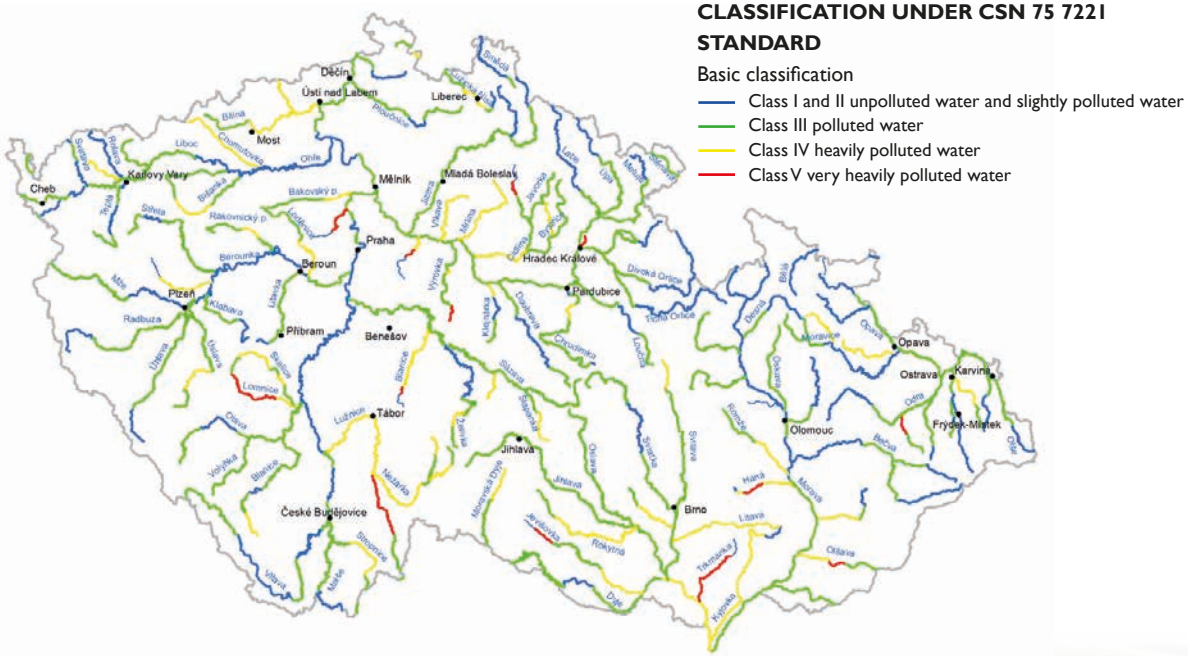
*Surface water abstraction – in the site Elbe-Valy (source: Czech Hydrometeorological Institute)*

***Figure 3.1.1***
***Quality of water in watercourses in the Czech Republic in 1991–1992***




*Source: T. G. Masaryk Water Research Institute using data provided by the Czech Hydrometeorological Institute*

***Figure 3.1.2***
***Quality of water in watercourses in the Czech Republic in 2016–2017***

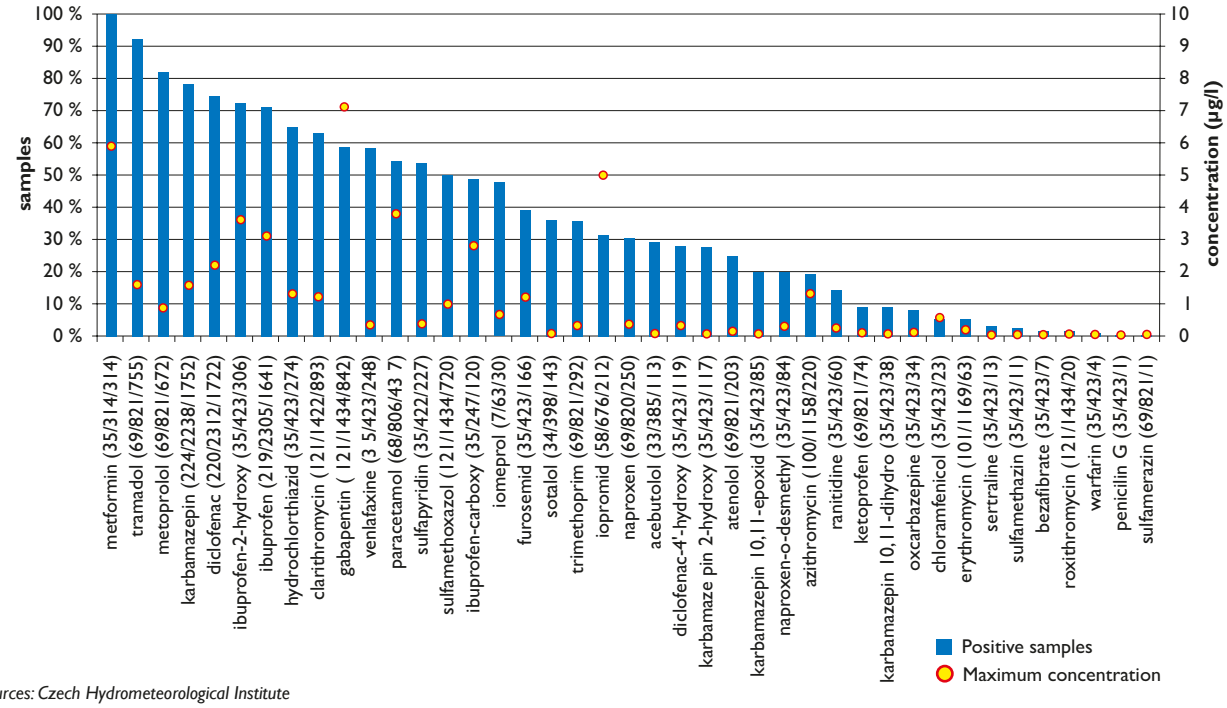



*Source: T. G. Masaryk Water Research Institute using data provided by River Boards, s. e., and Czech Hydrometeorological Institute*

### *Monitoring of specific substances in surface waters*

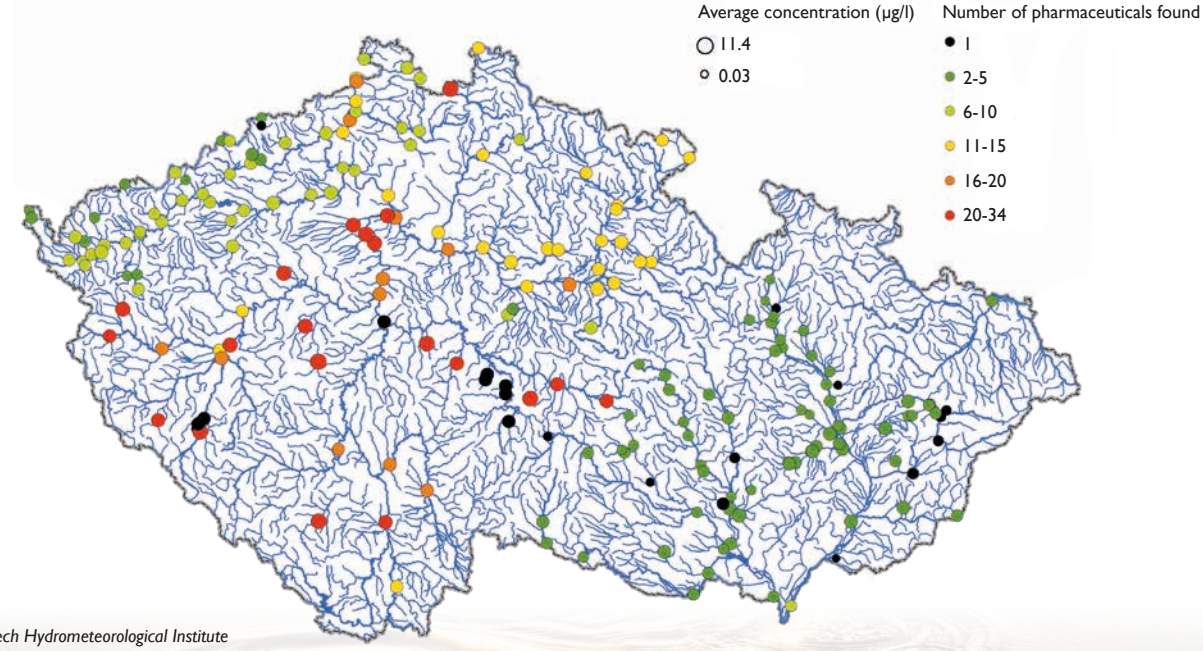
In the past couple of years, great deal of attention has been paid to the monitoring of surface water microcontaminants in the Czech Republic. The monitoring is focused particularly on residues of pesticides, pharmaceuticals, hormonal preparations, substances used for X-ray diagnostics, anti-corrosion substances and other specific substances. Laboratories of the River Boards, s. e., focus most on pesticides and other specific substances. Laboratories of the River Boards, s. e., focus primarily on pesticides and their metabolites (currently approximately 200 analytes are analyzed) that get in surface waters particularly from agriculture. A considerable amount of effective substances from pharmaceuticals and their metabolites gets to surface waters from point sources, at present there are between 60 and 80 analytes of pharmaceuticals and their metabolites. The occurrence of pharmaceutical preparations is considerable at some locations, especially in smaller watercourses to which waste waters from big municipalities flow.

***Chart 3.1.1***
***Monitoring of effective substances in pharmaceuticals in the Czech Republic in 2017***




*Sources: Czech Hydrometeorological Institute*
*Note: Data in brackets inform about the number of profiles/number of samples/number of positive samples.*

***Figure 3.1.3***
***Pharmaceuticals found in the Czech Republic (number and concentration) in 2017***



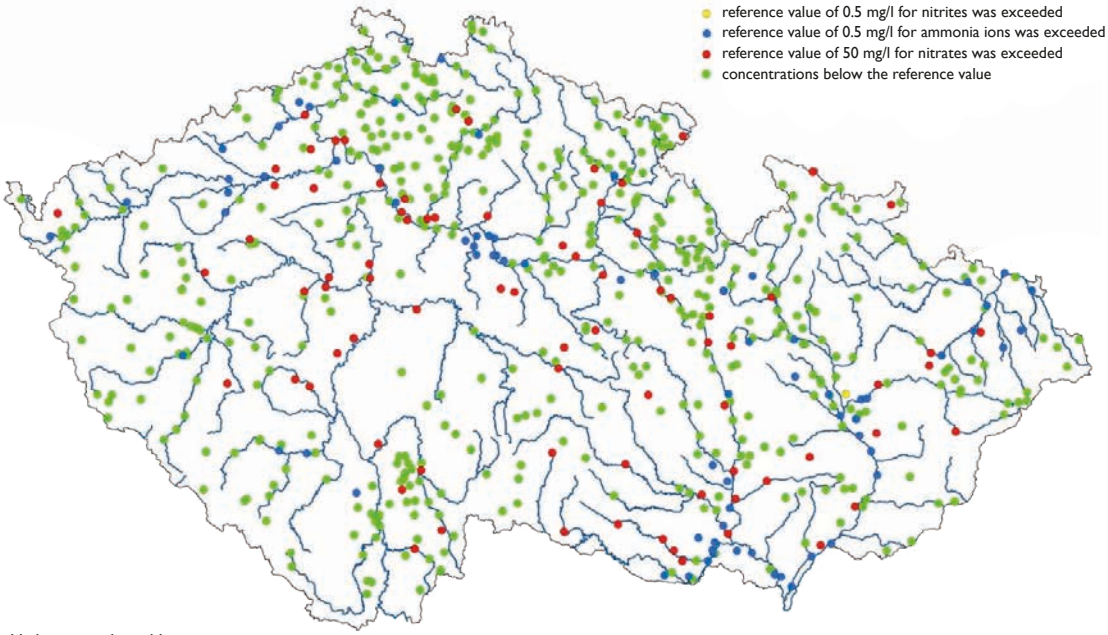

*Source: Czech Hydrometeorological Institute*

## 3.2 Groundwater quality

A total of 696 sites were monitored in the national groundwater quality monitoring network in 2017. They comprised 201 sources, 226 shallows wells and 269 deep wells. A total of 276 quality indicators were analyzed in 2017. Indicators from three major groups (basic indicators, metals and polar pesticides) were monitored at all sites in 2017. Other groups of indicators were analyzed at a selected number of locations. The number of locations with above limit values at the monitored groundwater sites slightly decreased in 2017.

*(source: Shutterstock, author: Pingpao)*

***Figure 3.2.1***
***Concentrations of nitrogenous substances in groundwaters in 2017 (exceedances of reference values under Decree No. 5/2011 Coll.)***

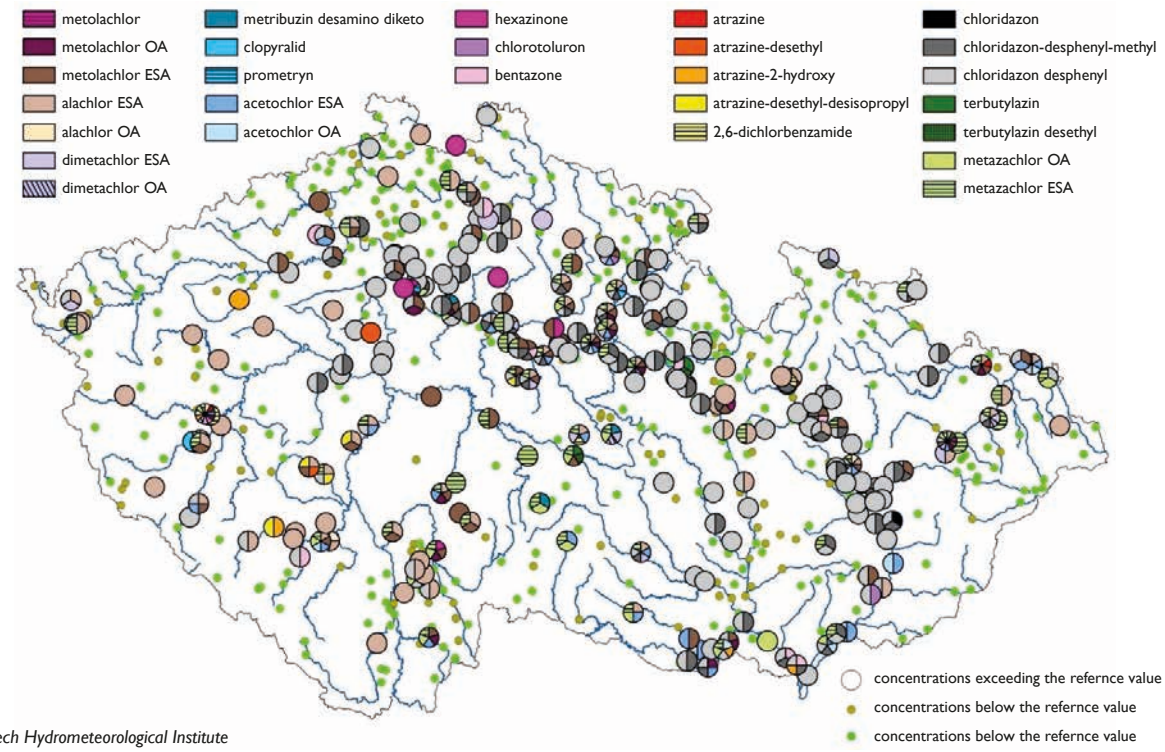



*Source: Czech Hydrometeorological Institute*

*Inserting the pump into the borehole before sampling the groundwater (source: Czech Hydrometeorological Institute)*


*Monitoring borehole VP7534 – Hlínoviště near Bělá pod Bezdězem (source: Czech Hydrometeorological Institute)*

***Figure 3.2.2***
***Concentrations of pesticides in groundwaters in 2017 (exceedances of reference values under Decree No. 5/2011 Coll.)***




*Source: Czech Hydrometeorological Institute*

*The Hamry Dam (source: Elbe River Board, s. e.)*

*Mirror of the Past (source: Ohře River Board, s. e.)*

# 4. WATER USE

The monitoring of data on groundwater and surface water abstractions and on discharged waters is governed by Decree No. 431/2001 Coll., on the Content of water balance, the method of its compilation and on data for the water balance. In 2017, there was a decrease in the amount of surface water abstraction and a slight increase in the amount of groundwater abstraction and discharged waters.

***Table 4.1***
***Classification of users in the individual user groups according to the NACE classification***

| | |
|---|---|
| Public water supply networks | NACE 36 |
| Public sewerage systems (excl. transfers) | NACE 37 |
| Agriculture (inlc. irrigation), forestry and fishing | NACE 01 – 03 |
| Energy sector (electricity and heat generation and distribution) | NACE 35 |
| Industry (incl. extraction of mineral resources – excl. energy sector) | NACE 05 – 33 |
| Other (incl. construction industry) | NACE 38 – 96 |
| Total (excl. fishponds and transfers) | NACE 01 – 96 |

*Source: Czech Statistical Office*

*The Thermal Power Plant Mělník, Horní Počaply (author: Petra Hubalová)*

## 4.1 Surface water abstractions

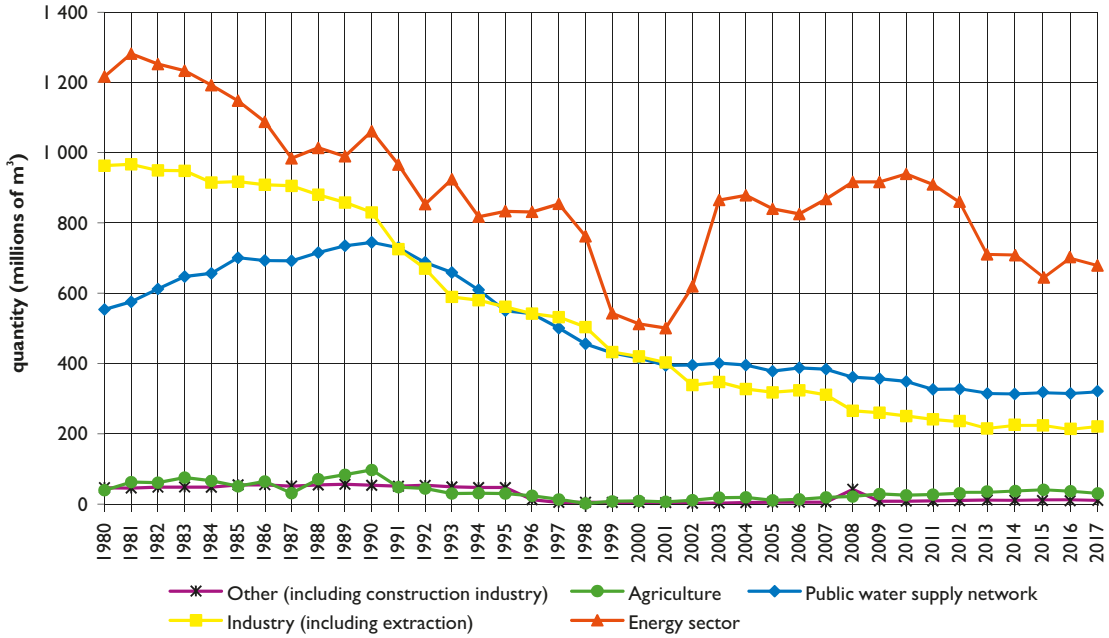
From the long-term perspective, it can be concluded that the year-on-year decrease in total abstraction of surface waters has rather stagnated. There were slight falls in the abstraction of surface waters in 2009, 2013, 2015 and 2017. In 2017, the total amount of water surface water abstraction decreased by less than 1%, from 1,272.1 million m³ to 1,261 million m³.

