# Report on Water Management in the Czech Republic

As at 31 December 2011

#### Dear Readers,

This year again the Ministry of Agriculture and the Ministry of the Environment first submitted to the Government of the Czech Republic and now they are presenting to the public the "Report on Water Management of the Czech Republic in 2011". It is already the 15th summary balance of this kind, which most of you know under a familiar name "Blue Report". You will find the basic information on water and waters in the Czech Republic in the past year 2011, the management of water and the efforts to use it effectively, the water management system in our country and cooperation with neighbouring countries, as well as on water quality and trends which can be found from comparison of the parameters of the previous years. The Blue Report also provides an overview of the cooperation between the two ministries which share the responsibilities in the field of water management. And I am glad that I can call this cooperation sound and hopefully developing towards the future.

The Ministry of Agriculture of the Czech Republic as the central water authority executes its authority in water management through watercourse administrators, i.e. the five River Boards, state enterprises, and the Forests of the Czech



Republic, state enterprise. The year 2011 was the first year when the watercourses were administered by the six above mentioned state-owned enterprises without the contribution of the Agricultural Water Management Administration which, in accordance with the planned transformation, operated as a "residual" organizational unit of the state, which was responsible solely for the management of the main drainage facilities. The year 2011 was, therefore, a year of the largest transfer of administration of minor watercourses in a total length of more than 46 thousand km. I am pleased to say that this took place without any major problems, for which I would like to thank everyone who in the dedication and commitment participated in this action.

In the spring 2011, increased water levels of some watercourses occurred several times, however, they did not necessitate to cope with the flood situations as it was in recent years unfortunately all too often. Nonetheless, the efforts at building additional flood control measures continued, because we know that another flood may come at any time. It is our duty to protect human lives and property and to use for this purpose all the skills and resources that are available to us. I would like to say that despite the unavoidable austerity measures that affected various spheres of our lives, the necessary funds were expended in 2011 on the remediation of flood damage from 2009 and 2010 and on flood prevention for years to come.

It is obvious to everyone today, that this prevention is to be built in harmony of the so-called technical and the so-called nature-friendly flood control measures and thus in close cooperation of the Ministry of Agriculture with the Ministry of the Environment. I can say that this cooperation is successful and demonstrates the potential for further mutual approximation and improvements.

I believe and hope that the "Blue Report" will bring all those interested in water management enough information and help them gain insight into the diversity and volume of activities that were in 2011 associated with water management in the Czech Republic.

Petr Bendl Minister of Agriculture of the Czech Republic

#### Dear Readers,

We present a publication called the Report on Water Management of the Czech Republic in 2011 known rather to the general public as the Blue Report. This report provides a comprehensive overview of the status of water protection and water management in the Czech Republic.

Water as a fundamental component of the environment and at the same time the basic need of human society is in terms of competence split between the Ministry of the Environment of the Czech Republic and the Ministry of Agriculture of the Czech Republic. The basis of being successful in this field is a close and constructive cooperation of the two sectors which is also proved by this jointly prepared report. Without the good cooperation of our sectors it would not be possible to carry out planning in the field of waters, effective flood control and national agricultural policy with minimum adverse impact on the indiviual components of the environment or implement joint geo-environmental measures.

One of the most important financial tools for protection and improvement of the environment is the Operational Programme Environment which offers in the years 2007–2013 more than EUR 5 billion from European funds. This



programme, which was prepared by the Ministry of the Environment of the Czech Republic in cooperation with the European Commission brings to the Czech Republic funds to support the individual projects in a number of areas, among which the most important one and also the largest one in terms of the amount of financial resources is the Priority Axis I — Improvement of Water Management Infrastructure and Reduction of Flood Risk, supporting projects aimed at improving the status of surface waters and groundwaters, the quality and supply of drinking water and at reducing flood risk.