***Table 4.1.1***
***Surface water abstractions (in millions of m³) exceeding 6,000 m³/year or 500 m³/month in 2017***

| River Board, s. e. | Public water supply networks | | Agriculture incl. irrigation | | Energy sector | | Industry incl. extraction | | Others incl. construction industry | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number |
| Elbe | 39.1 | 24 | 9.1 | 55 | 458.2 | 12 | 87.4 | 64 | 2.3 | 87 | **596.2** | **242** |
| Vltava | 140.0 | 38 | 1.7 | 21 | 52.3 | 14 | 25.7 | 63 | 6.6 | 63 | **226.2** | **199** |
| Ohře | 41.2 | 21 | 4.7 | 27 | 43.3 | 10 | 43.0 | 51 | 0.4 | 27 | **132.7** | **136** |
| Oder | 63.8 | 24 | 0.0 | 0 | 12.0 | 16 | 53.4 | 37 | 0.4 | 29 | **129.7** | **106** |
| Morava | 36.4 | 33 | 16.3 | 47 | 111.9 | 9 | 10.6 | 60 | 1.1 | 49 | **176.2** | **198** |
| **Total** | **320.6** | **140** | **31.9** | **150** | **677.8** | **61** | **220.0** | **275** | **10.8** | **255** | **1 261.0** | **881** |

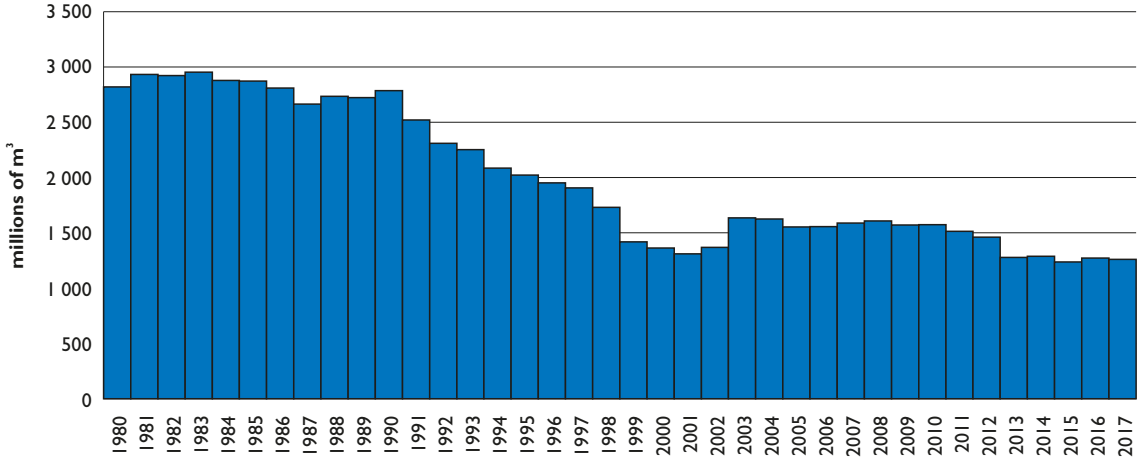
*Source: River Boards, s. e.*
*Note: The published results were calculated using not rounded sums.*

### *Chart 4.1.1*
### *Surface water abstractions in the Czech Republic by industry in 1980–2017*




*Source: T. G. Masaryk Water Research Institute using data provided by River Boards, s. e.*

### *Chart 4.1.2*
### *Surface water abstractions in the Czech Republic in 1980–2017*




*Source: MoA (using data provided by the T. G. Masaryk Water Research Institute, River Boards, s. e.)*

*The Nechranice Dam (source: Ohře River Board, s. e.)*

## 4.2 Groundwater abstractions

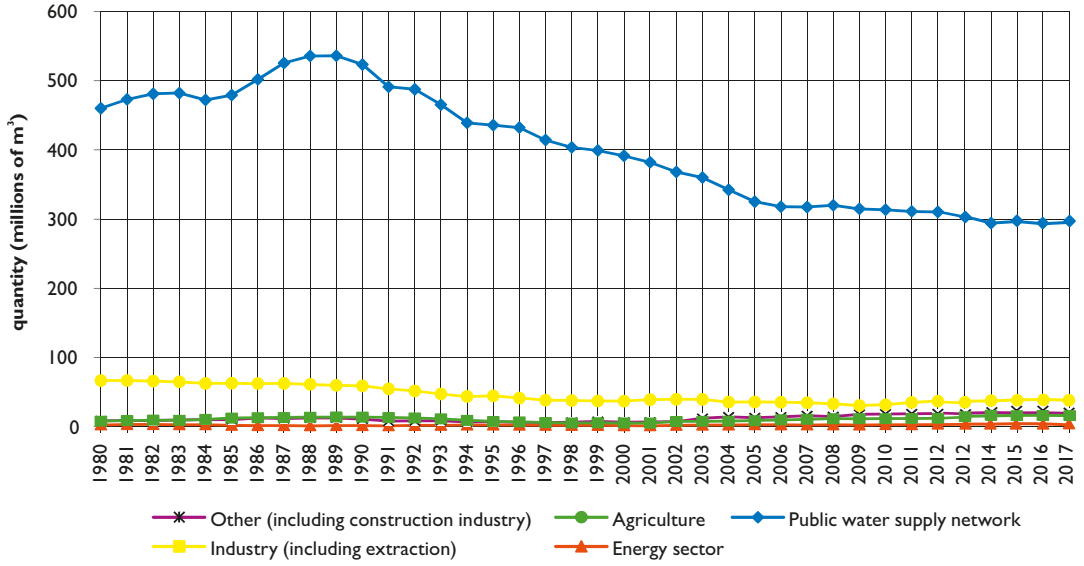
Similarly, the total amount of groundwater abstraction has recently seen only slight fluctuation. While in 2016 there was a slight decrease in the amount of groundwater abstracted to 362.8 million m³, in 2017 there was a slight increase to 369.4 million m³.

*Table 4.2.1*
*Groundwater abstractions (in millions of m³) exceeding 6,000 m³/year or 500 m³/month in 2017*

| River Board | Public water supply networks | | Agriculture incl. irrigation | | Energy sector | | Industry incl. extraction | | Others incl. construction industry and sewerage systems | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number |
| Elbe | 91.7 | 668 | 3.0 | 208 | 0.8 | 8 | 7.9 | 124 | 2.5 | 83 | **105.8** | **1 091** |
| Vltava | 31.9 | 568 | 5.2 | 362 | 0.3 | 9 | 9.8 | 114 | 11.3 | 426 | **58.6** | **1 479** |
| Ohře | 47.2 | 301 | 0.7 | 25 | 0.8 | 7 | 10.4 | 113 | 2.1 | 32 | **61.3** | **478** |
| Oder | 17.0 | 142 | 0.4 | 26 | 0.0 | 0 | 0.9 | 26 | 0.3 | 20 | **18.7** | **214** |
| Morava | 108.3 | 705 | 5.3 | 318 | 0.1 | 6 | 8.3 | 164 | 3.0 | 89 | **125.1** | **1 282** |
| **Total** | **296.1** | **2 384** | **14.7** | **939** | **2.0** | **30** | **37.3** | **541** | **19.3** | **650** | **369.4** | **4 544** |

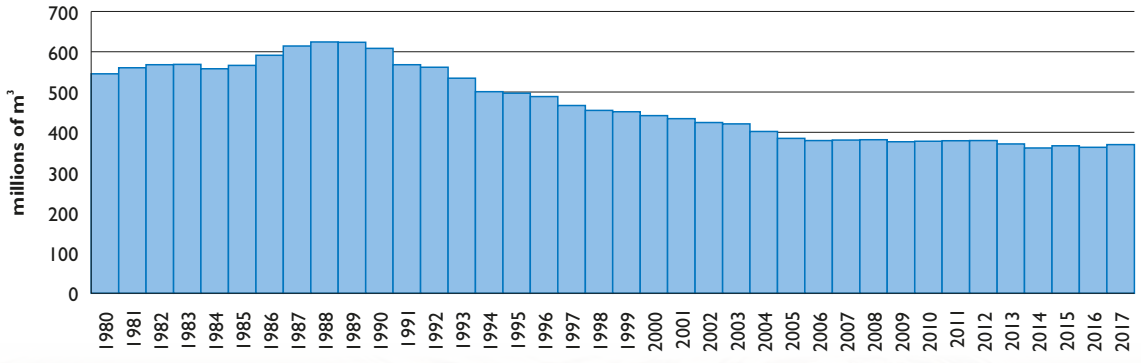
*Source: River Boards, s. e.*
*Note: The published results were calculated using not rounded sums.*

*Chart 4.2.1*
*Groundwater abstractions in the Czech Republic by industry in 1980–2017*




*Source: T. G. Masaryk Water Research Institute using data provided by River Boards, s. e.*

*Chart 4.2.2*
*Groundwater abstractions in the Czech Republic in 1980–2017*




*Source: MoA using data provided by T. G. Masaryk Water Research Institute, River Boards, s. e.*

## 4.3 Waste water discharges

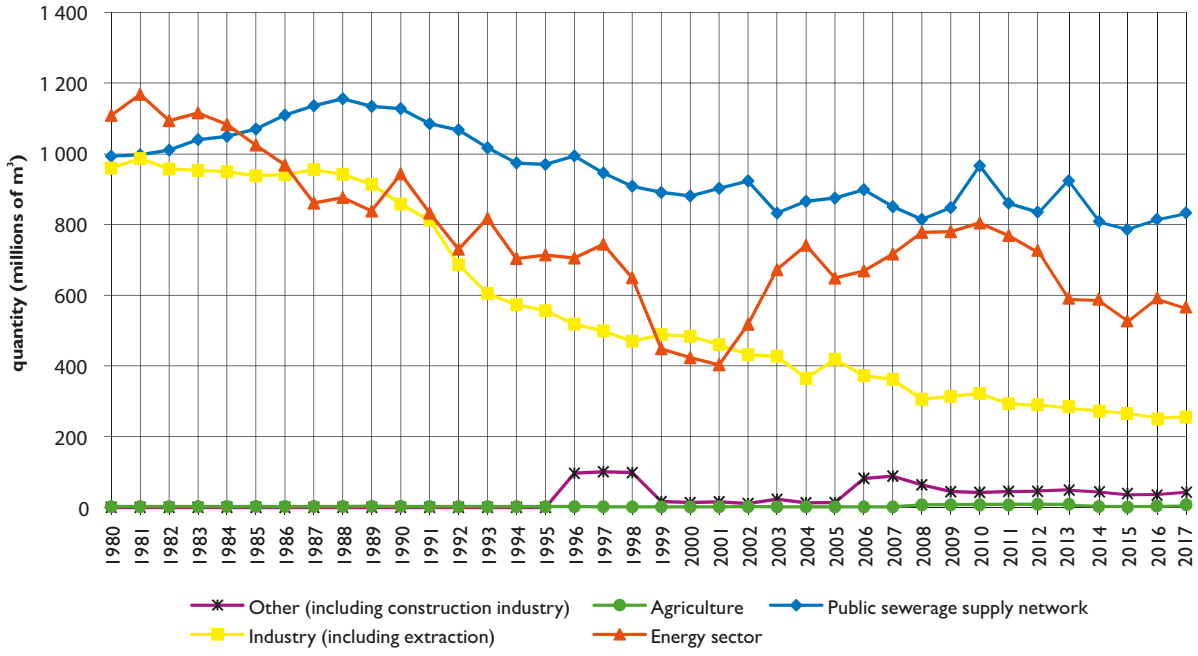
In 2017, in total 1,702.1 million m³ of waste waters and mine waters were discharged into surface waters. Compared to the previous year, this represented a increase of 0.1%. Similarly to the preceding years (with regard to the integration of data provided by the individual River Boards, s. e.) these water discharges did not include waters discharged from fishpond systems.

***Table 4.3.1***
***Discharges of waste waters and mine waters (in millions of m³) into surface waters from sources exceeding 6,000 m³/year or 500 m³/month in 2017***

| River Board | Public sewerage supply network | | Agriculture incl. irrigation | | Energy sector | | Industry incl. extraction | | Others incl. construction industry and public water systems | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number | Volume | Number |
| Elbe | 179.1 | 702 | 0.1 | 4 | 431.2 | 23 | 80.4 | 160 | 2.4 | 56 | **693.2** | **945** |
| Vltava | 269.2 | 749 | 0.7 | 5 | 16.8 | 25 | 30.7 | 144 | 27.1 | 678 | **344.4** | **1 601** |
| Ohře | 81.1 | 282 | 4.1 | 2 | 23.2 | 25 | 73.1 | 148 | 6.1 | 28 | **187.7** | **485** |
| Oder | 102.9 | 306 | 0.0 | 2 | 9.3 | 11 | 55.7 | 74 | 4.8 | 76 | **172.8** | **469** |
| Morava | 199.8 | 1 142 | 0.3 | 6 | 84.4 | 14 | 17.0 | 146 | 2.7 | 76 | **304.1** | **1 384** |
| **Total** | **832.1** | **3 181** | **5.2** | **19** | **564.9** | **98** | **256.9** | **672** | **43.1** | **914** | **1 702.1** | **4 884** |

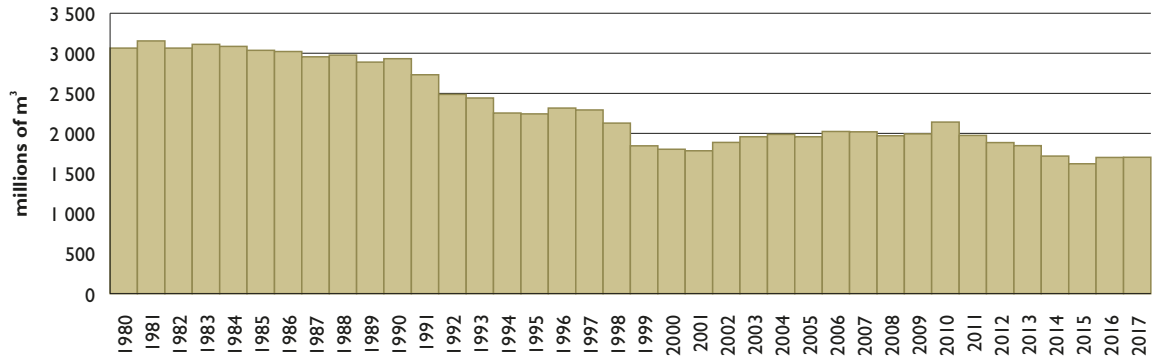
*Source: River Boards, s. e.*
*Note: The published results were calculated using not rounded sums.*

***Chart 4.3.1***
***Discharge of waste waters in the Czech Republic by industry in 1980–2017***




*Source: T. G. Masaryk Water Research Institute using data provided by River Boards, s. e.*

*Chart 4.3.2*
*Discharge of waste waters and mine waters in the Czech Republic in 1980–2017*

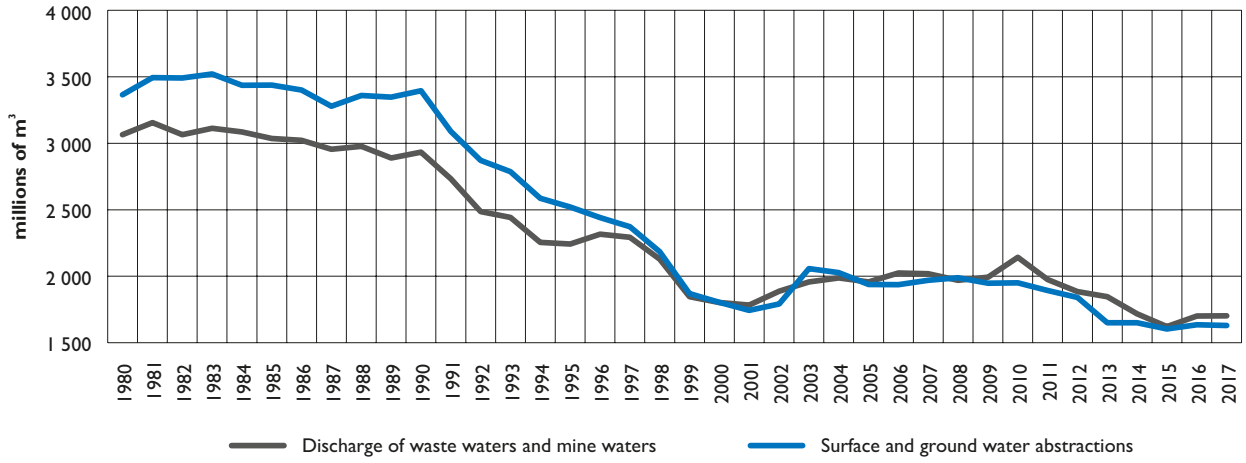



*Source: MoA using data provided by T. G. Masaryk Water Research Institute, River Boards, s. e.*

## 4.4 Comparison of water use

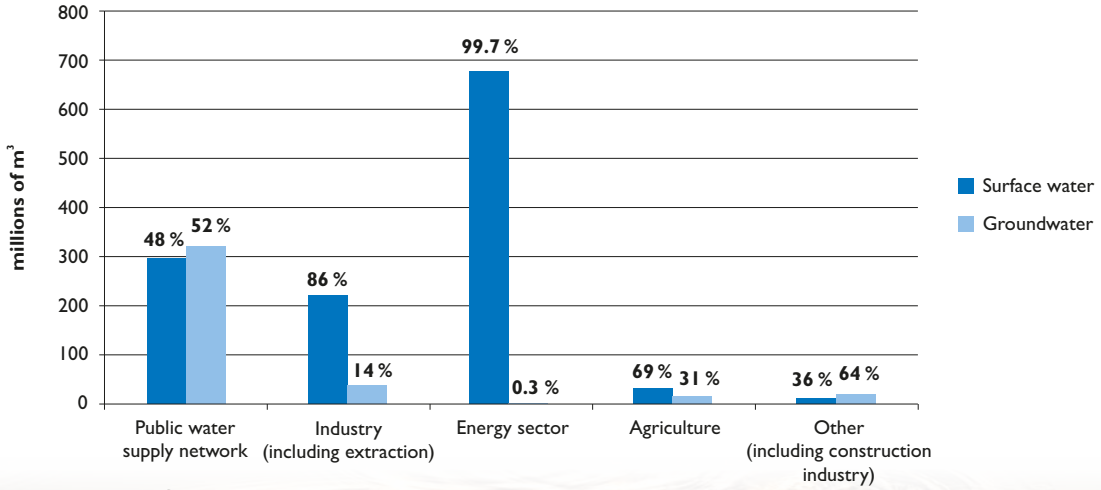
Comparing total volumes of water abstractions and waters discharged in 1980–2017 shows interesting findings concerning water use. There is a distinct drop in abstraction and discharge of waters.

*Chart 4.4.1*
*Water abstractions and discharges in the Czech Republic in 1980–2017*




*Source: MoA using data provided by T. G. Masaryk Water Research Institute, River Boards, s. e.*

*Chart 4.4.2*
*Surface and groundwaters abstractions by industry in 2017*




*Source: MoA using data provided by T. G. Masaryk Water Research Institute, River Boards, s. e.*

*The Elbe River, Neratovice (author: Petra Hubalová)*

# 5. SOURCES OF POLLUTION

## 5.1 Point sources of pollution

Surface water quality is affected primarily by point sources of pollution (municipalities, industrial plants and farms with intensive agricultural animal production). The level of water protection against pollution is most often assessed based on the development of the produced and discharged pollution. In 1990–2017, there was a decrease in the mount of the pollution discharged in $BOD_5$ by 95.6%, $COD_{Cr}$ by 90 % and NM by 94.9%.

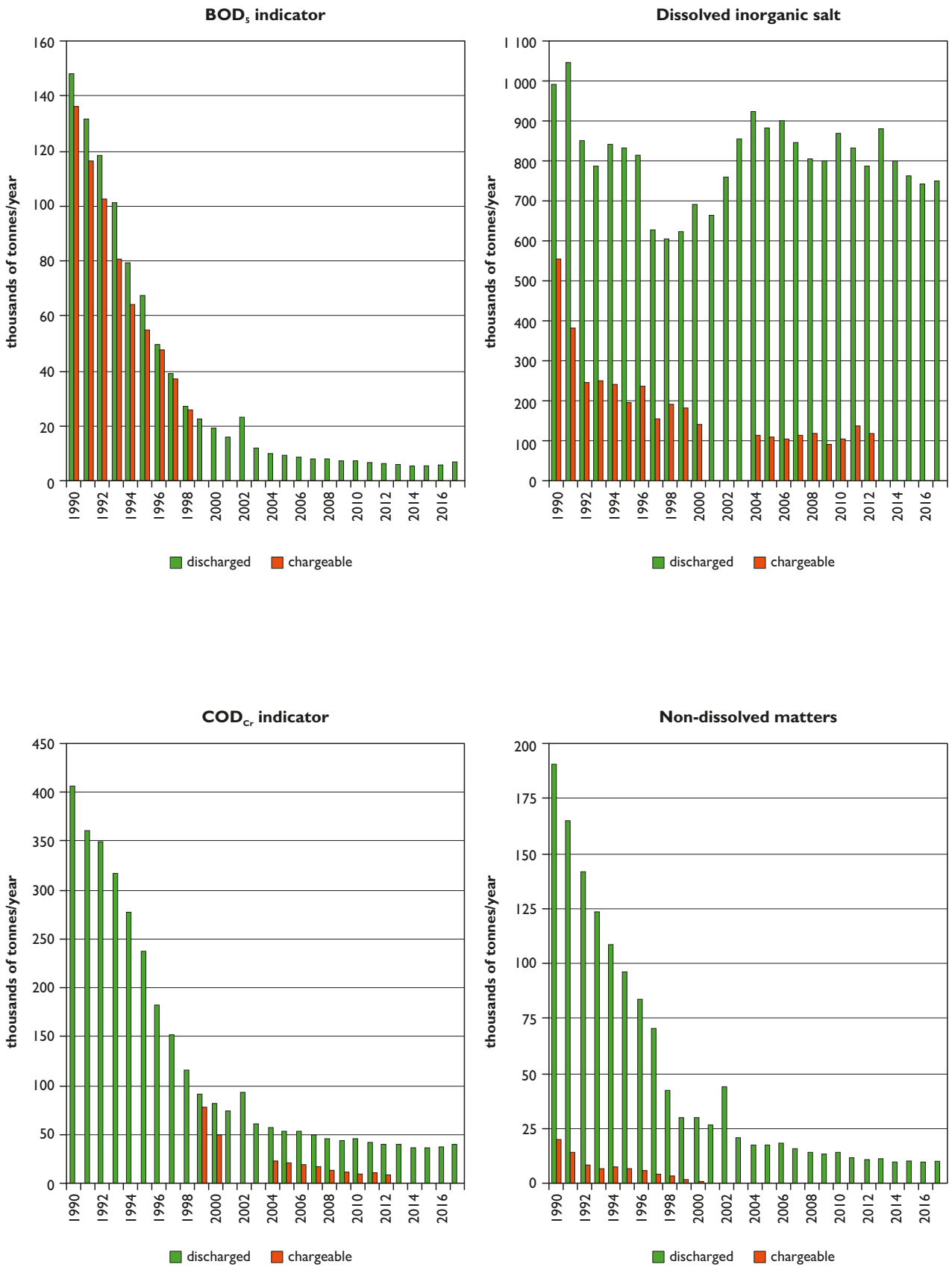
***Table 5.1.1***
***Produced and discharged pollution in 2017***

| River Board, s. e. | Produced pollution in tonnes/year | | | | | | Discharged pollution in tonnes/year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $BOD_5$ | COD | NM | DIS | $N_{inorg}$ | $P_{total}$ | $BOD_5$ | COD | NM | DIS | $N_{inorg}$ | $P_{total}$ |
| Elbe | 51 689 | 128 833 | 54 914 | 200 129 | 7 418 | 1 254 | 1 409 | 10 945 | 2 563 | 198 149 | 2 221 | 217 |
| Vltava | 86 916 | 203 469 | 90 001 | 127 448 | 9 331 | 2 238 | 2 940 | 13 367 | 2 877 | 130 099 | 3 528 | 239 |
| Ohře | 18 088 | 39 583 | 18 995 | 99 499 | 2 261 | 738 | 401 | 3 666 | 1 255 | 98 504 | 1 256 | 246 |
| Oder | 34 330 | 66 203 | 24 325 | 174 234 | 3 697 | 626 | 651 | 5 402 | 1 333 | 194 176 | 1 139 | 116 |
| Morava | 68 063 | 161 958 | 74 879 | 138 527 | 7 584 | 1 638 | 1 193 | 7 154 | 1 607 | 130 513 | 2 019 | 191 |

*Source: T. G. Masaryk Water Research Institute using data provided by the Czech Statistical Office and River Boards, s.e.*

*The Nechranice Dam (source: Ohře River Board, s. e.)*

***Chart 5.1.1***
***Discharged pollution and pollution on which charges were imposed in 1990–2017***




*Source: T. G. Masaryk Water Research Institute using data provided by the Czech Statistical Office and River Boards, s. e.*

## 5.2 Area sources of pollution

Surface water and groundwater quality is also significantly affected by area sources of pollution, in particular the pollution from farming, atmospheric despotions and erosive runoff of the landscape. The proportion of area pollution is increasing in parallel with the continued decrease in point source pollution. The most significant pollution is caused particularly by nitrates, pesticides and acidification, while it is less substantial as regards phosphorus.

### *Erosion of agricultural land*

Currently, the Czech landscape is increasingly exposed to the effect of hydrological extremes (flood episodes caused by extreme rainfall and hydrological drought). The area of the Czech Republic affected by hydrological extremes caused by the change is expected to expand significantly. Farming is one of the key factors that can mitigate the impact of climate changes. 162 erosion episodes were reported in the Czech Republic in 2017, which adds up to a total of 938 episodes.

## 5.3 Accidental pollution

Surface water and groundwater quality is also affected by the adverse impacts of accidental pollution. In 2017, the Czech Environmental Inspection registered in total 134 cases of accidental releases into surface waters and five cases of accidental releases into groundwaters; the total sum of penalties amounted to approx. CZK 29 million.

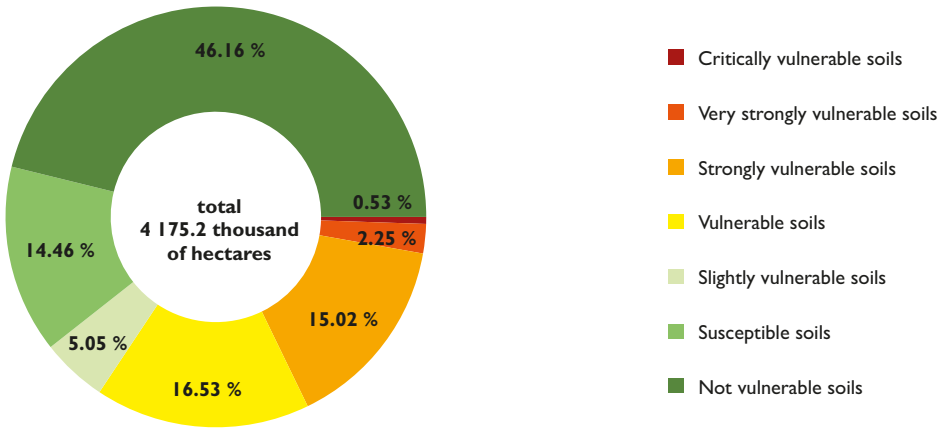
*Water path (source: Ohře River Board, s. e.)*

***Table 5.2.1***
***Erosion of agricultural land***

| Category $C_p \cdot P_p$ | Degree of danger | General description of sowing methods and agrotechnologies | Area in ha |
|---|---|---|---|
| 0.005 and less | Critically vulnerable soils | protective grassing | 22 240.50 |
| 0.006 – 0.020 | Very strongly vulnerable soils | perennial fodder plants or protective grassing | 94 069.66 |
| 0.021 – 0.100 | Strongly vulnerable soils | exclusion of croppers dangerous in terms of erosion and greater share of perennial fodder plants | 627 328.82 |
| 0.101 – 0.200 | Vulnerable soils | exclusion of croppers dangerous in terms of erosion and use of soil-protecting technologies | 690 039.11 |
| 0.201 – 0.240 | Slightly vulnerable soils | alteration of croppers in plants or exclusion of croppers dangerous in terms of erosion | 210 728.23 |
| 0.241 – 0.400 | Susceptible soils | croppers dangerous in terms of erosion are grown using soil-protecting technologies | 603 662.64 |
| 0.401 and more | Not vulnerable soils | No limitations | 1 927 166.56 |
| **Total** | | | **4 175 235.52** |

*Source: Research Institute for Soil and Water Conservation*

***Figure 5.2.1***
***Erosion of agricultural land***




*Source: Research Institute for Soil and Water Conservation*
*Note: Erosion risk expressed in maximum acceptable values of the protective influence of vegetation and anti-erosion measures*

*(source: Shutterstock, author: Kuttelvaserova Stuchelova)*

# 6. WATERCOURSE MANAGEMENT

## 6.1 Professional management of watercourses

The inland position of the Czech Republic in the heart of Central Europe predetermines its relation to the European river network. From the hydrological viewpoint it may be called "the roof of Europe". The basic hydrographic system is constituted by more than 100,000 km of watercourses with both natural and regulated watercourse beds. Watercourses in the Czech Republic are divided according to the Water Act into two categories: significant watercourses and minor watercourses. Professional management of watercourses is carried out in accordance with the provisions of Section 47 of the Water Act.

***Table 6.1.1***
***Professional management of watercourses***

| Category | Administrator | Length of watercourses (km) | |
|---|---|---|---|
| | | 2016 | 2017 |
| Significant watercourses | Elbe River Board, s. e. | 3 586 | 3 589 |
| | Vltava River Board, s. e. | 5 520 | 5 533 |
| | Ohře River Board, s. e. | 2 377 | 2 377 |
| | Oder River Board, s. e. | 1 111 | 1 111 |
| | Morava River Board, s. e. | 3 756 | 3 757 |
| | **Total** | **16 350** | **16 367** |
| Minor watercourses | Forests of the Czech Republic, s. e. | 38 511 | 38 557 |
| | River Boards, s. e., in total | 39 120 | 38 829 |
| | Other administrators [1)] | 5 569 | 5 445 |
| | **Total** | **83 200** | **82 831** |
| **Watercourses in total** | | **99 550** | **99 198** |

*Source: MoA*
*Note: Digital lengths of watercourses from the Central Register of Watercourses are presented.*
*[1)] Including National Park Administrations, the Ministry of Defence (authorities of military districts), municipalities and other natural and legal persons.*

The acquisition value of the non-current tangible assets relating to watercourses amounted in 2017 to CZK 52.56 billion, which is by CZK 0.4 billion more than in the previous year.

*Renovation of the bank protections and banks of Bat'a canal, Vnorovy, October 2017 (source: Morava River Board, s. e.)*

***Table 6.1.2***
***Acquisition value of non-current tangible assets relating to watercourses***

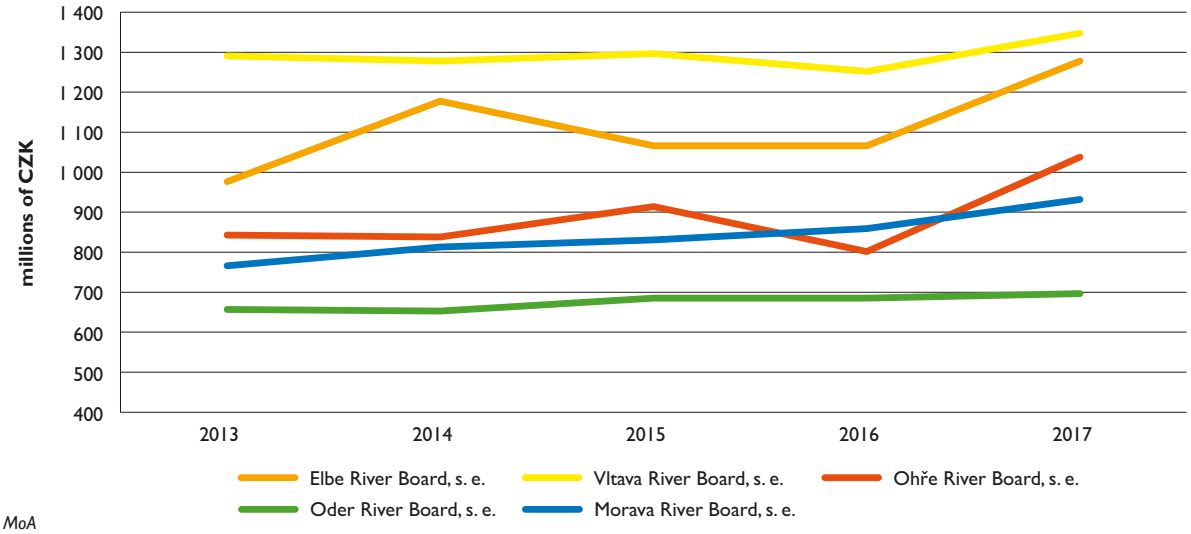
| Watercourse administrators | 2016 | 2017 |
|---|---|---|
| | billions of CZK | |
| Elbe River Board, s. e. | 10.48 | 10.56 |
| Vltava River Board, s. e. | 10.96 | 11.03 |
| Ohře River Board, s. e. | 10.10 | 10.18 |
| Oder River Board, s. e. | 6.10 | 6.19 |
| Morava River Board, s. e. | 8.60 | 8.60 |
| **Total River Boards, s. e.** | **46.24** | **46.56** |
| Forests of the Czech Republic, s. e. | 5.92 | 6.00 |
| **Total** | **52.16** | **52.56** |

*Source: MoA*

## 6.2 River Boards, state enterprises

In 2017, the total revenues generated by River Boards, state enterprises, compared to 2016, increased by more than CZK 559 million, reaching a year-on-year increase of 11.8%. The increase was generated especially by the following items: electric energy generation, payments for surface water abstractions, other revenues and other operational grants.

### *Chart 6.2.1*
### *Revenues of River Boards, state enterprises, in 2013–2017*



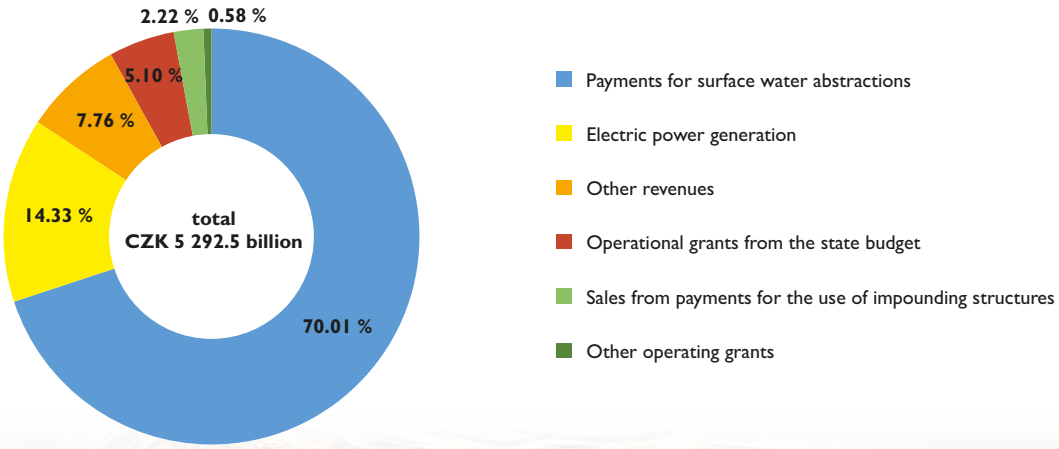

*Source: MoA*

### *Table 6.2.1*
### *Structure of the revenues of River Boards, state enterprises, in 2017*

| Indicator | River Boards, state enterprises | | | | | Total |
|---|---|---|---|---|---|---|
| | Elbe | Vltava | Ohře | Oder | Morava | |
| | thousands of CZK | | | | | |
| Payments for surface water abstractions | 1 001 011 | 831 500 | 604 358 | 553 682 | 714 673 | **3 705 224** |
| Electric power generation | 64 024 | 276 114 | 329 461*) | 62 942 | 26 039 | **758 580** |
| Sales from payments for the use of impounding structures | 6 900 | 102 963 | 2 626 | 0 | 4 956 | **117 445** |
| Other revenues | 149 163**) | 78 738 | 85 264 | 49 013 | 48 388 | **410 566** |
| Operational grants from the state budget 1) | 30 881 | 57 545 | 16 398 | 31 104 | 134 168 | **270 096** |
| Other operating grants | 26 000 | 911 | 0 | 0 | 3 712 2) | **30 623** |
| **River Boards, s. e., in total** | **1 277 979** | **1 347 771** | **1 038 107** | **696 741** | **931 936** | **5 292 534** |

*Source: River Boards, s. e.*
*Note: *) The item includes revenue from photovoltaic power plants.*
***) The item includes revenue from the sale of an Oberbank AG security amounting to CZK 50 million.*
*1) All operational grants for minor watercourses and subsidies from the State Fund for Transport Infrastructure*
*2) Other operational grants include an estimate of costs expended in 2017 amounting to CZK 82 thousand; this sum is not included among grant revenues received in 2017, but in an estimate for previous years amounting to CZK 635 thousand.*

### *Chart 6.2.2*
### *Structure of the revenues of River Boards, state enterprises, in 2017*



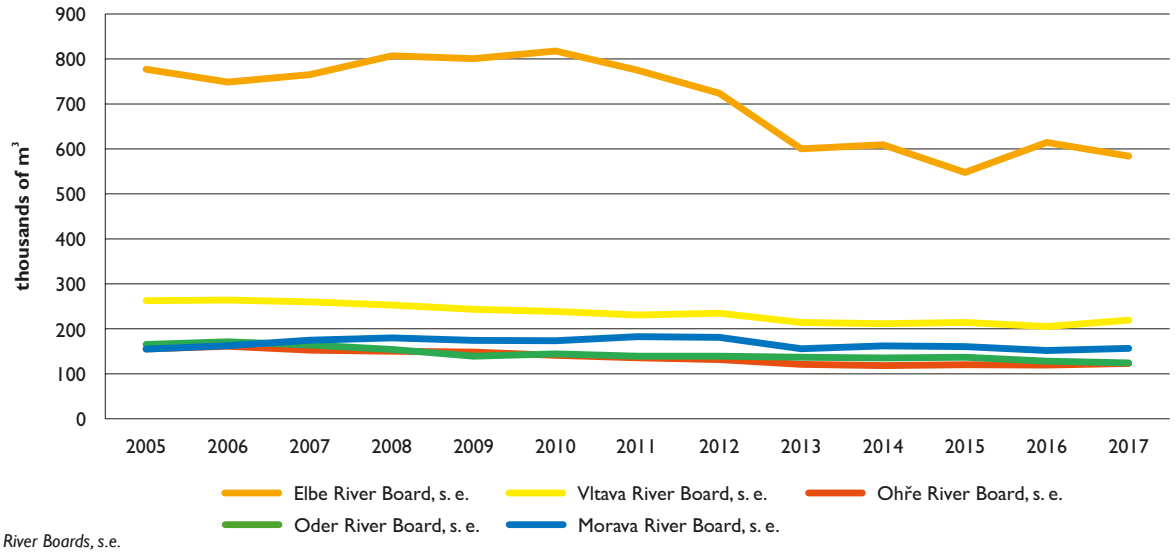

*Source: MoA*

### *Table 6.2.2*
### *Surface water supplies charged for administered by River Boards, state enterprises, in 2011–2017*

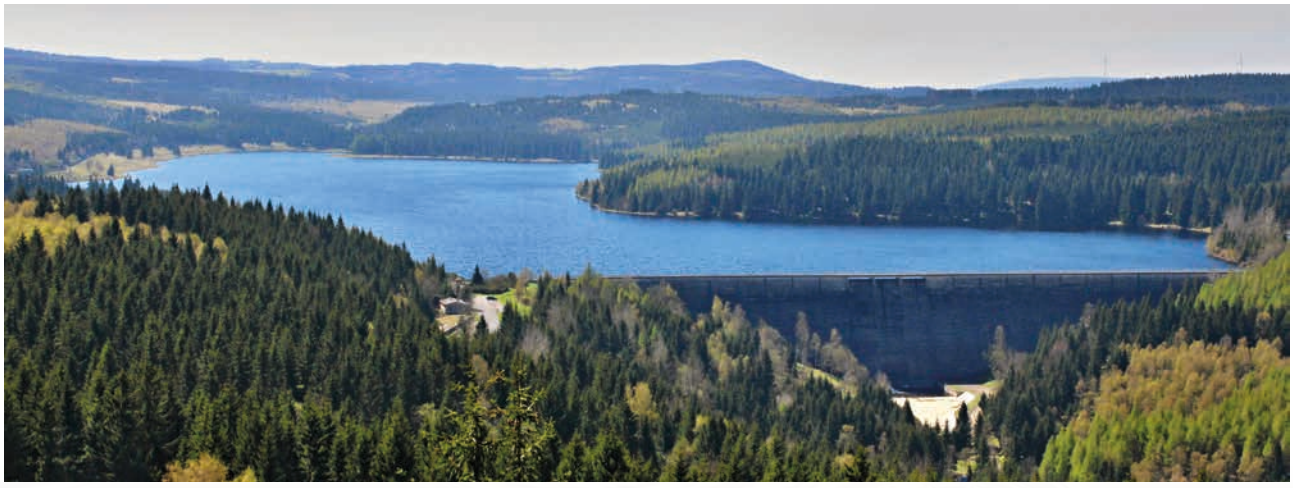
| River Board, s. e. | | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| | | thousands of m³ | | | | | | |
| Elbe | a) | 775 223 | 723 608 | 600 131 | 609 118 | 547 658 | 614 377 | 583 838 |
| | b) | 37 892 | 34 838 | 35 782 | 36 022 | 37 271 | 37 707 | 38 873 |
| Vltava | a) | 230 817 | 234 579 | 214 195 | 211 473 | 213 944 | 204 885 | 219 138 |
| | b) | 140 087 | 140 596 | 134 750 | 130 214 | 134 544 | 134 333 | 139 485 |
| Ohře | a) | 135 730 | 131 659 | 121 167 | 118 390 | 120 352 | 119 384 | 122 837 |
| | b) | 46 162 | 44 954 | 42 212 | 40 583 | 40 777 | 40 305 | 40 953 |
| Oder | a) | 138 942 | 139 124 | 136 614 | 135 223 | 136 832 | 127 995 | 124 144 |
| | b) | 64 179 | 67 102 | 65 105 | 64 920 | 65 045 | 62 306 | 60 592 |
| Morava | a) | 182 361 | 180 835 | 155 848 | 162 058 | 160 288 | 151 857 | 156 666 |
| | b) | 31 861 | 33 427 | 30 951 | 32 262 | 32 975 | 32 816 | 35 763 |
| **Total** | **a)** | **1 463 073** | **1 409 805** | **1 227 955** | **1 236 262** | **1 179 074** | **1 218 498** | **1 206 623** |
| | | **320 181** | **320 917** | **308 800** | **304 001** | **310 612** | **307 467** | **315 666** |