In 2011, two major flood situations reaching Flood Activity Degree III were recorded in January. They were caused by accelerated thawing of snow cover due to significant warming in combination with rainfall. The most significant increases in water level were shown by watercourses in the Berounka River and the Ohře River basins. The issue of floods continues to be highly relevant and in the recent years the attention of the public has been focused in particular on flood control and remedying of flood damages. The Blue Report provides detailed information about projects and financial resources in this field. Flood control measures are supported under the Priority Axis I of the Operational Programme Environment where the sum of more than EUR 100 million has been allocated for flood risk reduction in the years 2007–2013. The ever more discussed category of flood control measures includes the so-called nature-friendly flood control measures, for which it is possible to use also financial support from the Priority Axis 6 of the Operational Programme Environment called Improving the State of Nature and Landscape and Optimization of Landscape Water Regime.

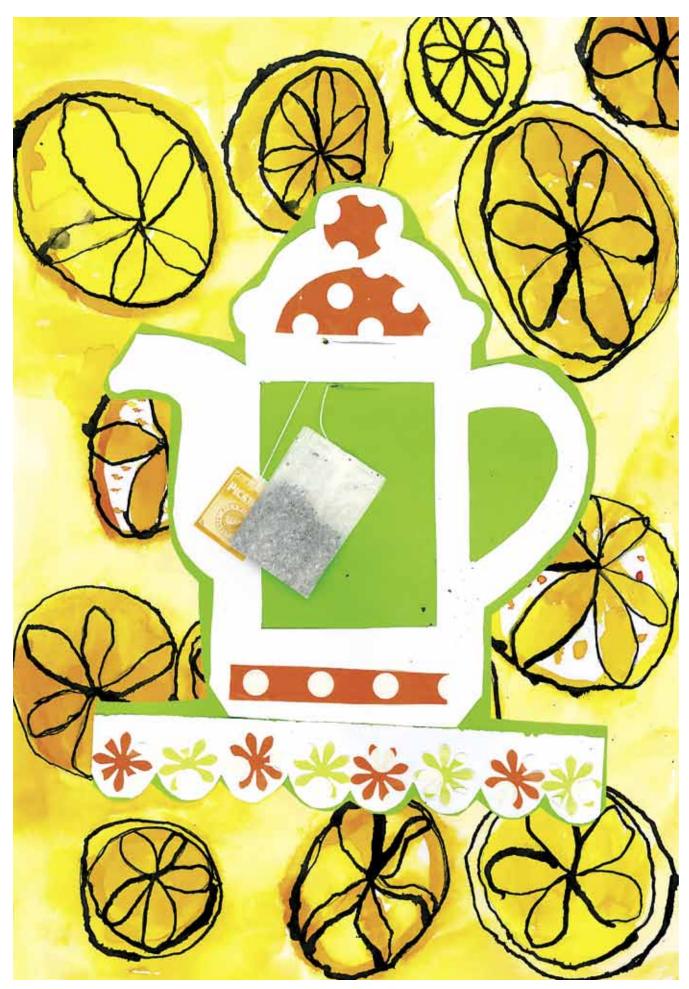
I trust that the Blue Report for the year 2011 will not only provide you with valuable information about water in the Czech Republic but also contribute to raising the awareness that water belongs to the riches of nature which must be valued and that its protection and daily use cannot be taken for granted and comprise a number of activities requiring considerable efforts to ensure them.

Tomáš Chalupa Minister of the Environment of the Czech Republic

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# I. Hydrological balance

#### I.I Temperature and precipitation

In terms of temperature, the year 2011 with the mean air temperature of 8.6 °C showed the average. The temperature variation of 1.1 °C from the average  $N_{1961-90}$  represented the next one of the positive annual values that in the previous 25 years have clearly dominated.

The winter period 2010-2011 was not extremely cold (I.I°C below the average). It started with very cold December showing the mean temperature of -4.9 °C (i.e. 3.9 °C below the average). January 2011, on the contrary, was a relatively warmer month with the mean temperature of -1.2 °C (1.6 °C above the average). February, the last winter month, showed the mean temperature of -1.9 °C. Spring months showed favourable temperature values, with the mean temperature of 9.2 °C having exceeded the average by almost 2 °C. In addition to March and May, this was mainly contributed to by exceptionally warm April with the mean temperature of 10.5 °C. April thus has become the relatively warmest month of the year - over the last 38 years it was the fourth warmest April (after April 2007, April 2000 and April 2009) in the Czech Republic. April also contributed significantly to the average temperature of 15 °C for the growing period, whose value was by 1.5 °C higher than usual. The highest mean monthly temperature in 2011 was recorded in August (18 °C, i.e. 1.6 °C above the average). For the rest of the year, during summer and autumn, there alternated relatively average and warm months, albeit with slight variations. The year 2011 ended with warm December showing the mean temperature of 1.9 °C, it was the second relatively warmest month of the year with the positive variation of 2.9 °C; similarly to April it may be described as the fourth warmest over the last 38 years.