*Source: River Boards, s. e.*
*Note: a) charged for in total,*
*b) of which for public water supply systems.*

### *Chart 6.2.3*
### *Surface water supplies charged for administered by River Boards, state enterprises, in 2005–2017*

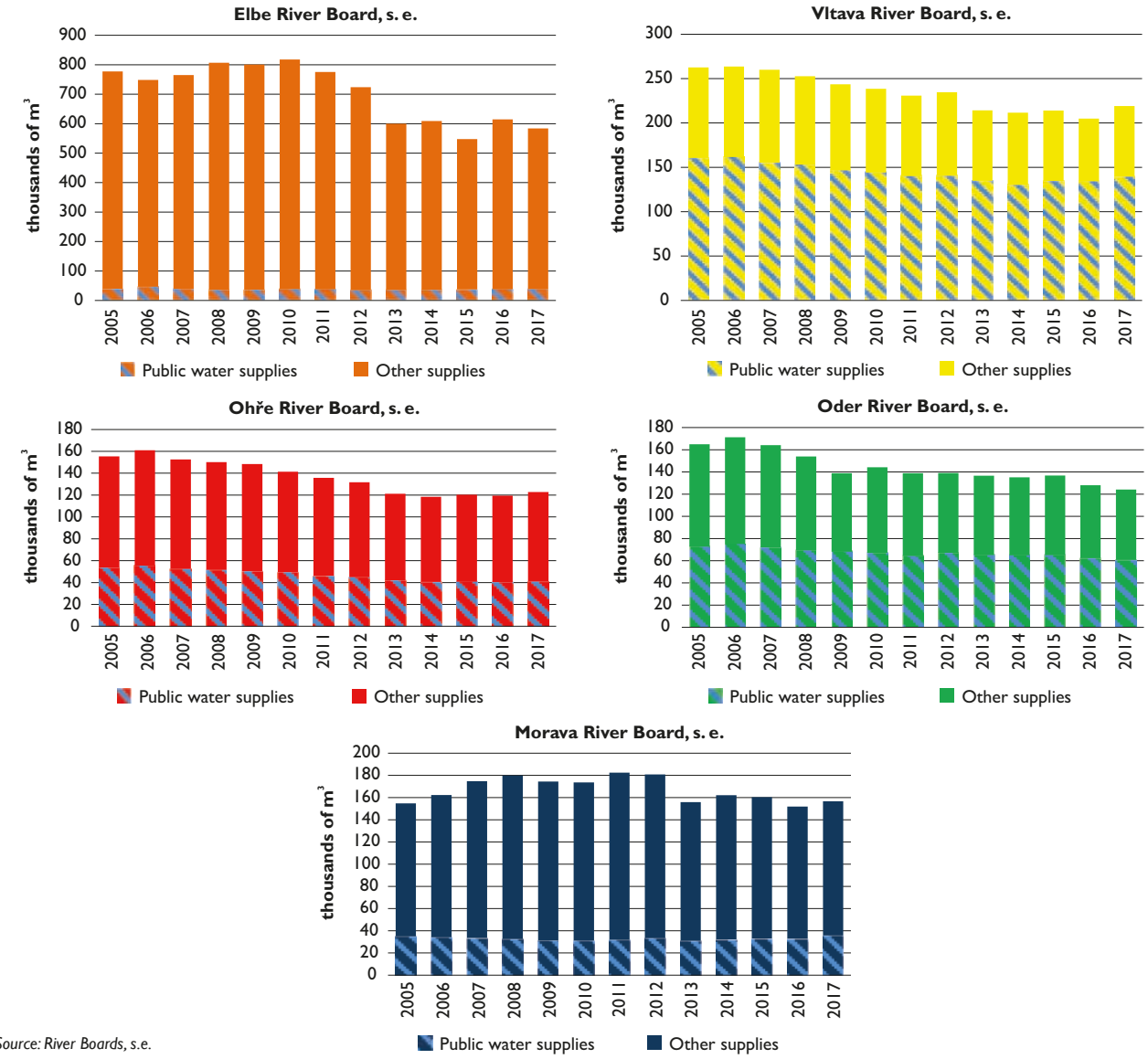



*Source: River Boards, s.e.*



*The Fláje Dam (source: Ohře River Board, s. e.)*

***Chart 6.2.4***
***Comparison of surface water supplies charged for administered by River Boards, state enterprises, in 2005–2017***




*Source: River Boards, s.e.*

*The Weir and the Canal lock Spytihněv (author: Tomáš Daňhel)*

In River Boards, state enterprises, the average price of other surface water abstractions in 2017 was CZK 4.90 per m³, this means an increase by 5.5% compared to the previous year. This price is "factually regulated" price, which may only include economically justified costs, reasonable profit and the tax pursuant to the relevant tax regulations.

In 2017, revenues from surface water abstractions increased in absolute figures by CZK 179 million, which means there was a year-on-year increase in this revenue by 5.1%. The total revenues from surface waters abstractions in 2017 amounted to CZK 3.71 billion.

*The Naděje Dam (source: Ohře River Board, s. e.)*

***Table 6.2.3***
***Price for abstractions used for flow cooling in 2011–2017***

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | CZK/m³ | | | | | | |
| Elbe | 0.60 | 0.64 | 0.65 | 0.68 | 0.70 | 0.72 | 0.74 |
| Vltava | 1.13 | 1.22 | 1.22 | 1.25 | 1.25 | 1.27 | 1.32 |
| Morava | 0.67 | 0.72 | 0.89 | 1.15 | 1.19 | 1.21 | 1.22 |

*Source: River Boards, s. e.*
*Note: The unit price per m³ does not include value added tax.*

***Table 6.2.4***
***Price for other surface water abstractions in 2011–2017***

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | CZK/m³ | | | | | | |
| Elbe | 3.63 | 3.97 | 4.09 | 4.29 | 4.39 | 4.49 | 4.58 |
| Vltava | 3.15 | 3.40 | 3.45 | 3.55 | 3.62 | 3.69 | 3.84 |
| Ohře | 3.53 | 3.88 | 4.14 | 4.34 | 4.51 | 4.69 | 4.92 |
| Oder | 3.58 | 3.80 | 3.99 | 4.09 | 4.21 | 4.33 | 4.46 |
| Morava | 5.47 | 5.88 | 6.16 | 6.39 | 6.52 | 6.65 | 6.68 |
| **Average price** *) | **3.61** | **3.94** | **4.08** | **4.25** | **4.34** | **4.64** | **4.90** |

*Source: River Boards, s. e.*
*Note: The unit price per m³ does not include value added tax.*
*) *Calculated using weighted average.*

***Table 6.2.5***
***Payments for surface water abstractions in 2011–2017***

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | in millions of CZK | | | | | | |
| Elbe | 846 | 890 | 832 | 882 | 860 | 996 | 1 001 |
| Vltava | 707 | 778 | 725 | 739 | 759 | 745 | 832 |
| Ohře | 479 | 511 | 502 | 514 | 543 | 560 | 604 |
| Oder | 497 | 529 | 545 | 553 | 576 | 554 | 554 |
| Morava | 543 | 608 | 589 | 639 | 637 | 672 | 715 |
| **Total** | **3 072** | **3 316** | **3 193** | **3 327** | **3 375** | **3 527** | **3 706** |

*Source: River Boards, s. e.*

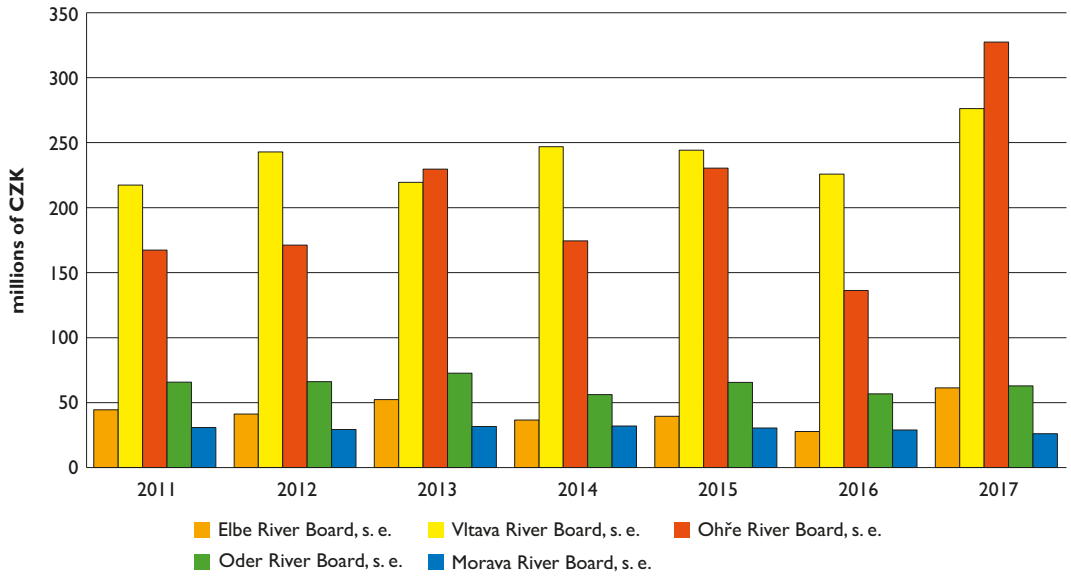
Electric energy generation is the second most significant source of revenues of River Boards, s. e., (the most significant revenue source being surface water abstractions) and it represents more than 14% of total revenues. The number of small power plant increased by a single one, which means that in 2017 there were 99 small power plants in operation. Total revenues under this item exceeded CZK 753 million.

***Table 6.2.6***
***Number of small hydroelectric power plants owned by River Boards, state enterprises, in 2011–2017***

| River Board, s. e. | Indicator | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| Elbe | Number of small hydroelectric plants | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | Installed capacity in kW | 5 892 | 6 108 | 6 438 | 6 438 | 6 438 | 6 795 | 6 819 |
| | Electric power generation in MWh | 20 871 | 19 293 | 23 509 | 16 349 | 15 880 | 12 288 | 22 440 |
| | Sales in thousands of CZK | 44 387 | 41 222 | 52 257 | 36 532 | 39 390 | 27 754 | 61 268 |
| Vltava | Number of small hydroelectric plants | 18 | 19 | 19 | 19 | 19 | 19 | 19 |
| | Installed capacity in kW | 21 341 | 21 607 | 21 816 | 22 016 | 22 016 | 22 128 | 22 128 |
| | Electric power generation in MWh | 93 459 | 96 937 | 86 749 | 92 102 | 88 474 | 99 497 | 77 475 |
| | Sales in thousands of CZK | 217 348 | 242 709 | 219 464 | 246 837 | 244 146 | 225 704 | 276 114 |
| Ohře | Number of small hydroelectric plants | 21 | 21 | 21 | 21 | 21 | 21 | 22 |
| | Installed capacity in kW | 16 930 | 16 930 | 16 930 | 16 966 | 16 966 | 16 966 | 17 091 |
| | Electric power generation in MWh | 81 134 | 77 422 | 102 642 | 67 371 | 84 954 | 84 910 | 84 244 |
| | Sales in thousands of CZK | 167 297 | 171 112 | 229 545 | 174 342 | 230 236 | 136 223 | 327 221 |
| Oder | Number of small hydroelectric plants | 16 | 16 | 16 | 16 | 16 | 23 | 23 |
| | Installed capacity in kW | 5 731 | 5 809 | 5 809 | 5 809 | 5 809 | 6 236 | 6 236 |
| | Electric power generation in MWh | 28 113 | 26 068 | 27 201 | 20 656 | 24 535 | 21 569 | 23 181 |
| | Sales in thousands of CZK | 65 682 | 66 000 | 72 506 | 56 006 | 65 509 | 56 669 | 62 942 |
| Morava | Number of small hydroelectric plants | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | Installed capacity in kW | 3 495 | 3 497 | 3 497 | 3 497 | 3 497 | 3 497 | 3 497 |
| | Electric power generation in MWh | 12 607 | 11 323 | 12 228 | 12 343 | 11 535 | 11 008 | 9 609 |
| | Sales in thousands of CZK | 30 831 | 29 331 | 31 592 | 32 014 | 30432 | 28 812 | 26 039 |
| **Total** | **Number of small hydroelectric plants** | **90** | **91** | **91** | **91** | **91** | **98** | **99** |
| | **Installed capacity in kW** | **53 389** | **53 951** | **54 490** | **54 726** | **54 726** | **55 622** | **55 771** |
| | **Electric power generation in MWh** | **236 184** | **231 043** | **252 329** | **208 821** | **225 378** | **229 272** | **216 949** |
| | **Sales in thousands of CZK** | **525 545** | **550 374** | **605 364** | **545 731** | **609 713** | **475 162** | **753 455** |

*Source: River Boards, s. e.*

***Chart 6.2.5***
***Development of revenues of small hydroelectric power plants owned by River Boards, state enterprises, in 2011–2017***




*Source: River Boards, s. e.*

Other revenues include a list of less significant items such as income from lease of land, non-residential premises and water surfaces and from other business activities. When comparing 2017 with the two previous years, there was an increase in other revenues by CZK 92 million, totalling to CZK 410 million.

***Table 6.2.7***
***Other revenues of River Boards, state enterprises, in 2011–2017***

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | in thousands of CZK | | | | | | |
| Elbe | 80 646 | 98 258 | 83 184 | 147 863 | 86 346 | 73 388 | 149 163*) |
| Vltava | 103 820 | 109 261 | 144 774 | 92 183 | 93 132 | 71 409 | 78 738 |
| Ohře | 109 694 | 94 847 | 90 474 | 107 668 | 79 965 | 75 702 | 85 264 |
| Oder | 93 210 | 48 316 | 39 639 | 43 802 | 43 221 | 41 191 | 49 013 |
| Morava | 50 719 | 62 345 | 74 491 | 53 933 | 57 799 | 56 462 | 48 295 |
| **Total** | **438 089** | **413 027** | **432 562** | **445 449** | **360 463** | **318 152** | **410 473** |

*Source: River Boards, s. e.*
*Note: *) The item includes revenue from the sale of an Oberbank AG security amounting to CZK 50 million.*

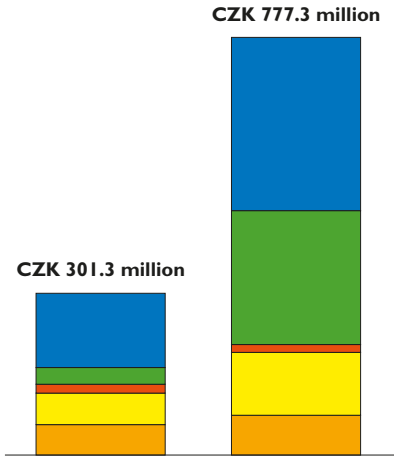
*The Nechranice Dam (source: Ohře River Board, s. e.)*

In order to cover financial needs regarding the key activities of River Boards, state enterprises, a lot of operational and investment grants are used every year. The total amount of grants in 2017 was CZK 1.08 billion which means an increase of almost 23%.

Compared to 2016, the total costs in 2017 increased by CZK 417.5 million, i.e. the year-on-year increase was 9.2%. The most significant year-on-year increase was in two items – financial costs and repairs.

*The Bílina River (source: Ohře River Board, s. e.)*

***Chart 6.2.6***
***Grants used by River Boards, state enterprises, in 2017***




| | Operational grants (million of CZK) | Investment grants (million of CZK) |
|---|---|---|
| Morava River Board, s. e. | 138.435 | 322.273 |
| Oder River Board, s. e. | 31.104 | 249.340 |
| Ohře River Board, s. e. | 16.398 | 14.531 |
| Vltava River Board, s. e. | 58.456 | 117.010 |
| Elbe River Board, s. e. | 56.881 | 74.106 |

*Source: MoA, River Boards, s. e.*

***Table 6.2.8***
***Costs of River Boards, state enterprises, in 2016 and 2017***

| Type of cost | Year | River Boards, state enterprises | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | Elbe | Vltava | Ohře | Oder | Morava | |
| | | millions of CZK | | | | | |
| Depreciation | 2016 | 159.0 | 321.9 | 190.1 | 147.1 | 165.8 | **983.9** |
| | 2017 | 198.8 | 341.3 | 183.7 | 151.9 | 173.5 | **1 049.2** |
| Repairs | 2016 | 218.6 | 292.3 | 153.3 | 152.3 | 130.7 | **947.1** |
| | 2017 | 244.7 | 271.4 | 167.6 | 169.1 | 303.4 | **1 156.3** |
| Material | 2016 | 41.1 | 28.7 | 15.4 | 32.0 | 46.2 | **163.4** |
| | 2017 | 41.0 | 28.6 | 16.9 | 33.7 | 45.3 | **165.5** |
| Energy and fuel | 2016 | 32.7 | 34.6 | 21.0 | 5.0 | 11.4 | **104.6** |
| | 2017 | 35.2 | 36.5 | 24.1 | 4.9 | 11.8 | **112.5** |
| Personnel costs | 2016 | 491.4 | 447.0 | 338.7 | 248.1 | 344.5 | **1 869.7** |
| | 2017 | 509.0 | 454.5 | 352.2 | 257.1 | 367.1 | **1 939.9** |
| Services | 2016 | 60.2 | 83.3 | 27.5 | 32.5 | 32.4 | **235.9** |
| | 2017 | 70.1 | 85.5 | 30.5 | 31.9 | 30.2 | **248.3** |
| Financial costs | 2016 | 0.8 | 0.7 | 0.1 | 0.2 | 0.4 | **2.2** |
| | 2017 | 50.0*) | 0.4 | 1.1 | 0.2 | 0.3 | **52.0** |
| Other costs | 2016 | 120.1 | 29.6 | 28.6 | 36.3 | 14.9 | **229.5** |
| | 2017 | 68.9 | 55.7 | 92.2 | 25.6 | -11.4 | **231.0** |
| **Total costs** | **2016** | **1 123.9** | **1 238.1** | **774.6** | **654.3** | **746.3** | **4 537.2** |
| | **2017** | **1 217.7** | **1273.9** | **868.5** | **674.4** | **920.2** | **4 954.7** |

*Source: River Boards, s. e.*
*Note: *) The item includes retirement of an Oberbank AG security that was subsequently sold. Common financial costs in 2017 amounted to CZK 397 thousand.*

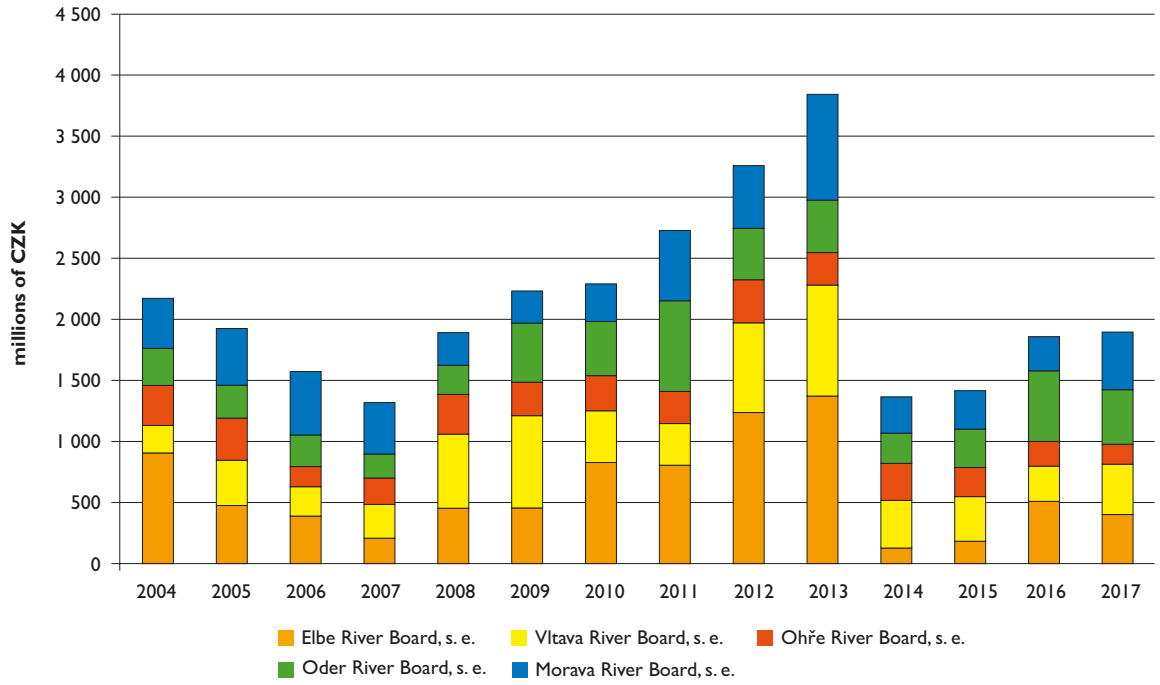
In 2017, River Boards, s. e., expended on investments CZK 1.89 billion, of which 57% (CZK 1.08 billion) was used from their own resources and almost 43% (amounting to CZK 0.81 billion) of investment funds were covered by external financial resources.