In terms of the total precipitation amount, the year 2011 on the territory of the Czech Republic showed the average. The average precipitation amount on the entire territory of the Czech Republic reached 634 mm, which corresponds to 94% of the long-term precipitation average  $N_{1961-90}$ . Compared to the previous wet year 2010, it can be stated that this value was almost by 240 mm lower.

In terms of the total precipitation amount distribution in the individual main river basins, relatively the highest rainfall amount was recorded in the Elbe River Basin (with missing only about 5% of the average), less then in the Oder River Basin and the Morava River Basin with missing approx. 20% of the annual average. Both

winther and spring can be described to show the precipitation average, summer slightly above the average. Relatively the poorest was autumn with 66% of the average.

In the course of the year 2011, mostly months with precipitation amounts ranging around the average alternated with dry months, only July can be described as very moist. The predominance of dry months was especially pronounced in the first quarter, when very dry February with only II mm of precipitation (28% of the average) was followed by dry March with 30 mm and April with 35 mm (75% of the average) of precipitation. Gradually worsening precipitation deficit was stopped by May with rainfall amount ranging around the average (67 mm, 91% of the average) and June (82 mm, 98% of the average). Then the deficit was compensated by significantly above-average rainfall in July (146 mm, 185% of the average). July rainfall amounts were more abundant especially in the northern regions of the Czech Republic, having faded towards the southeast. Compensation of the rainfall deficit was stronger in the Elbe River Basin, weaker then in the Oder River Basin and the Morava River Basin. Precipitation amounts in August (89% of the average), September (94% of the average), October (107% of the average) and December (120% of the average) ranged around the average (except for values below the average in September in the northeast of Moravia and in November on the entire territory of the Czech Republic). In the period from 27 October to 29 Novemeber, rainfall throughout the country was almost absent or only sporadic and in negligible amounts. November, with an extremely low total precipitation amount of I mm only (corresponding to only 1% of the average), noted a number of records in the historical series of observations. It was the driest November on the territory of the Czech Republic since 1961 - in Bohemia it was the driest November since 1876 (November 1920 - 3 mm; November 1953 - 8 mm). With a monthly total of I.I mm, for example, in Prague in Clementinum meteorological measuring station, November 2011 became the driest November in the history of observations from 1804. Extremely dry November caused the Elbe River Basin to return to a deficit rainfall balance - in the Moravian river basins (due to weaker precipitation in September) it led to a somewhat greater annual deficit of approx. 20%.

Relatively the driest was the Dyje River Basin with less than 90% of the average (with frequent areas of deficit rainfall below 75% of the average), especially in the Českomoravská Upland and Drahanská Upland. Only somewhat better was the situation in the Morava River Basin (upstream of the Dyje River) and in

Table 1.1.1
Renewable water sources in the years 2002-2011 in millions of m<sup>3</sup>

Itama	Annual values										
Item	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Precipitation	71,298	40,695	53,629	57,730	55,837	59,544	48,818	58,676	68,692	49,449	
Evapotranspiration	48,533	29,319	41,473	42,872	37,617	46,194	37,394	44,090	46,824	35,511	
Annual inflow 1)	1,341	524	640	781	I 070	637	462	714	781	482	
Annual runoff 2)	24,106	11,900	12,796	15,639	19,290	13,987	11,886	15,300	22,649	14,420	
Surface water sources 3)	6,506	3,758	4,270	5,489	5,317	4,673	4,503	5,112	8,788	5,770	
Usable groundwater sources 4)	1,625	1,195	1,224	1,305	1,345	1,244	1,209	1,266	1,594	1,340	

 $Source: \ Czech \ Hydrometeorological \ Institute$ 

Note.: <sup>1)</sup> Annual inflow to the territory of the Czech Republic from neighbouring states.

<sup>&</sup>lt;sup>2)</sup> Annual runoff from the territory of the Czech Republic.