***Table 6.2.9***
***Investments made by River Boards, state enterprises, in 2011–2017***

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | millions of CZK | | | | | | |
| Elbe | 806.7 | 1 240.8 | 1 378.3 | 132.6 | 189.9 | 514.6 | 401.2 |
| Vltava | 346.7 | 729.5 | 905.2 | 386.7 | 361.5 | 286.0 | 410.9 |
| Ohře | 265.8 | 357.1 | 262.5 | 306.7 | 242.5 | 210.7 | 161.6 |
| Oder | 741.2 | 419.7 | 435.4 | 248.4 | 313.7 | 568.2 | 453.4 |
| Morava | 571.9 | 512.0 | 856.0 | 290.4 | 314.5 | 283.7 | 468.0 |
| **Total** | **2 732.3** | **3 259.0** | **3 837.4** | **1 364.8** | **1 422.1** | **1 863.2** | **1 895.1** |

*Source: River Boards, s. e.*

***Chart 6.2.7***
***Development of capital construction in River Boards, state enterprises, in 2004–2017***

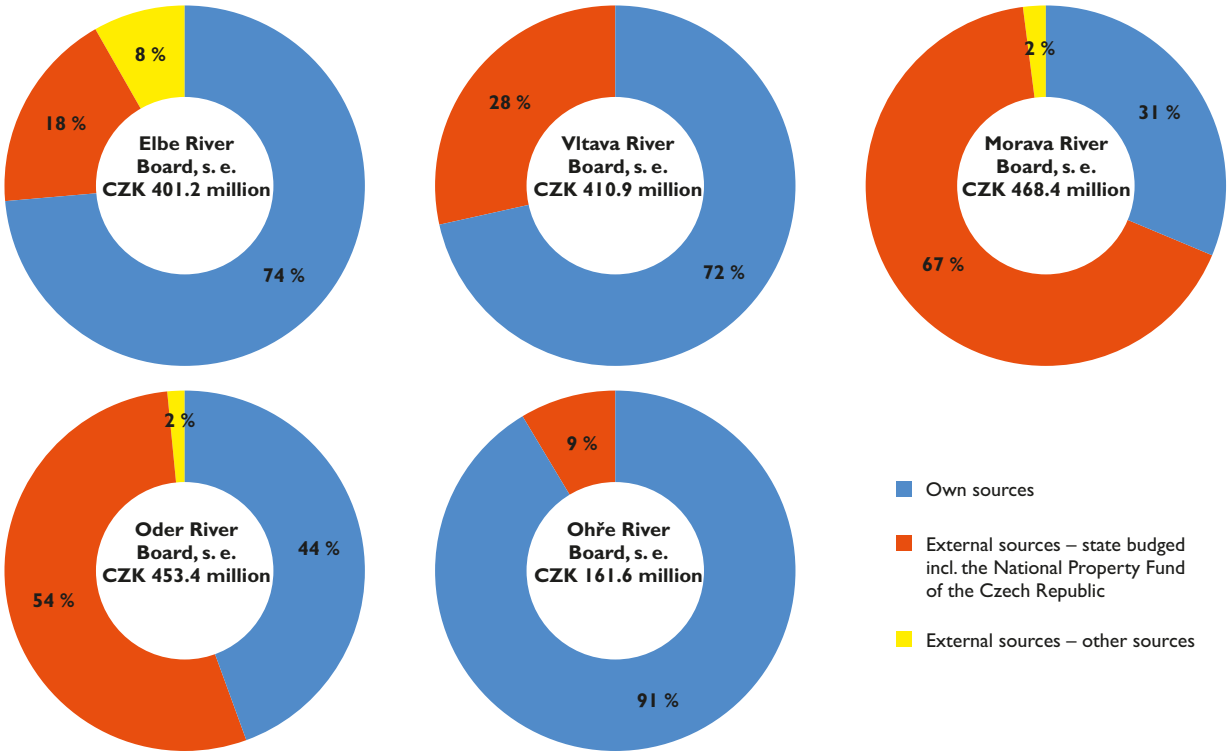



*Source: MoA, River Boards, s. e.*

*The Berounka River – Repairing of Dolphin (source: Vltava River Board, s. e.)*

*Dry Reservoir Jelení (source: Oder River Board, s. e.)*

***Chart 6.2.8***
***Structure of the use of investment funds by resource types in River Boards, state enterprises, in 2017***




*Source: MoA, River Boards, s. e.*

The financial results reached by all River Boards, state enterprises, showed only a profit. In 2017, River Boards, state enterprises, achieved a profit totalling to almost CZK 338 million. In comparison with the previous year the profit grew by almost 72% (CZK 141 million).

As compared with 2016, there was a decrease in the number of employees in River Boards, state enterprises, in 2017 by ten employees to a total of 3,565 employees.

The average monthly salary in River Boards, state enterprises, in 2017 grew on average by 2.9% to CZK 32,431.

Inspecting activity of River Boards, state enterprises is regularly performed by relevant inspecting bodies. In 2017, there was a total of 92 inspections, of which two inspections are still under way. The inspections have not detected any deficiencies.

*The Kadaň Dam (source: Ohře River Board, s. e.)*

*Table 6.2.10*
*Economic results of River Boards, state enterprises, in 2011–2017 (profit, loss)*

| River Board, s. e. | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | in thousands of CZK | | | | | | |
| Elbe | 29 908 | 21 488 | 770 | 12 100 | 16 471 | 22 026 | 60 276 |
| Vltava | 12 702 | 25 088 | 14 495 | 16 022 | 16 038 | 13 711 | 73 880 |
| Ohře | 4 758 | 11 284 | 12 624 | 13 008 | 20 300 | 27 422 | 169 652 |
| Oder | 12 721 | 15 247 | 16 603 | 13 718 | 12 495 | 20 845 | 22 291 |
| Morava | 5 355 | 5 114 | 6 200 | 7 786 | 18 830 | 112 916 | 11 721 |
| **Total River Boards, s. e.** | **65 444** | **78 221** | **50 692** | **62 634** | **84 134** | **196 920** | **337 820** |

*Source: River Boards, s. e.*

## 6.3 Forests of the Czech Republic, state enterprise

Forests of the Czech Republic, state enterprise, carries out the management of specified minor watercourses and torrents as one of non-production forest functions. In 2017, it administered more than 38.6 thousand km of watercourses, which accounts for almost 47% of minor watercourses in the Czech Republic.

In connection with the management of watercourses, Forests of the Czech Republic, state enterprise, disbursed through its organizational units (Water Administrators) a total of CZK 547.6 million in 2017.

Revenues obtained for surface water abstractions to cover the management of watercourses amounted to CZK 15.1 million in 2017.

*Table 6.3.1*
*Forests of the Czech Republic, state enterprise – funding structure – watercourse management in 2017 (total costs)*

| Projects | Total | Own sources in total | Grants in total |
|---|---|---|---|
| | millions of CZK | | |
| Investments | 201.9 | 103.2 | 98.7 |
| | | Of which flood damage | |
| | | 8.6 | 10.7 |
| Non-investments | 345.7 | 325.9 | 19.8 |
| | | Of which flood damage | |
| | | 14.8 | 1.1 |
| **Total** | **547.6** | **429.1** | **118.5** |
| | | **Of which flood damage** | |
| | | **23.4** | **11.8** |

*Source: Forests of the Czech Republic, s. e.*

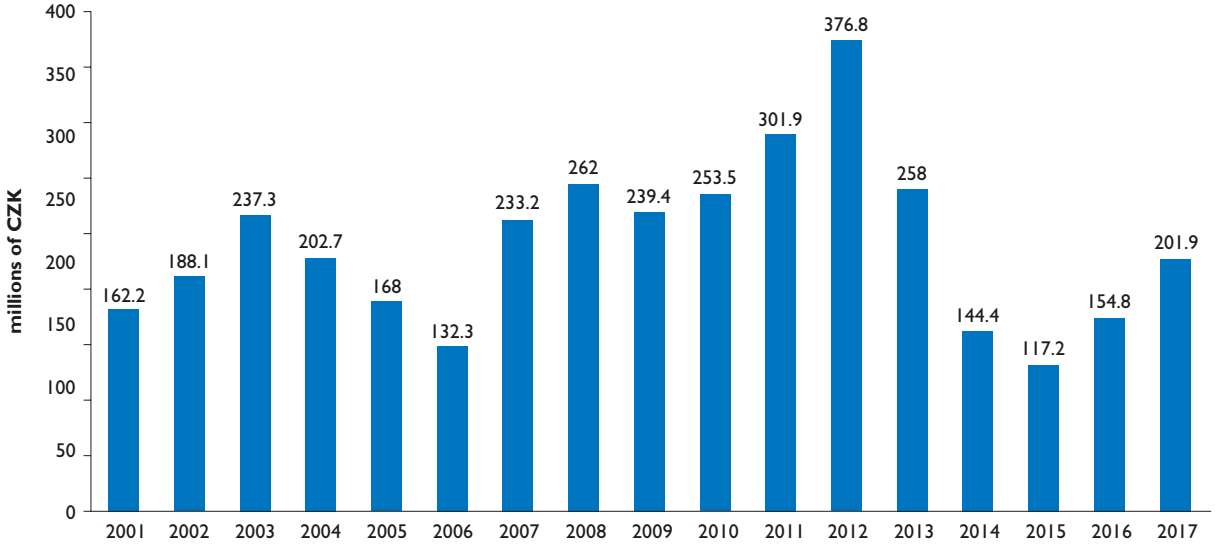
*The Satina River (source: Forest of the Czech Republic, s. e.)*

*Table 6.3.2*
*Forests of the Czech Republic, state enterprise – revenues for surface water in 2011–2017*

| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|
| | thousands of CZK | | | | | | |
| **Revenues** | 12 969 | 13 679 | 12 211 | 11 544 | 10 682 | 13 192 | 15 106 |
| **Price per m³ *)** | 1.9 | 1.96 | 2.00 | 2.05 | 2.06 | 2.26 | 2.52 |

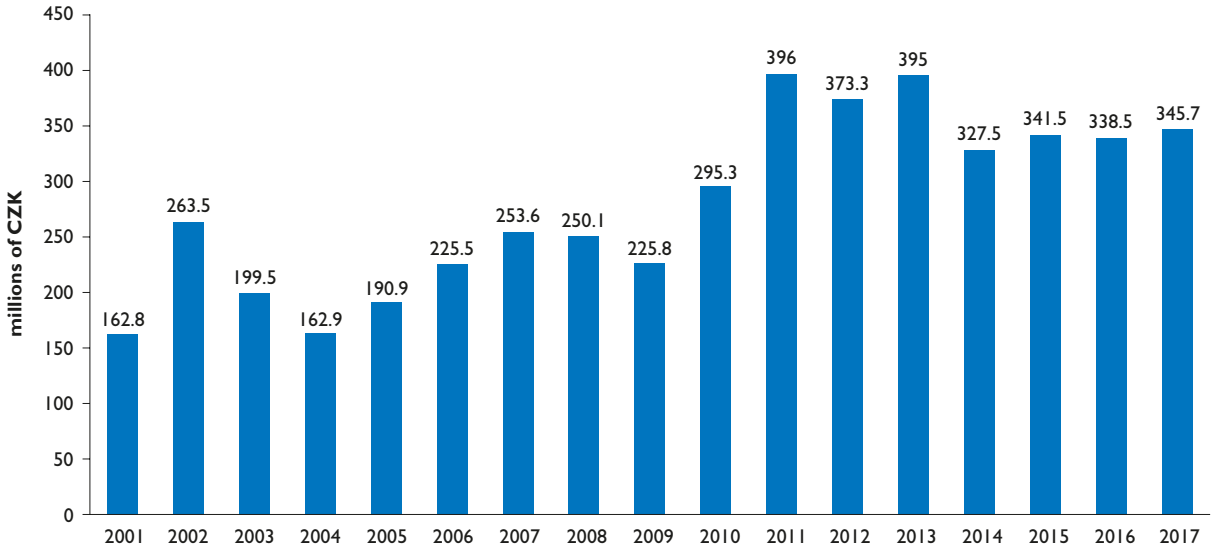
*Source: Forests of the Czech Republic, s. e.*
*Note: *) Unit price per m³ excluding VAT.*

***Chart 6.3.1***
***Forests of the Czech Republic, state enterprise – capital expenditures in 2001–2017 – watercourses***




*Source: Forests of the Czech Republic, s. e.*

***Chart 6.3.2***
***Forests of the Czech Republic, state enterprise – repair and maintenance of watercourses (total costs) in 2001–2017***




*Source: Forests of the Czech Republic, s. e.*

### *Measures in river basins*

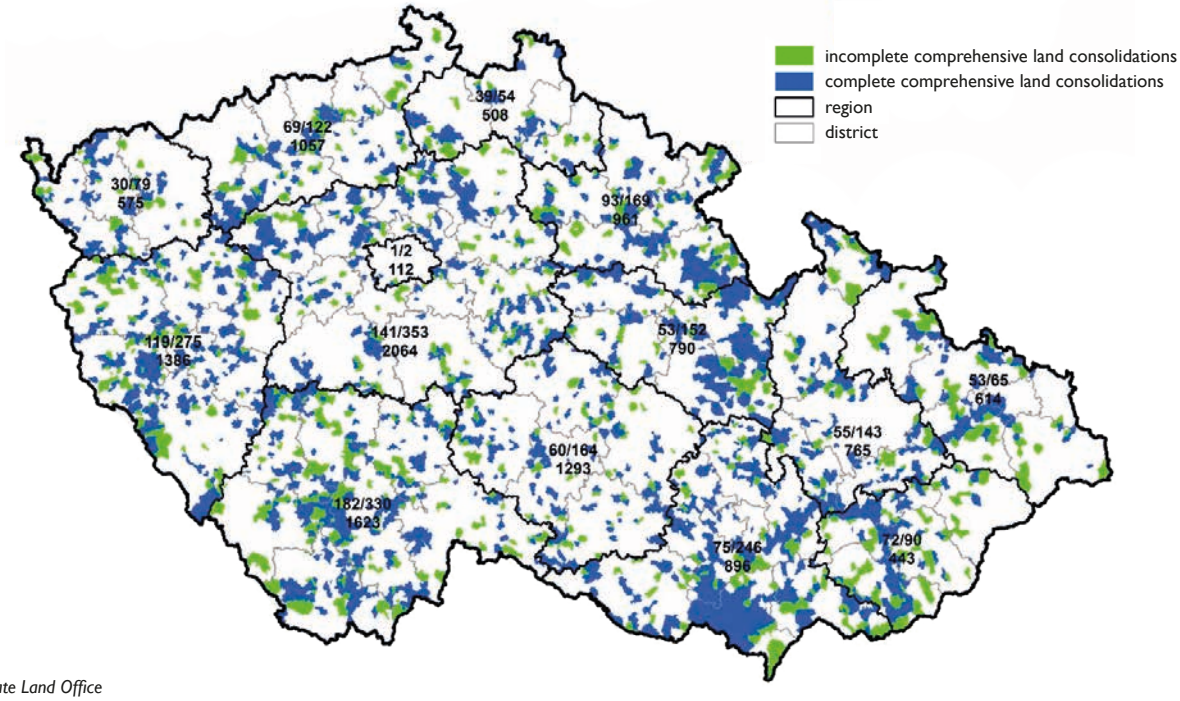
Low levels of waters in watercourses due to the drought of the previous years rose slightly in 2017. No significant floods were reported in 2017. In addition to implementing new flood measures, Forests of the Czech Republic, state enterprise, focused on maintenance of the property and, in particular, on water reservoir restoration. Forests of the Czech Republic also organized various educational events for the general public, especially for children. The general public is regularly informed about the activities of Forests of the Czech Republic.

## 6.4 Land consolidation, structures used for amelioration

### *Land consolidation*

In 2017, erosion control measures were built in the area of 51.39 ha and water management measures in 89.04 ha of the agricultural land resources. The State Land Office expended more than CZK 64 million on the implementation of erosion control measures and over CZK 210 million on the implementation of water management measures in 2017.

*Figure 6.4.1*
*Overview of comprehensive land consolidation measures by region as at 31/12 2017 (in 1991–2017)*




*Source: State Land Office*

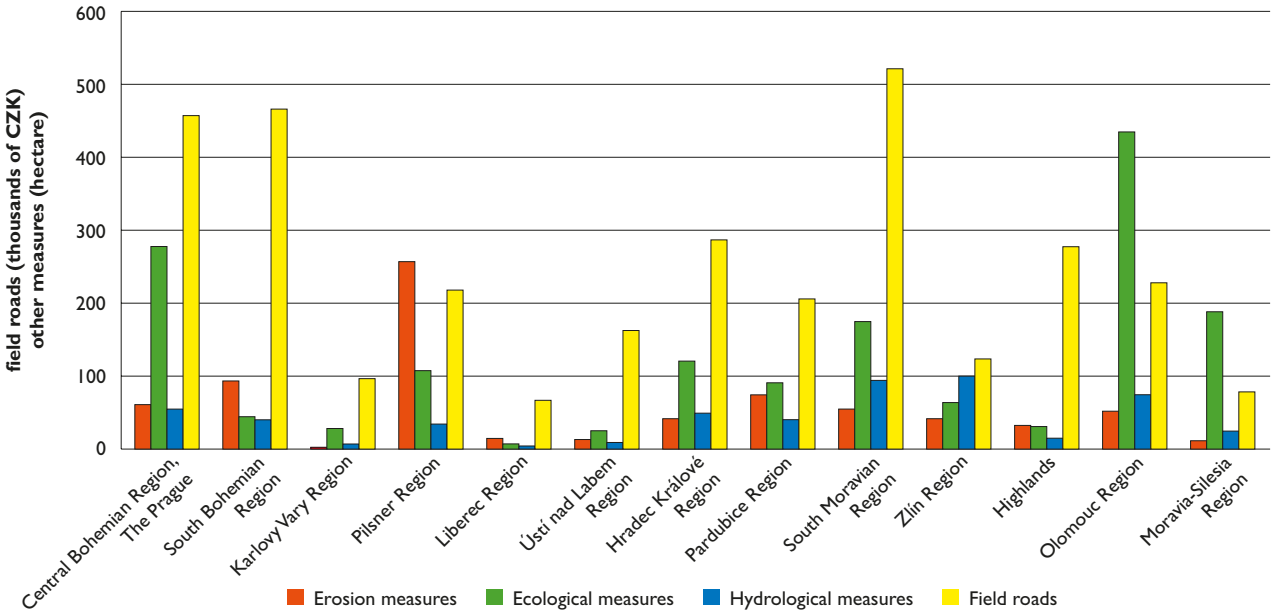
*Table 6.4.1*
*Use of funds of the State Land Office for land consolidation measures in 2017*

| Non-investment activities *) | | Implementation | | | | | | Non-investment activities and implementation in total |
|---|---|---|---|---|---|---|---|---|
| Total | Of which | Total | of which | | | | | |
| | land consolidation proposals | | roads | erosion control measures | water management measures | ecological measures | other | |
| thousands of CZK | | | | | | | | |
| **476 468** | 413 469 | **1 511 657** | 1 136 563 | 64 221 | 210 070 | 43 256 | 57 547 | **1 988 125** |

*Source: State Land Office*
*Note: *) Land consolidation, identification of plots pursuant to Act No. 229/1991 Coll.*

*By the Pond (source: Ohře River Board, s. e.)*

***Chart 6.4.1***
***State Land Office – Joint measures implemented under land consolidation as at 31 December 2017 (in 1991–2017)***




*Source: State Land Office*
*Note: Due to re-classification of erosion control measures in a branch of the State Land Office (Central Bohemia, Prague) there was a decrease in this indicator in comparison with 2016.*

### *Structures used for amelioration*

The State Land Office ensures the management, maintenance, repairs and operation of major drainage facilities, major irrigation facilities and erosion control measures owned by the state. In 2017, it administered property worth CZK 2.6 billion (in purchase price) consisting of 19,010 items. In 2017, it expended CZK 54.5 million on maintenance and administration of amelioration structures.