<sup>&</sup>lt;sup>3)</sup> Determined as the flow in the main catchment areas with 95% probability.

<sup>&</sup>lt;sup>4)</sup> A qualified estimate, specification in more detail is published by Czech Hydrometeorological Institute not sooner than the second half of 2012.

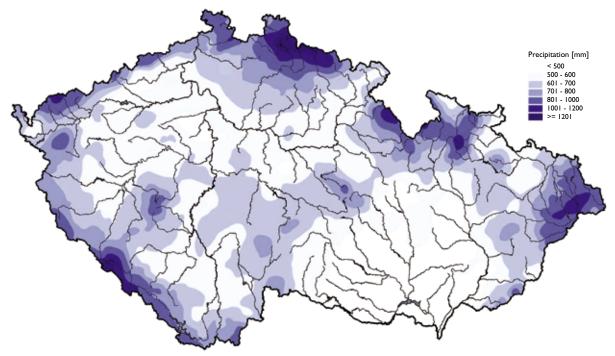
the Oder River Basin. Also the upper Elbe River Basin and the upper Otava River Basin showed a dominance of rather below-average precipitation. Relatively the highest precipitation was received in the Berounka River Basin, the Ohře River Basin and basins of right-hand tributaries of the lower Elbe (usually 100 to 125% of the average).

More intense precipitation events causing local flooding of watercourses or greater floods were far from reaching the frequency as in the previous year 2010. In 2011, only two major flood situations occurred in January and July; in some regions

there were also minor flooding in March, April, June, August, October and December.

Water supplies accumulated in the snow cover in 2011 in the majority of the monitored river basins largely ranged around the average or slightly below the average, compared to the previous winter periods. At the beginning of the year, snow supplies, compared to the previous years, were generally above the average, mainly in the Berounka River Basin, otherwise the year 2011 as a whole in terms of supplies was rather poor, especially in the southeastern part of the Czech Republic.

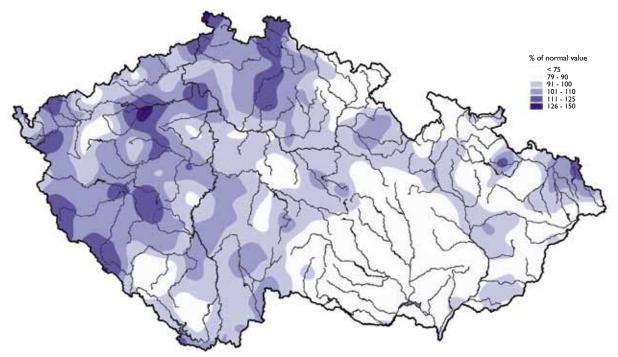
Figure 1.1.1
Total precipitation amount in the Czech Republic in 2011 in mm



Source: Czech Hydrometeorological Institute

Figure 1.1.2

Total precipitation amount in the Czech Republic by % of the average over the period 1961–1990



Source: Czech Hydrometeorological Institute

#### I.2 Runoff

In terms of runoff, the year 2011 reached values between the average and slightly below the average. Average annual flows in catchment areas of the Elbe, the Oder River, the Olše River and the Morava River ranged between 80 and 95%  $\mathbf{Q}_{a}$ . This level was slightly exceeded only by the Berounka River with 114%  $\mathbf{Q}_{a}$ . The most significant flood situations occurred in January and July.

As a result of warming, rainfall and subsequent snow cover thawing, January was the most water-abundant month of the year. Most of the monitored watercourses reached the double, the Sázava River and the Ohře River the triple and in the Berounka River Basin almost the quadruple values of Q. The beginning of the year with considerably above-average flow rates (January to mid-February) was gradually followed by a period with below-average flow rates, which lasted until the end of June. At the beginning of the second quarter (July, August) of 2011, the watercourses generally showed slight increases of water rates, more significant mainly in the north of Bohemia (the Jizerské hory Mountains and the Orlické hory Mountains) and in the east of Moravia (the Beskydy Mountains). In these months, the highest flow rates were recorded in the Orlice River, the upper Morava River, the Lužická Nisa River and the Smědá River catchment areas (2 to 5 times Q\_). Then, until the end of the year, flow rates showed average to belowaverage values. The lowest water rates in 2011 were shown in November, with the values ranging usually between 40 and 60% Q<sub>xi</sub>, on Moravian watercourses especially in the Oder River, the Olše River and the Bečva River catchment areas the flow rates reached the values of only between 10 and 20% Q<sub>vi</sub>.

Ice phenomena due to the temperature formed only rarely, especially at the end of January, at the beginning of February and at the turn of the second and the third decade of February. It was mostly ice near the banks, floating ice and continuous ice cover. In March, ice phenomena no longer occurred, or only sporadically on minor mountain streams. Mean water temperature in watercourses in July and August reached from II.0 to 21.0 °C. The warmest parts of the Czech rivers in this period were the middle Elbe, the lower Morava River and the Dyje River where even at the end of August the temperatures of as much as 24.0 °C were reached.

The levels of most reservoirs during the year showed a generally sustained to slightly declining trend. Greater stability of filling the storage space is evident from the monitored reservoirs especially



Runoff from hydraulic structure Nechranice – flood in January 2011

in the VItava River Basin, smaller then in the Berounka River, the Ohre River, the Elbe, the Oder and the Morava River basins, which in the second half of the year showed more frequently a slight decline or greater fluctuations of water level. With the exception of technical manipulations (e.g. hydraulic structure Skalka and hydraulic structure Brněnská), the highest levels were recorded at the beginning of the year due to the effects of snow thawing, i.e. in January, and after a slight decline again in March and once again due to rainy weather and increased flow rates also at the turn of July and August, especially in the Elbe, the Berounka River and the Oder River basins. Between these peaks there dominated slight fluctuations of water levels or quite steady storage. At places, more significant water level declines or fluctuations occurred in the drier part of the year, roughly from August to December, when also relatively smallest storage was recorded.

#### 1.3 Groundwater regime

The year 2011 was not favourable for groundwater recharge. Both shallow aquifers and deeper groundwater horizons showed the absence of usual spring maximums and were characterized by slight and sustained declines of water levels and yields throughout the year. Yet, in terms of groundwater, in the overall average it was a normal year.

At the beginning of the year, groundwaters were favourably influenced by the previous water-abundant period. Groundwater levels in wells and spring yields, compared to long-term averages, showed high values throughout the country. The wells showed 8-30% of the value determined according to the long-term monthly cumulative frequency curve (calculated for the period between 1971 and 2000, the value < 50% indicates the above-average status, the value > 50% indicates the belowaverage status), the springs then showed 28-44% of the longterm monthly cumulative frequency curve. Favourable weather conditions and precipitation during January contributed to a further increase in the majority of the measured values to reach for wells 5-19% of the long-term monthly cumulative frequency curve and for springs 17-34 % of the long-term monthly cumulative frequency curve. For 90% of shallow wells and 80% of springs the end of January and/or early February represented the annual maximum. On most of the territory of the country, usual groundwater recharge failed to occur. Only springs in the southern regions (the upper Vltava River and the Dyje River catchment areas) in April showed a short-term increase in the yields, comparable to the January values. Then a downward trend reappeared there as well, similarly to other regions. Despite a steady decline of groundwater levels and yields their measured values ranged around values close to long-term averages that are usual for the summer period. Smaller declines were recorded for groundwaters in the regions of the Dyje River catchment area, greater declines were recorded in the northwest in the Oder River and the Morava River catchment areas, in both shallow aquifers and deeper groundwater horizons. Rainfall in May in the Oder River catchment area stopped in this region declines of groundwater levels and yields at 66% and 60% of the long-term monthly cumulative frequency curve and caused them to return to average values. The minimum values on monthly exceedance curves were reached for the majority of the measured wells in high summer at the turn of June and July, with significant differences in groundwater levels in different regions. Groundwater levels and yields for wells ranged between 42 and 69% of the long-term monthly cumulative frequency curve (the Dyje River and upper Elbe catchment areas) and for springs between 48 and 81% of the long-term monthly cumulative frequency curve (the Oder River and the Morava River catchment areas).



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## 2. Flood situations in 2011

#### 2.I Flood courses

In 2011 in January, two major flood situations reaching Flood Activity Degree III (hereinafter referred to as "FAD") were recorded. They were caused by accelerated thawing of snow cover due to significant warming in combination with rainfalls. Most marked increases of water level were recorded for watercourses in the Berounka River and the Ohře River catchment areas.