***Table 6.4.2***
***Water management property administered by the State Land Office in 2017***

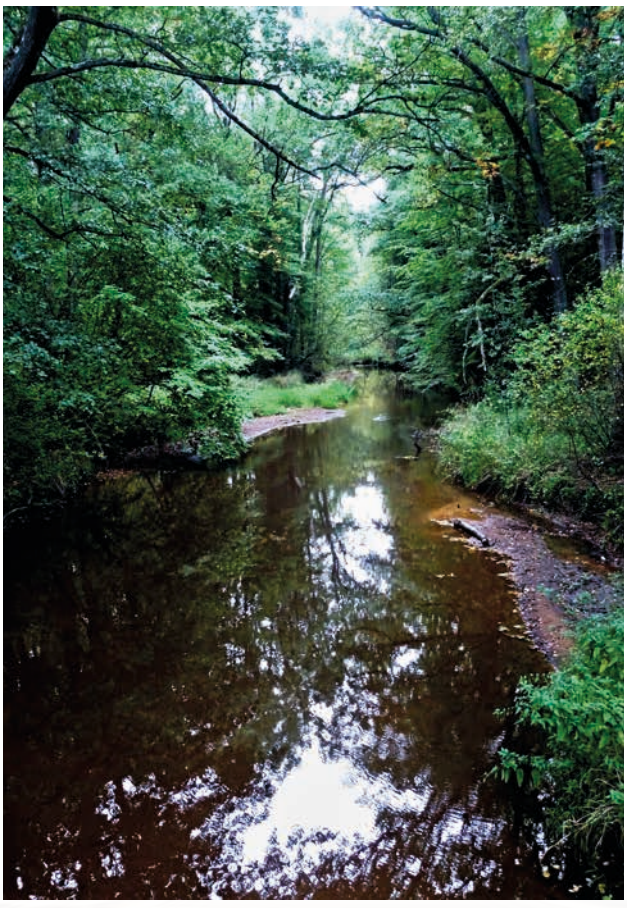
| Fixed assets | Purchase price in billions of CZK | of which | |
|---|---|---|---|
| 19 010 items | 2.581 | Channels<br>– open<br>– piped | 8,951.235 km<br>– 5,181.094 km<br>– 3,770.141 km |
| | | Water reservoirs | 22 pcs |
| | | Pumping stations | 130 pcs |

*Source: State Land Office*

***Table 6.4.3***
***Funds expended on maintenance and administration of amelioration structures in 2017***

| Costs | in millions of CZK (from the MoA budget) |
|---|---|
| Common maintenance and repairs | 41.0 |
| Operation of pumping stations | 13.5 *) |
| **Total** | **54.5** |

*Source: State Land Office*
*Note: *) The item includes electric energy consumption and repair costs.*

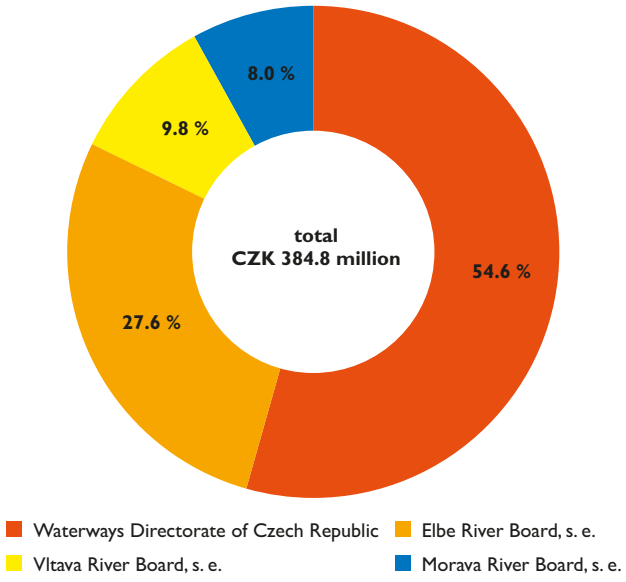


*In the Shadow of the Forest (source: Ohře River Board, s. e.)*

## 6.5 Waterways

Pursuant to Act No. 114/1995 Coll., on Inland Navigation, as amended, the management of the development and modernization of waterways of importance to shipping is in the competence of the Ministry of Transport. This activity concerns, in particular, the management of the development of the Elbe-Vltava waterway, which is the most important waterway system in the Czech Republic and is the only navigable connection between the Czech Republic and the West European waterway system. Almost CZK 390 million was expended on development, repairs, maintenance, reconstruction and modernization of waterways in 2017.

***Chart 6.5.1***
***Funds expended on significant waterways in 2017***




*Source: MoA using data provided by River Boards, s.e., and the Ministry of Transport*

*The Hněvkovice Lock Chamber (author: Petra Hubalová)*


*The Big Lock Chamber of the České Kopisty Dam (source: Elbe River Board, s. e.)*

*The Pastviny Dam (source: Elbe River Board, s. e.)*

# 7. PUBLIC WATER SUPPLY AND SEWERAGE SYSTEMS

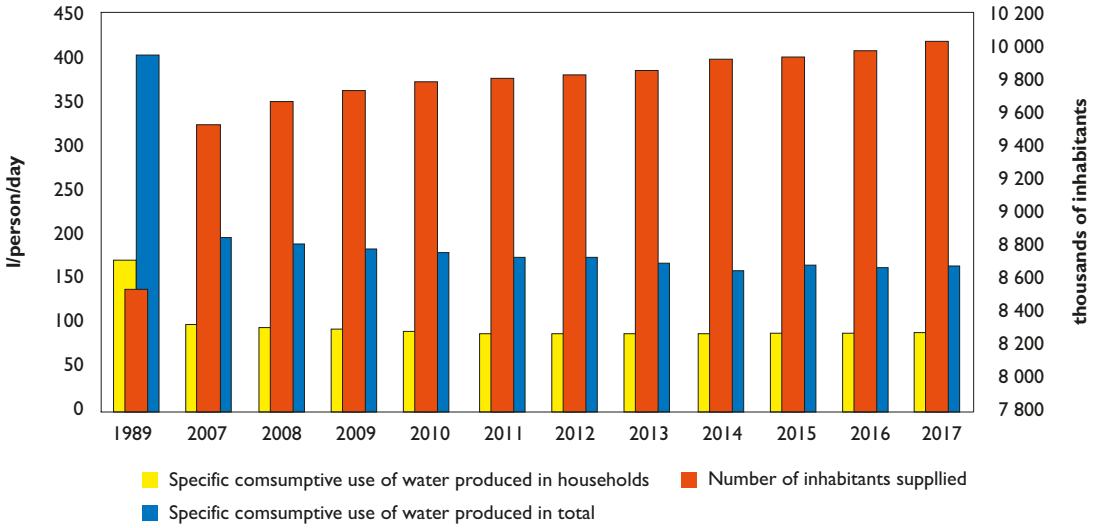
## 7.1 Drinking water supply

In 2017, water supply systems supplied water to 10.027 million inhabitants in the Czech Republic, i. e. 94.7% of the total population.

In 2017, the length of water supply network was extended by a total of 903 km and reached the length of 78,584 km. New construction of new water supply systems and completion of the existing ones thus resulted in 2017 in an increase in the number of inhabitants supplied by water by 54,893. The length of water supply network per one inhabitant supplied was 7.84 m.

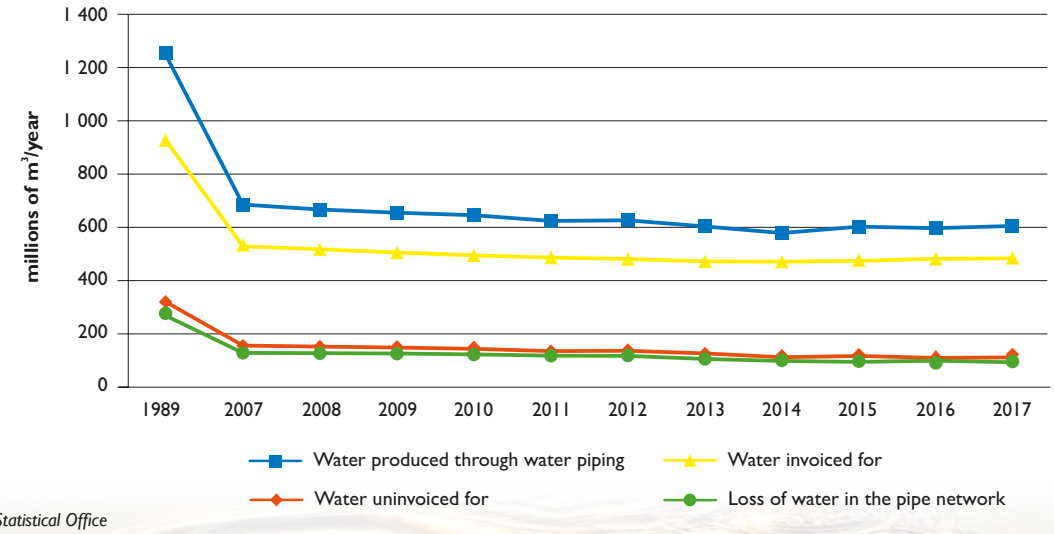
*The Hučivá Desná River, below the Water (author: Jiří Kvapil)*

***Chart 7.1.1***
***Development in the number of inhabitants supplied and the specific consumptive use of water invoiced in 1989 and 2007–2017***




*Source: Czech Statistical Office*

***Chart 7.1.2***
***Development in the quantity values of water produced in water supply systems and water invoiced in total in the years 1989 and 2007–2017***




*Source: Czech Statistical Office*

***Table 7.1.1***
***Water supply from water supply systems in 1989 and 2011–2017***

| Indicator | Measurement unit | Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1989 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Inhabitants (mean) | thousand inhabitants | 10 364 | 10 495 | 10 509 | 10 511 | 10 525 | 10 543 | 10 565 | 10 584 |
| Inhabitants actually supplied with water from water supply systems | thousand inhabitants | 8 537.0 | 9 805.4 | 9 823.1 | 9 854.4 | 9 917.2 | 9 929.7 | 9 972.5 | 10 027.4 |
| | % | 82.4 | 93.4 | 93.5 | 93.8 | 94.2 | 94.2 | 94.4 | 94.7 |
| Water produced by water supply systems | million $m^3$/year | 1 251.0 | 623.1 | 623.5 | 600.2 | 575.4 | 599.6 | 593.3 | 603.8 |
| | % as of 1989 | 100.0 | 49.8 | 49.8 | 48.0 | 46.0 | 47.9 | 47.4 | 48.3 |
| Water invoiced in total | million $m^3$/year | 929.4 | 486.0 | 480.7 | 471.8 | 468.7 | 476.8 | 478.9 | 482.0 |
| | % as of 1989 | 100.0 | 52.3 | 51.7 | 50.8 | 50.4 | 51.3 | 51.5 | 51.9 |
| Specific consumptive use of water produced | l/person/day | 401.0 | 174.0 | 173.8 | 166.8 | 158.9 | 165.4 | 162.5 | 164.9 |
| | % as of 1989 | 100.0 | 43.4 | 43.3 | 41.6 | 39.6 | 41.2 | 40.5 | 41.1 |
| Specific quantity of water invoiced in total | l/person/ day | 298.0 | 135.8 | 134.1 | 131.1 | 129.4 | 131.5 | 131.2 | 131.7 |
| | % as of 1989 | 100.0 | 45.6 | 45.0 | 44.0 | 43.4 | 44.1 | 44.0 | 44.2 |
| Specific quantity of water invoiced for households | l/person/ day | 171.0 | 88.6 | 88.1 | 87.1 | 87.3 | 87.9 | 88.3 | 88.7 |
| | % as of 1989 | 100.0 | 51.8 | 51.5 | 50.9 | 51.0 | 51.4 | 51.6 | 51.8 |
| Water losses per 1 km of water mains | l/km/day | 16 842.0*) | 4 220.0 | 4351.0 | 3 856.9 | 3 417.2 | 3 519.3 | 3 167.9 | 3 409.4 |
| Water losses per 1 inhabitant supplied | l/person/day | 90.0*) | 32.0 | 33.0 | 29.5 | 26.5 | 27.3 | 24.7 | 26.7 |

*Source: Czech Statistical Office*
*Note: *) Data for water supply systems run by the main operators.*

*Water Treatment Plant Káraný (author: Martin Mareš)*

## 7.2 Discharge and treatment of municipal waster waters

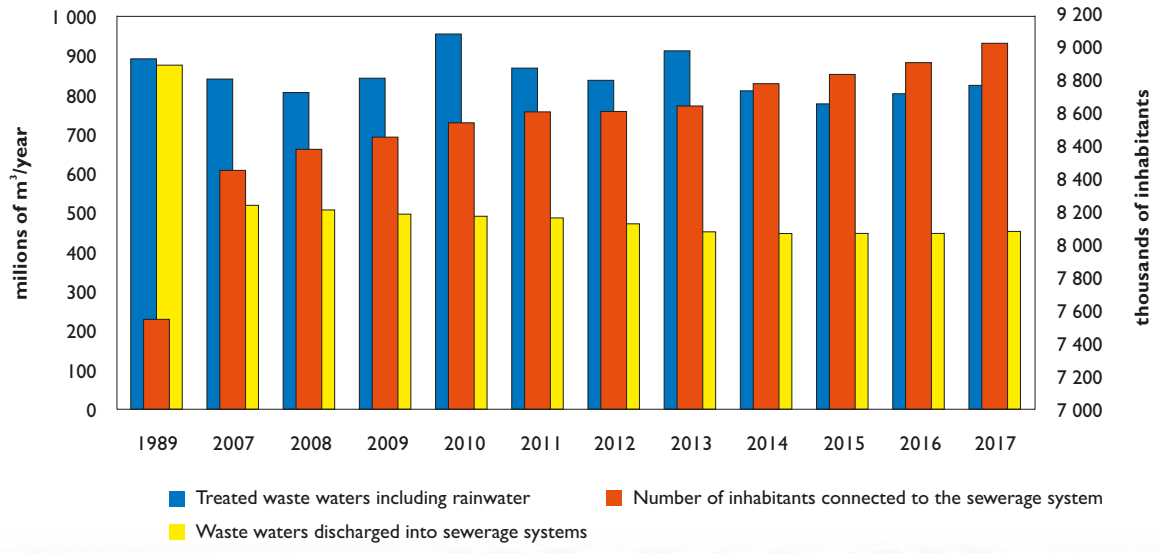
In 2017, a total of 9,052 million people in the Czech Republic lived in buildings connected to sewerage systems, i.e. 85.5 % of the total population. In total, 453.3 million m³ of waste waters (excluding rain water charged for) were discharged into sewerage systems. Out of this quantity, 97.5% of waste waters were treated (excluding rain water), which amounts to 442.2 million m³.

*Table 7.2.1*
*Discharge and treatment of waste waters from sewerage systems in 1989 and 2011–2017*

| Indicator | Measurement unit | Year | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1989 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| Inhabitants (mean) | thousands of inhabitants | 10 364 | 10 495 | 10 509 | 10 511 | 10 525 | 10 543 | 10 565 | 10 584 |
| Inhabitants living in buildings connected to sewerage systems | thousands of inhabitants | 7 501 | 8 672 | 8 674 | 8 705 | 8 828 | 8 882 | 8 944 | 9 052 |
| | % | 72.4 | 82.6 | 82.5 | 82.8 | 83.9 | 84.2 | 84.7 | 85.5 |
| Waste waters discharged to sewerage systems (excluding rain water charged for) in total | million m³ | 877.8 | 487.6 | 473.2 | 455.3 | 446.1 | 445.5 | 446.9 | 453.3 |
| | % as of 1989 | 100.0 | 55.5 | 53.9 | 51.9 | 50.8 | 50.8 | 50.9 | 51.6 |
| Treated waste waters including rain water [1)] | million m³ | 897.4 | 871.0 | 836.7 | 912.3 | 812.2 | 779.0 | 803.4 | 826.2 |
| Treated waste waters in total excluding rain water | million m³ | 627.6 | 472.2 | 459.4 | 443.4 | 432.3 | 432.0 | 434.9 | 442.2 |
| | % as of 1989 | 100.0 | 75.3 | 73.2 | 70.6 | 68.9 | 68.8 | 69.3 | 70.5 |
| Percentage of treated waste waters excluding rain water [2)] | % | 71.5 | 96.8 | 97.1 | 97.4 | 96.9 | 97.0 | 97.3 | 97.5 |

*Source: Czech Statistical Office*
*Note: [1)] In 1989, the data related to sewerage systems run by the main operators.*
*[2)] This percentage relates to waters discharged to sewerage systems (excluding rain water charged for).*

*Chart 7.2.1*
*Development in the number of inhabitants living in buildings connected to sewerage systems and the quantity of discharged and treated waste waters in 1989 and 2007–2017*




*Source: Czech Statistical Office*

## 7.3 Development of water and sewerage charges

Based on the survey carried out by the Czech Statistical Office, the average price of water charge excluding VAT amounted to 37.20 CZK/m³ and the average price of sewerage charge after refining the method of calculation amounted to 32.80 CZK/m³ in 2017.

*Table 7.3.1*
*Strike prices of water and sewerage charges in 2016 and 2017*

| Indicator | Measurement unit | 2016 | 2017 | Index 2017/2016 |
|---|---|---|---|---|
| Water rates in total | millions of CZK | 17 566 | 17 948 | 1.02 |
| Water invoiced in total | million m³/year | 478.9 | 482.0 | 1.01 |
| Average price of water rate | CZK/m³ excl. VAT | 36.7 | 37.2 | 1.01 |
| Sewerage charges in total | millions of CZK | 16 636 | 17 192 | 1.03 |
| Waste waters discharged to sewerage systems*) | million m³/year | 518.0 | 524.2 | 1.01 |
| Average price of sewerage rate | CZK/m³ excl. VAT | 32.1 | 32.8 | 1.02 |

*Source: Czech Statistical Office*
*Note: *) from 2013 including rain water charged for*

*Table 7.3.2*
*Water consumption, average prices of water and sewerage charges excluding VAT in 2017*

| Region | Specific quantity of water invoiced in total | Specific quantity of water invoiced to households | Average price of water rate | Average price of sewerage charge |
|---|---|---|---|---|
| | l/person/day | | CZK/m³ excl. VAT | |
| City of Prague | 173.3 | 109.3 | 40.6 | 33.8 |
| Central Bohemia | 121.6 | 85.3 | 40.2 | 32.5 |
| South Bohemia | 123.7 | 84.6 | 36.3 | 28.7 |
| Pilsen | 139.3 | 88.6 | 38.1 | 27.0 |
| Karlovy Vary | 134.7 | 85.5 | 36.9 | 34.3 |
| Ústí | 125.5 | 89.6 | 43.4 | 41.4 |
| Liberec | 124.2 | 86.8 | 42.7 | 42.2 |
| Hradec Králové | 122.3 | 80.2 | 34.6 | 33.2 |
| Pardubice | 120.8 | 78.0 | 32.9 | 35.1 |
| Vysočina | 120.1 | 79.1 | 36.3 | 27.6 |
| South Moravia | 134.8 | 92.9 | 33.6 | 33.5 |
| Olomouc | 119.4 | 83.5 | 32.5 | 31.3 |
| Zlín | 113.3 | 75.9 | 35.5 | 30.1 |
| Moravia-Silesia | 128.8 | 89.1 | 33.7 | 31.3 |
| **Czech Republic** | **131.7** | **88.7** | **37.2** | **32.8** |

*Source: Czech Statistical Office*

## 7.4 Regulation in water supply and sewerage systems

In connection with the amendment to the regulation in the water and sewerage system industry for public use in the Czech Republic in 2015 according to the Proposal of conceptual regulation in water industry approved by Government Resolution No. 86/2015 the Ministry of Agriculture and Committee for Coordinating Regulation in the Water Supply and Sewerage System Industry continued to carry on their activities.

*Table 7.4.1*
*Inspections performed at the owners and operators of water supply and sewerage systems in 2017*

| Entities inspected | Number of inspections |
|---|---|
| Water supply and sewerage system owners | 10 |
| – of which towns and municipalities | 9 |
| Water supply and sewerage system owners the are also operators | 23 |
| – of which towns and municipalities in the mode of independent operation | 14 |
| Water supply and sewerage system operators | 9 |
| – of which towns and municipalities in the mode of independent operation | 3 |
| **Total inspections** | **42** |

*Source: MoA*

*Marking of Pipeline in the field outside the urban area (author: Radek Hospodka)*

*Table 7.4.2*
*Overview of the most significant anomalies fond in the data analyzed for 2016*

| Anomaly | Share of the analyzed market (%) in total volume | |
|---|---|---|
| | water invoiced (447.10 mil. m³) | wastewaters (462.86 mil. m³) |
| **Benchmarking of the owners** | | |
| Insufficient creation of funds for infrastructural property restoration | 12.34 | 16.10 |
| Unreported values of creation and use of restoration funds | 13.84 | 15.14 |
| High number of failures per km of the distributing/sewerage system | 21.82 | 43.61 |
| **Benchmarking of the operators** | | |
| High ratio of profit/total costs | 20.35 | 24.36 |
| Negative calculated profit | 5.37 | 6.37 |
| High losses of drinking water per km calculated per the length of the water mains | 4.93 | - |
| Erroneous reporting about the number of people connected to waste water treatment plant | - | 9.09 |

*Source: MoA*
*Note: Significance is determined by the share of the water invoiced affected by the relevant anomaly.*

*Fish Harvest of the Vrkoč Pond, Pohořelice, October 2017 (author: Veronika Šimečková)*

# 8. FISHERIES AND FISHPOND MANAGEMENT

The term "fisheries" encompasses fishing, breeding, cultivation and protection of fish or any other organisms living in water. 21,685 tonnes of marketable fish was caught in the Czech Republic in 2017.

***Table 8.1.1***
***Market production of farmed fish in the Czech Republic***

| Species | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| | tonnes | | | | | | | | | |
| Carp | 17 507 | 17 258 | 17 746 | 18 198 | 17 972 | 16 809 | 17 833 | 17 860 | 18 354 | 18 460 |
| **Total** | **20 395** | **20 071** | **20 420** | **21 010** | **20 763** | **19 358** | **20 135** | **20 200** | **20 952** | **21 685** |

*Source: MoA and the Czech Fish Farmers Association*

***Table 8.1.2***
***Use of marketable fish produced by fish farming in the Czech Republic***

| Year | Total production | of which *) | | |
|---|---|---|---|---|
| | | sale of live fish in the Czech market | processed fish (live weight) | export of live fish |
| | thousands of tonnes | | | |
| 2008 | 20.4 | 8.4 | 1.7 | 9.0 |
| 2009 | 20.1 | 9.1 | 1.6 | 8.9 |
| 2010 | 20.4 | 9.5 | 1.8 | 9.1 |
| 2011 | 21.0 | 9.7 | 2.1 | 8.8 |
| 2012 | 20.8 | 9.5 | 2.3 | 8.6 |
| 2013 | 19.4 | 9.0 | 2.4 | 8.4 |
| 2014 | 20.1 | 8.5 | 2.1 | 8.4 |
| 2015 | 20.2 | 9.2 | 1.9 | 9.9 |
| 2016 | 21.0 | 8.3 | 2.5 | 11.0 |
| 2017 | 21.7 | 8.2 | 2.4 | 11.1 |

*Source: MoA and Czech Fish Farmers Association*

*The Fish Ladder, Hněvkovice (author: Martina Schmidová)*

***Table 8.1.3***
***Fish consumption in the Czech Republic***

| Species | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|---|---|
| | kg/person/year | | | | | | | | | |
| **Fish in total** | **5.9** | **6.2** | **5.6** | **5.4** | **5.7** | **5.3** | **5.4** | **5.5** | **5.1** | *) |
| of which freshwater fish produced and caught in the Czech Republic | 1.3 | 1.4 | 1.4 | 1.5 | 1.5 | 1.4 | 1.3 | 1.4 | 1.3 | 1.3 |

*Source: Czech Statistical Office and Czech Fish Farmers Association*
*Note: *) Data for 2017 are not available.*


*The České Vrbné Lock Chamber (author: Petra Hubalová)*

# 9. STATE FINANCIAL SUPPORT FOR WATER MANAGEMENT

## 9.1 State financial support

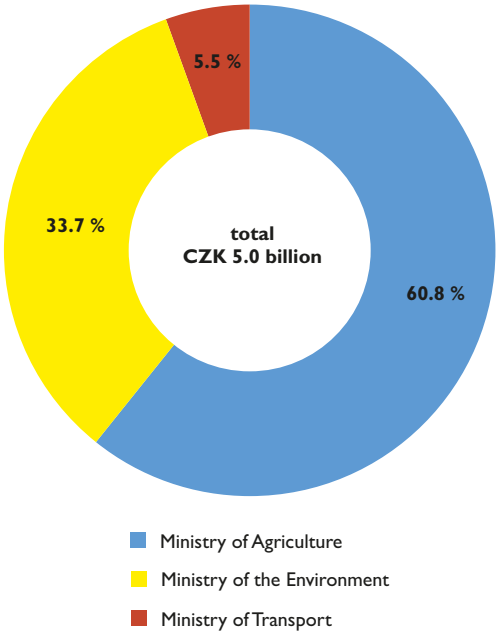
Financial support for water management includes selected national and transnational grant programmes linked with water management. In 2017, state financial support accounted for CZK 5.0 billion. The Ministry of Agriculture contributed to this amount with more than 61% (the funds provided amounted to almost CZK 3.1 billion), the Ministry of the Environment provided 33% (more than CZK 1.6 billion) and the Ministry of Transport with almost 6% (CZK 0.3 billion).

*Table 9.1.1*
*Major financial support in water management in 2017*

| Ministry | Total funds expended in millions of CZK |
|---|---|
| Ministry of Agriculture | 3 077.1 |
| Ministry of the Environment | 1 702.8 |
| Ministry of Transport | 280.0 |
| **Total** | **5 059.9** |

*Source: MoA using data prvided by the MoE and the State Fund for Transport Infrastructure*

*Chart 9.1.1*
*Financial support for water management by ministries in 2017*




*Source: MoA using data provided by MoE and the State Fund for Transport Infrastructure*

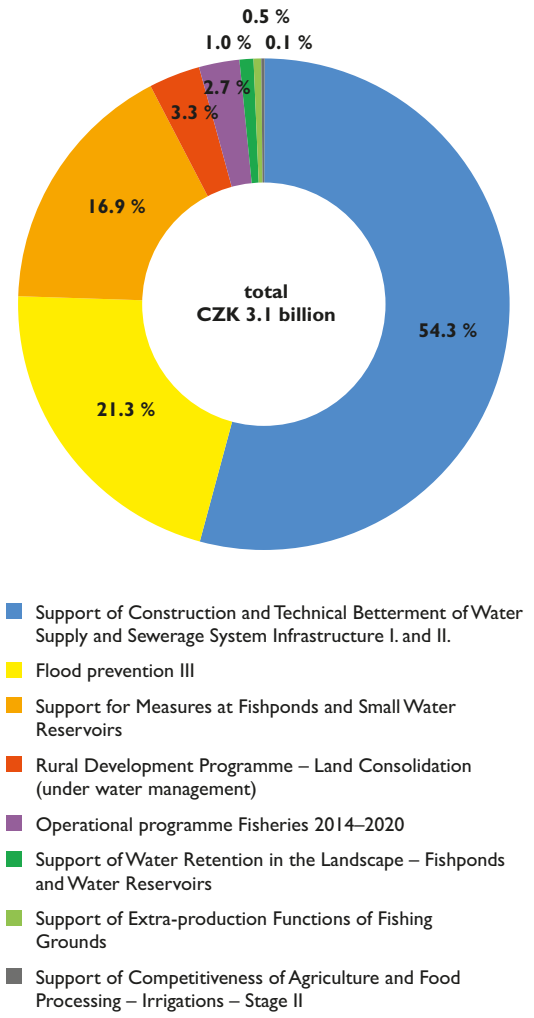
*The Naděje Dam (source: Ohře River Board, s. e.)*

### 9.1.1 Financial support provided by the Ministry of Agriculture

The Ministry of Agriculture administered eight grant programmes focused on water management in 2017. Six programmes were national and two were funded from national and transnational funds. The funds used amounted to a total of CZK 3.08 billion.

*Bat'a Canal – Vnorovy, Renovation of the bank protections, autumn 2017 (source: Morava River Board, s. e.)*

***Chart 9.1.1.1***
***Use of funds under programmes of the Ministry of Agriculture in 2017***




*Source: MoA*

***Table 9.1.1.1***
***State funds provided by the Ministry of Agriculture in 2017 under programme support***

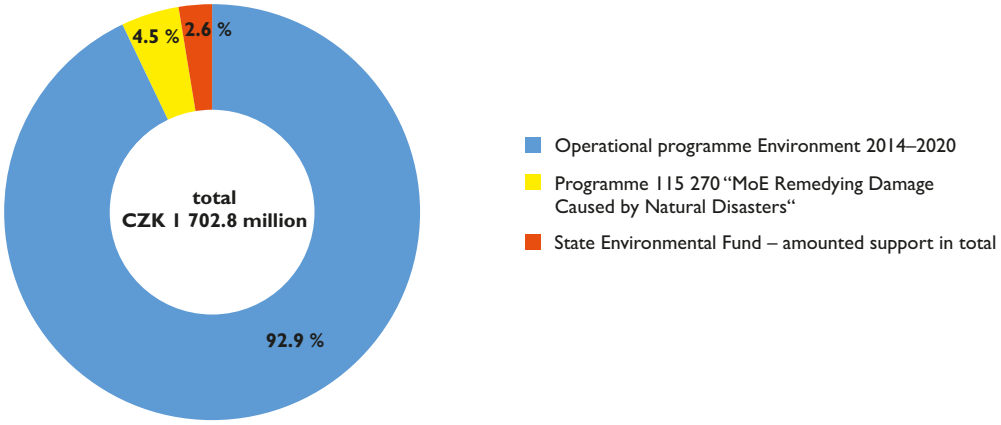
| Programme No. | Name of the programme | Programme expenditures in millions of CZK |
|---|---|---|
| 129 250 | Support of Construction and Technical Betterment of Water Supply and Sewerage System Infrastructure | 1 594.4 |
| 129 300 | Support of Construction and Technical Betterment of Water Supply and Sewerage System Infrastructure II | 74.9 |
| 129 260 | Flood prevention III | 655.3 |
| 129 290 | Support for Measures at Fishponds and Small Water Reservoirs | 518.9 |
| 129 280 | Support of Water Retention in the Landscape – Fishponds and Water Reservoirs | 30.9 |
| 129 310 | Support of Competitiveness of Agriculture and Food Processing – Irrigations – Stage II | 4.4 |
| 17 | Support of Extra-production Functions of Fishing Grounds | 15.0 |
| | Rural Development Programme – Land Consolidation (under water management) | 101.6 |
| | Operational programme Fisheries 2014–2020 | 81.7 |
| **Total** | | **3 077.1** |

*Source: MoA*

### 9.1.2 Financial support provided by the Ministry of the Environment

The Ministry of the Environment provided financial support under transnational and national grants in 2017.The funds for support in water management provided from the state budget totalled CZK 1,659.1 million in 2017, the funds from the budget of the State Environmental Fund amounted to CZK 43.7 million. In total, the Ministry of the Environment provided funds in water management amounting to CZK 1,702.8 million.

*Chart 9.1.2.1*
*Use of funds under programmes by the Ministry of the Environment in 2017*




*Source: MoE*

*Table 9.1.2.1*
*State financial support provided by the Ministry of the Environment in 2017*

| Name of the programme | Expenditure on programme financing in millions of CZK |
|---|---|
| Operational programme Environment 2014–2020 | 1 582.68 |
| Programme 115 270 "MoE Remedying Damage Caused by Natural Disasters" | 76.37 |
| **Ministry of the Environment – total** | **1 659.05** |
| Programme of Support for Municipalities Located in the Regions of National Parks | 0.65 |
| Programme No. 3.1.4 "Care for damp territories and water surfaces" | 1.30 |
| National programme Environment | 19.95 |
| Call No. 2/2016 PU in accordance with Directive of the MoE No. 8/2017 – loans from the State Environmental Fund | 21.81 |
| **State Environmental Fund – amounted support in total** | **43.71** |
| **Programmes of the Ministry of the Environment – amounted support in total** | **1 702.76** |

*Source: MoE, State Environmental Fund*

*The Kamenička Dam (source: Ohře River board, s. e.)*

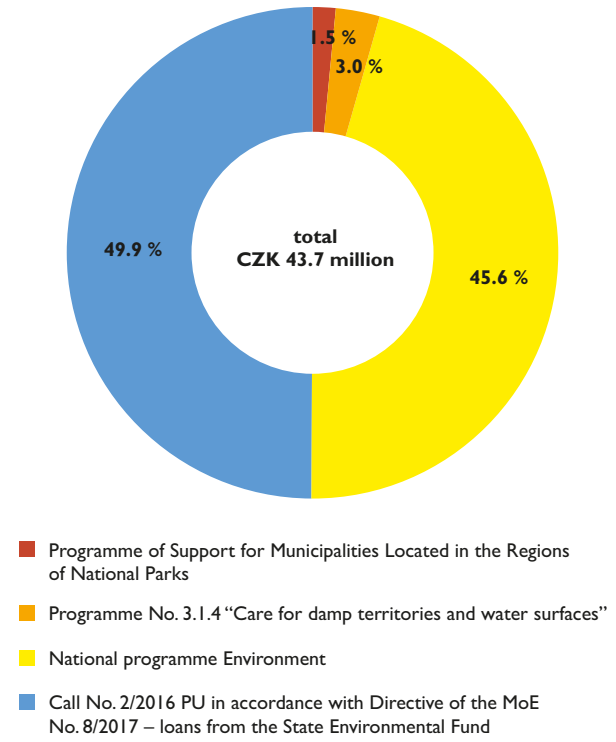
### *Operational Programme Environment 2014–2020*

The Ministry of the Environment provides financial support under programmes co-funded from the European Union grants through the Operational programme Environment. In 2017, funds from the Cohesion Fund and European Fund for Regional Development were used under priority axes 1 and 4 for the sphere of water management amounting to a total of CZK 1,582.7 million.

### *The State Environmental Fund of the Czech Republic*

The State Environmental Fund of the Czech Republic was established by Act No. 388/1991 Coll. It is a specifically oriented institution which is an important financial resource for support of implementation of measures to protect and improve the status of the environment in its respective components. On 31/12 2017, its budgeted revenues amounted to CZK 1,678.7 million.

***Graph 9.1.2.2***
***Use of funds under programmes by the State Environmental Fund of the Czech Republic in 2017***



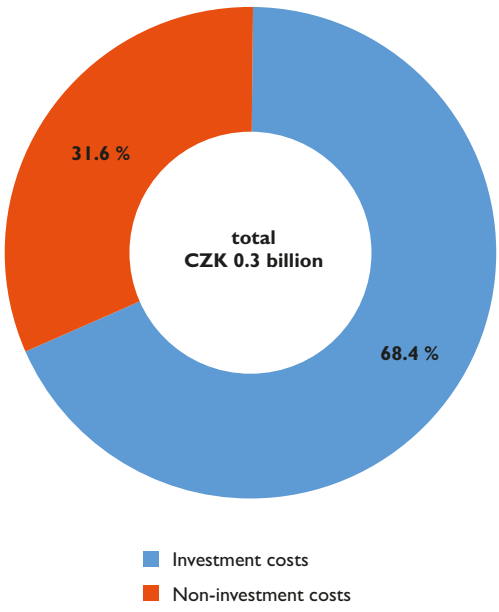

*Source: State Environmental Fund*

## 9.1.3 Ministry of Transport

### *State Fund for Transport Infrastructure*

The State Fund for Transport Infrastructure was established with Act No. 104/2000 Coll., n the State Transport Infrastructure Fund of 4 April 2000 with effect as of 1 July 2000. Representatives of the Ministry of Transport are members of the committee of the State Fund for Transport Infrastructure. The purpose of the fund is to fund building, modernization, repairs and maintenance of roads and motorways, national and regional railways and waterways with significance to transport in the extent defined by the above mentioned act. Almost CZK 280 million intended for the development, modernization and maintenance or waterways with significance to transport was paid from this fund in 2017. The national funds were expended through the Directorate of Waterways of the Czech Republic amounting to CZK 210 million – with investment costs totalling CZK 188.5 million and non-investment costs totalling to CZK 21.5 million – and through River Boards, state enterprises, amounting to almost CZK 70 million.

***Graph 9.1.3.1***
***Use of funds from the State Fund for Transport Infrastructure of the Ministry of Transport in 2017***




*Source: Ministry of Transport*

*The Naděje Dam – Renovation of Safety Spillway Crest (source: Ohře River Board, s. e.)*

*The Naděje Dam – Renovation of Safety Spillway Crest (source: Ohře River Board, s. e.)*

*Table 9.1.3.1*
***State funds provided by the State Fund for Transport Infrastructure in 2017***

| Item | millions of CZK |
|---|---|
| Investment costs | 190.0 |
| Non-investment costs | 87.6 |
| **Total** | **277.6** |

*Source: State Fund for Transport Infrastructure*

*Upper roadstead, the Střekov Dam (source: Elbe River Board, s. e.)*

*Table 9.1.3.2*
***Financial funds expended by River Boards, state enterprises, on repair, maintenance, building, reconstruction and modernization and waterways administered in 2017***

| River Board, s. e. | Own sources | Operational grants *) | Investment grants | | | Grants in total | Own sources and grants in total |
|---|---|---|---|---|---|---|---|
| | | | total | of which | | | |
| | thousands of CZK | | | | provider | thousands of CZK | |
| **Elbe** | 80 394 | 26 000 | 0 | 0 | | **26 000** | **106 394** |
| **Vltava** | 19 890 | 17 642 | 0 | 0 | | **17 642** | **37 532** |
| **Morava** | 4 979 | 22 445 | 3 463 | 1 515<br>684<br>1 264 | State Fund for Transport Infrastructure<br>Zlín Region<br>South Moravia Region | **25 908** | **30 887** |
| **Total** | **105 263** | **66 087** | **3 463** | **3 463** | | **69 550** | **174 813** |

*Source: River Boards, s.e.*
*Note: *) Grant provider – the State Fund for Transport Infrastructure.*

## 9.2 Financial support from international cooperation and the EU

The Centre for Regional Development of the Czech Republic is a state-funded institution established by Act No. 248/2000 Coll., on the Support of Regional Development, managed by the Ministry of Regional Development of the Czech Republic.

The main mission of the organization is to support regional policy of the government implemented using European funds. It has been entrusted with administering the Integrated Regional Operational Programme and transnational, national and inter-regional cooperation programmes in 2014–2020. Nine projects in the sphere of water management were funded in 2017. The expenses approved under these projects totalled to EUR 103,186.5.


*The Pond Velký rybník – restoration of bottom drains (source: Elbe River Board, s. e.)*

*Drainage Chanel, The Josefův Důl Dam (source: Elbe River Board, s. e.)*

# 10. LEGISLATIVE MEASURES

## 10.1 Water Act and implementing regulations

The Water Act was not directly amended in 2017. The Water Act was indirectly amended in the following two cases:

By Act No. 183/2017 Coll., amending some acts in relation with the acceptance of the act on liability for offences and offence proceedings and the act on some offences.

By Act No. 225/2017 Coll., amending Act No. 183/2006 Coll., on Land-use Planning and building code (the Building Act), as amended, and by other relevant acts.

## 10.2 Act on Public Water Supply and Sewerage Systems and implementing regulations

In 2017, there was no direct amendment to the Act on Public Water Supply and Sewerage Systems). It was indirectly amended in the following three cases:

Act No. 183/2017 Coll., amending some acts in relation with the acceptance of the act on liability for offences and offence proceedings and the act on some offences.

By Act No. 193/2017 Coll., amending Act No. 256/2001 Coll., on Funeral Services and on amendments to some acts, as amended, and other relative acts.

By Regulation No. 448/2017 Coll., amending Regulation No. 428/2001 Coll., implementing the Act on Public Water Supply and Sewerage Systems

## 10.3 Audits of the execution of public administration in the field of water management

### *Ministry of Agriculture*

Auditing of the execution of the delegated powers in water management sector is carried out within the organizational structure of the Ministry of Agriculture by the Department for State Administration in the Water Management Sector and for River Basin Administration as the central water authority. In 2017, audits of the execution of delegated powers were performed at five regional authorities and 18 municipal authorities with extended powers performing the function of the water authority.

### *Ministry of the Environment*

Supervision of the execution of the delegated powers in water management is annually carried out within the supreme water management supervision by the Ministry of the Environment as the central water authority through the Departments for Execution of State Administration. The ministry performed a total of 11 audits in 2017, of which four at regional authorities, six at water authorities by municipal authorities with extended powers and one at the Czech Environmental Inspection.

*Biomas Cleaning Out of the Bat'a Canal with Working Boat Jožin (source: Morava River Board, s. e.)*

*Bat'a canal (author: Martina Schmidová)*

# 11. PRIORITY TASKS, PROGRAMMES AND KEY DOCUMENTS IN WATER MANAGEMENT

## 11.1 Planning in the field of waters

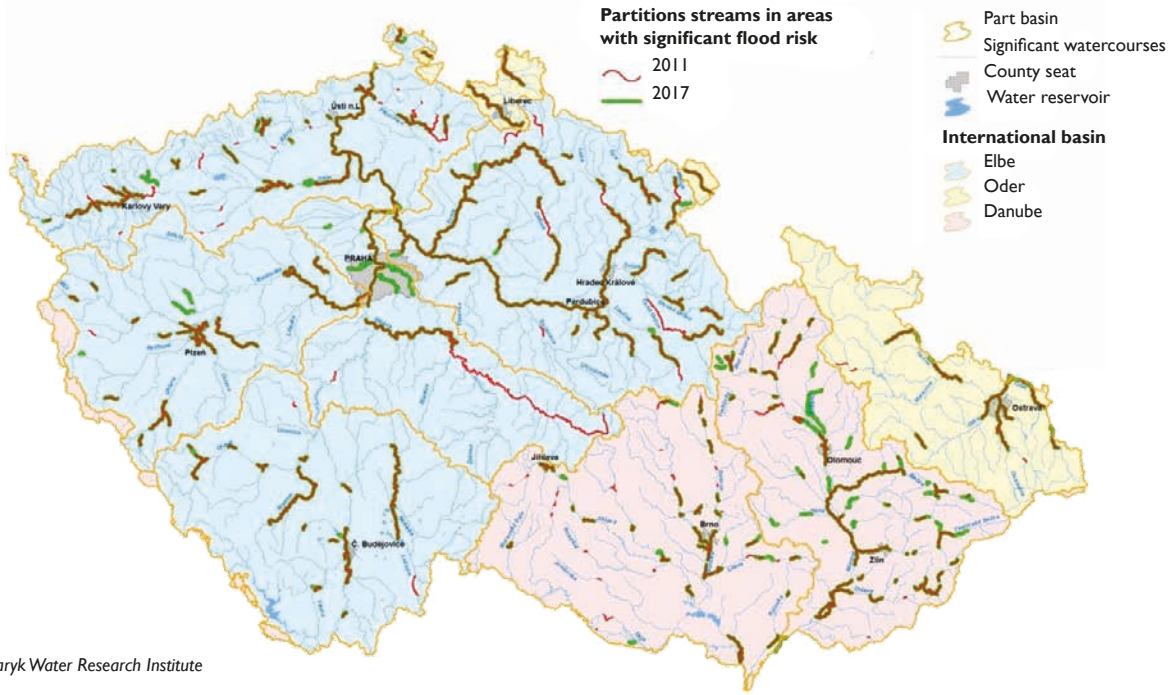
In 2017, measures resulting from plans for River Boards continued to be implemented and the third stage of planning for 2021–2027 were initiated: the plans are focused on review and update of the current plans for River Boards. At the same time, measures resulting from approved plans for coping with flood risks continued to be implemented. While making plans for coping with flood risks, a proposal to define areas with significant flood risks was elaborated.

### *Plans for coping with flood risks*

In 2017, the Methods of preliminary flood risk assessment in the Czech Republic were completed and updated and the analysis leading to the update of preliminary flood risk assessment was completed. In November, the proposal of the update of preliminary flood risk assessment was published so that it can be objected by the general public.

*The Tunnel in the Levee of the Pastviny Dam (source: Elbe River Board, s. e.)*

***Figure 11.1.1***
***Comparison of areas with significant flood risk between first and second plan cycle in accordance with the Flood Directive***




*Source: T. G. Masaryk Water Research Institute*

## 11.2 Development plans for water supply and sewerage systems

The National Development Plan for Water Supply and Sewerage Systems in the Czech Republic, prepared pursuant to Section 29, Subsection 1, Letter b) of Act No. 274/2001 Coll., on public water supply and sewerage systems and on amendments to certain related laws, as amended, is placed on the website of the Ministry of Agriculture.

In 2017, 951 statements were issued. In total for the period of 2006–2017, the Ministry of Agriculture issued 6,207 statements, which accounts for approximately 36% of municipalities and local districts of towns in the Czech Republic out of a total of 17,166 under the National Development Plan for Water Supply and Sewerage Systems in the Czech Republic and under the Regional Development Plan for Water Supply and Sewerage Systems of the Czech Republic.

*Bat'a canal – the Weir on the Velička River, Strážnice (author: Luboš Vřešťál)*

## 11.3 Programmes and measures aimed at reducing surface water pollution

### *Construction projects for water quality protection completed in 2017*

In 2017, three new municipal waste water treatment plants were built and 17 plants were reconstructed for sources of pollution with the population of more than 2,000 population equivalent (13 municipal and four industrial ones).

### *Action Programme under Directive of the Council 91/676/EEC (Nitrates Directive)*

In 1991, Council Directive 91/676/EEC on the protection of waters against pollution caused by nitrates from agricultural sources, the Nitrates Directive, was adopted. In autumn 2017, a proposal of the government decree amendment was submitted: its main objective was the technical adjustment concerning accuracy improvement of conditions and removing formal imperfections that manifested in the agricultural application practice.

In October 2017, the European commission informed the Czech Republic that it accepted the interpretation of the pilot procedure EU Pilot No. 4549/13/ENVI concerning implementation of Council Directive 91/676/EEC of 12 December 1991 on the protection of waters against pollution caused by nitrates from agricultural sources (the Nitrates Directive). The Czech Republic held the pilot procedure with representative of the European Union from 2012.

## 11.4 Accompanying strategic documents

### *Strategy of the Ministry of Agriculture of the Czech Republic with the outlook until 2030*

It is a fundamental strategic document of the Ministry of Agriculture that was approved by Government Resolution No. 392 of 2 May 2016. In order to ensure transparent and effective management of its strategy, the Government subsequently approved the Implementation Plan of the Strategy of the Ministry of Agriculture for 2017–2020 by Government Resolution No. 838 of 29 November 2017.

### *Analysis of threats for the Czech Republic*

In 2017, situational plans for critical plans were elaborated in accordance with the tasks assigned by the Analysis of threats for the Czech Republic and updated Methodological Instruction on Elaborating Situational Plans. From the perspective of water management, the following situational plans are crucial: Flood, Torrential flood, Heavy rainfall, Long-term drought, special flood and Large-scale failure of drinkable water supply.

## 11.5 Information system WATER of the Czech Republic

In 2017, the deputy minister for water management issued an order to maintain central records of watercourses, records of water reservoirs, records of constructions at watercourses and records of water structures used for land improvement. It is particularly the central records of watercourses that undergo a fundamental change, which is due to introducing "section model" in the information systems of River Boards, state enterprises, and Forests of the Czech Republic and due to preparation of an application for online communication between entities administering data about the river network.

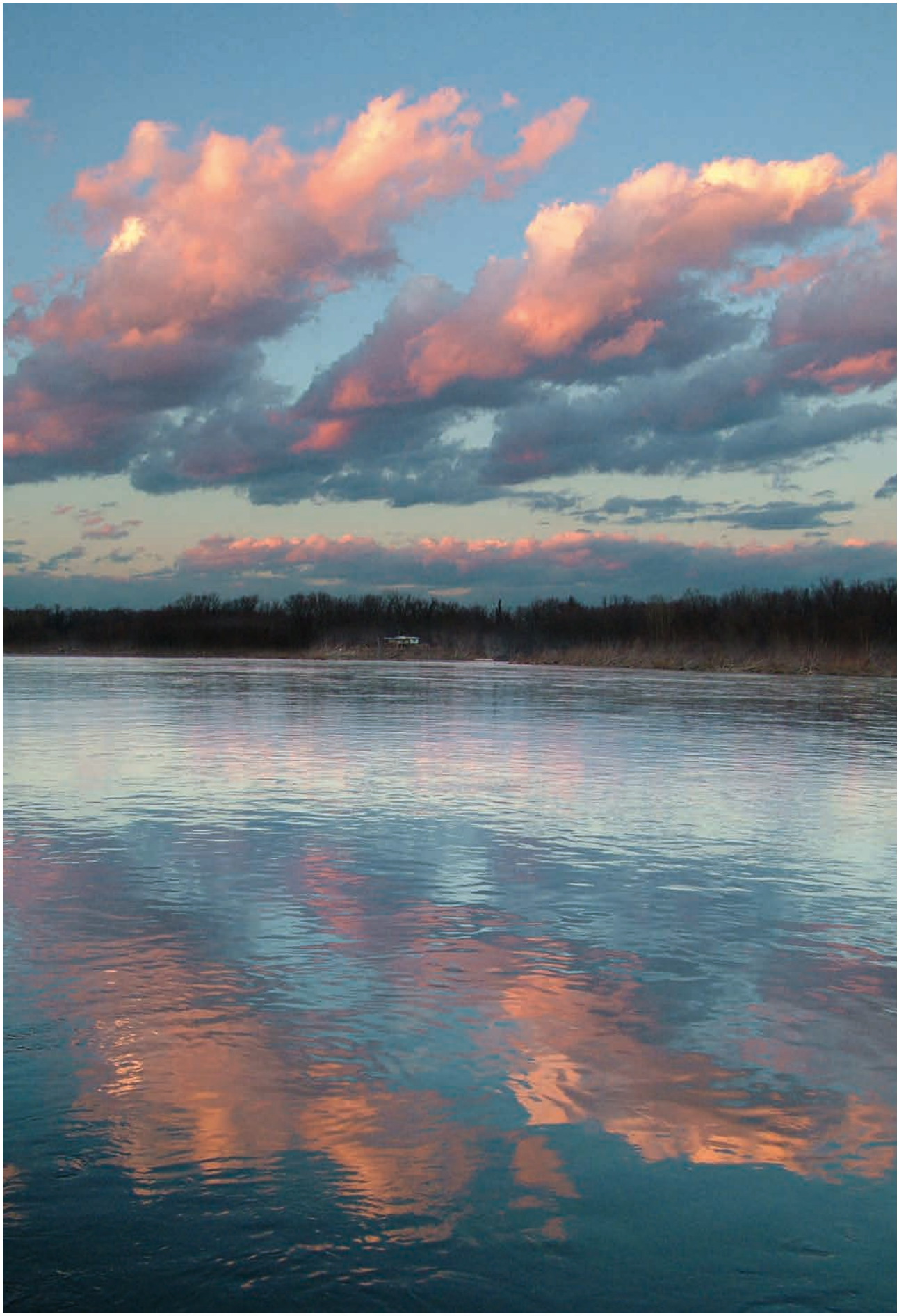
## 11.6 Czech Republic's reporting to the EU

From the perspective of European legislation, waters designated for bathing are governed by Directive of the European Parliament and of the Council 2006/7/EC of 15 February 2006 on the management of bathing water quality and repealing Directive 76/160/EEC.

In 2017 bathing season a ban on bathing was issued for 11 locations, of which at three locations due to microbial pollution. From 150 reported waters for bathing only one location was classified as unsuitable (the Staňkovský Pond).

*The Fláje Dam (source: Ohře River Board, s. e.)*

*The Pastviny Dam (source: Elbe River Board, s. e.)*



*(source: Shutterstock, author: LornaGraphics)*

# 12. INTERNATIONAL RELATIONS

International cooperation of the Czech Republic in the sphere of water protection is based on the principles arising from the UN/ECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes, which the Czech Republic is a party to.

## 12.1 Cooperation within the UN/ECE

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) is intended to strengthen national measures for the protection and ecologically sound management of transboundary surface waters and groundwaters. The Convention obliges the Parties to prevent, control and reduce transboundary impact, use transboundary waters in a reasonable and balanced way and ensure their sustainable management.

*Excursion to the Brown Coal Mine Turöw (source: Czech Geological Survey)*

## 12.2 International cooperation of the Czech Republic in the integrated Elbe, Danube and Oder River Basins

Modern water protection principles, based on the hydrological basins of large transboundary rivers, started to be applied in the Czech Republic in 1990. International cooperation takes place on the basis of the following agreements:

Agreement on the International Commission for Protection of the Elbe

Convention on Cooperation for Protection and Sustainable Use of the Danube River

Agreement on the International Commission for Protection of the Oder River against Pollution

## 12.3 International cooperation of the Czech Republic on transboundary waters

The total length of the state border of the Czech Republic with neighbouring states is 2,290 km, of which approximately a third is known as the "wet line", which means that 740 km of the state border are constituted by watercourses and water surfaces. Under international cooperation in transboundary waters the Czech Republic has international agreements with all neighbouring countries that are performed through relevant committees for transboundary waters.


*Workshop, Liquidation of fire-prevention waters (source: International Commission for the Protection of the Oder River against Pollution)*

*(source: Shutterstock, author: AnastasiaAnna)*

# 13. RESEARCH AND DEVELOPMENT CONCERNING WATERS

In 2017, the Ministry of Agriculture provided special-purpose and institutional funding to address research and development projects and long-term conceptual development of research organizations in the field of water management in the amount of CZK 35.3 million.

The Ministry of the Environment encompasses two research organizations in water management: T. G. Masaryk Water Research Institute, public research institution, and the Czech Hydrometeorological Institute. The Ministry of the Environment is not a provider of special-purpose grants, which is why it uses the possibility to fund certain spheres in need of support under existing financial programmes. Nevertheless, it provides institutional support that amounted to CZK 19.9 million in 2017.

*Confluence of the Rivers Elbe and Orlice at Hradec Králové (source: Elbe River Board, s. e.)*

# Interesting numbers from 2017

- Basic hydrological network: 99.198 thousand km of watercourses
- Purchase value of fixed assets related to watercourses: CZK 52.56 billion (year-on-year increase by CZK 0.4 billion)
- Income of River Boards, state enterprises, increased by CZK 559 million (mainly due to an increase in electric power generation, charges for surface water abstractions and other revenues)
- Average price for 1 $m^3$ of surface water – CZK 4.90 (year-on-year increase by 5.5%)
- Investments of River Boards, s. e.: CZK 1.895 billion, of which CZK 1.08 billion (57%) of internal funds
- Land consolidation: CZK 1.988 billion, of which CZK 210 million for water management measures and CZK 64 million for anti-erosion measures
- Population supplied with drinkable water: 10.027 million (94.7%) – most in Prague and the Karlovy Vary Region (100%) and Moravia-Silesia Region (99.9%), least in the Pilsen Region (85%) and in the Central Bohemian Region (86.4%)
- Water consumption (invoiced to households): 88.7 l/person/day (year-on-year increase by 0.4 l/person/day)
- Population connected to sewerage system: 9.052 million (85.5%) – most in the Karlovy Vary Region (99.3%) and Prague (99.2%), least in the Central Bohemian Region (73.4%) and the Liberec Region (69%)
- 1,702 million $m^3$ of waste waters and mine waters discharged into watercourses (year-on-year increase by 0.1%)
- Total length of the water supply system: 78,584 km (extended by 903 km)
- Total length of the sewerage system: 48,491 km (extended by 1,350 km)
- Number of waste water treatment plants: 2,612 (increased by 58)
- Water rate: average price: CZK 37.20 per $m^3$, highest in the Ústí nad Labem Region (CZK 43.40 per $m^3$), lowest in the Olomouc Region (CZK 32.50 per $m^3$)
- Sewerage charge: average price: CZK 32.80 per $m^3$, highest in the Liberec Region (CZK 42.20 per $m^3$), lowest in the Pilsen Region (CZK 27.00 per $m^3$)
- Production of marketable fish: 21,685 tonnes (20,767 tonnes from ponds)
- State financial support in water management – CZK 5.0 billion
  - Programmes of the Ministry of Agriculture – CZK 3.1 billion:
    - public water supply and sewerage systems:
      - 81 projects focused on water supply systems (CZK 445 million),
      - 143 projects focused on sewerage systems (CZK 1,224 million),
      - subsidised loans: subsidies for interests (89 loans amounting to CZK 14 million)
    - flood measures – 61 projects (CZK 655 million)
    - administration of minor water courses and small water reservoirs owned by the state – 480 projects (CZK 519 million)
    - support for water retention in the landscape – 12 projects (CZK 31 million)
    - irrigation – 6 projects (CZK 4 million)
    - support for extra-production functions of fishing grounds – 40 projects (CZK 15 million)
    - Operational Programme Fisheries 2014–2020: 80 projects (CZK 82 million)
    - Rural Development Programme (land consolidation in water management) – CZK 102 million
  - Programmes of the Ministry of the Environment – CZK 1.7 billion:
    - Funds used from the state budge (MoE):
      - Operational programme "Environment 2014–2020" (water management) – CZK 1,583 million
      - National programme – CZK 76 million
    - Support from the State Environmental Fund – national programs – CZK 44 million
  - State Fund for Transport Infrastructure – CZK 0.3 billion
- Research and development in water management:
  - Ministry of Agriculture – CZK 35.3 million
  - Ministry of the Environment – CZK 19.9 million

# List of acronyms in text

| | |
|---|---|
| $BOD_5$ | biochemical five-day oxygen demand |
| $COD_{Cr}$ | chemical oxygen demand |
| CSN | Czech State Standard |
| DIS | dissolved inorganic salts |
| EC | European Commission |
| EU | European Union |
| MoA | Ministry of Agriculture |
| MoE | Ministry of the Environment |
| $N_{inorg}$ | inorganic nitrogen |
| NACE | Nomenclature statistique des activités économiques dans la Communauté européenne (sectoral classification of economic activities according to Eurostat) |
| NM | non-dissolved matters |
| $P_{total}$ | total phosphorus |
| s. e. | state enterprise |
| VAT | value added tax |

*The Riprap Treating, Litoměřice (source: Elbe River Board, s. e.)*

*The Pond under the windows – Vitíněves, the Pond by the Landštejn Reservoir (author: Jana Wagnerová)*

*The Huber-Lutz Weir (author: Petra Hubalová)*

# Important contacts in water management

| |
|---|
| **Ministry of Agriculture of the Czech Republic** |
| Těšnov 65/17, Prague 1, 110 00, www.eagri.cz |
| **Ministry of the Environment of the Czech Republic** |
| Vršovická 1442/65, Prague 10, 100 10, www.mzp.cz |
| **Elbe River Board, state enterprise** |
| Víta Nejedlého 951/8, Hradec Králové, 500 03, www.pla.cz |
| **Vltava River Board, state enterprise** |
| Holečkova 3178/8, Prague 5 – Smíchov, 150 00, www.pvl.cz |
| **Ohře River Board, state enterprise** |
| Bezručova 4219, Chomutov, 430 03, www.poh.cz |
| **Oder River Board, state enterprise** |
| Varenská 3101/49, Ostrava, Moravská Ostrava, 701 26, www.pod.cz |
| **Morava River Board, s. e.** |
| Dřevařská 932/11, Brno, 601 75, www.pmo.cz |
| **Forests of the Czech Republic, s. e.** |
| Přemyslova 1106/19, Hradec Králové, 501 68, www.lesycr.cz |
| **Czech Hydrometeorological Institute** |
| Na Šabatce 2050/17, Prague 412 – Komořany, 143 06, www.chmi.cz |
| **T. G. Masaryk Water Management Research Institute, public research institution** |
| Podbabská 2582/30, Prague 6, 160 00, www.vuv.cz |
| **State Land Office** |
| Husinecká 1042/11a, Prague 3 – Žižkov, 130 00, www.spucr.cz |
| **Research Institute for Amelioration and Soil Protection, public research institution** |
| Žabovřeská 250, Prague 5 – Zbraslav, 156 27, www.vumop.cz |

*The Ploučnice River (source: Ohře River Board, s. e.)*

*The Winter Morning over the Janov Dam (source: Ohře River Board, s. e.)*

**Report on Water Management in the Czech Republic in 2017**
As of 31 December 2017

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Ministry of Agriculture of the Czech Republic

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Ministry of the Environment of the Czech Republic

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