The first flood wave occurred between 7 and 10 January mainly in the Berounka River and the Ohře River catchment areas. FAD III level was exceeded only on the Radbuza River at Staňkov, Lhota and České Údolí profiles, the highest flow was recorded in Lhota at a level of between  $Q_5$  and  $Q_{10}$ . FAD II levels were exceeded at the profiles on the Radbuza River (Tasnovice), the Úhlava River (Tajanov, Štěnovice), the Úslava River (Koterov), the Berounka River (Plzeň - Bílá Hora, Zbečno), the Klabava River (hydraulic structure Klabava) and the Střela River (Plasy). On other watercourses, water levels rose to reach max. FAD I level. Culminations occurred mostly from 8 to 9 January.

The second wave of water level rises (in terms of reached culminations larger) started at the end of the first decade of January, with culminations having been recorded mainly between 14 and 17 January. At the end of the second decade of January, water levels of most of the monitored watercourses showed a downward trend.

In the upper Elbe catchment area, FAD III was exceeded at the profiles on the Cidlina River (Sány) and on the Orlice River (Týniště nad Orlicí) at a level of between  $Q_2$  and  $Q_5$ . On the Metuje River, the Doubrava River, the Bystřice River, the Jizera River, the Mrlina River and on the upper and middle stretches of the Elbe, FAD II was reached. In the VItava River catchment area, most significant water level rises (by up to 2 m) were recorded in the upper Berounka River, the Lužnice River, the Blanice River and the Sázava River catchment areas. Most afflicted by floods were again watercourses in the Berounka River catchment area, with FAD III having been exceeded at the profiles on the Kosovský potok stream (Svahy-Třebel), the Úhlavka River (Stříbro), the Úterský potok stream (Trpisty), the Mže River (Stříbro) and downstream of the hydraulic structure Hracholusky, the Radbuza River (Tasnovice, Stankov), the Úslava River (Koterov), the Klabava River (Hrádek) and downstream of the hydraulic structure Klabava, on the Střela River (Žlutice, Čichořice) and at the profiles on the lower stretch of the Berounka River (Zbečno, Beroun). The highest flow with a peak flow return period of between  $\boldsymbol{Q}_{\boldsymbol{l}0}$  and  $\boldsymbol{Q}_{\boldsymbol{2}0}$  was recorded on the Úhlavka River in Stříbro and  $Q_{20}$  on the Úterský potok stream in Trpísty. FAD III at a level of  $Q_2$  was recorded on the Lužnice River in Bechyně and at a level of  $Q_{10}$  on the Skalice River at the Zadní Poříčí profile. FAD II level was exceeded on the Sázava River, the Lomnice River, the Skalice River, the Úhlava River, the Klabava River and on the lower stretch of the Vltava River in Vraňany, at the Chuchle profile the water level was kept close below the FAD II level through manipulations at the hydraulic structure Vrané. Other watercourses did not show so significant water level rises. As a result of fulfilment of and unregulated discharge from the hydraulic structure Hracholusky, peak flow was recorded on 16 January on the upper stretch of the Berounka River in Bílá Hora, at FAD II level.

In the lower Elbe and the Ohře River catchment areas, FAD III was exceeded on the Ohře River in Cheb, Karlovy Vary and Louny, on the Bílina River in Trmice, on the Ploučnice River in Česká Lípa, on the Mandava River in Varnsdorf, on the Kamenice River in Hřensko and on the lower Elbe in Mělník, Ústí nad Labem and Děčín profiles. FAD II was reached on the Teplá River, the Řasnice River and the Panenský potok stream. Peak flows reached the level of up to  $Q_{20}$  on the Kamenice River and the Teplá River. The lower Elbe water level rose due to inflow from the upper and middle parts of the catchment area and especially from the VItava

River catchment area. The profiles in Ústí nad Labem and Děčín showed FAD III level between 14 and 19 January.

All the above-mentioned flood situations were documented in detail, the respective reports are available at the Czech Hydrometeorological Institute.

#### 2.2 Remedying flood damages

The programme 229 110 "Remedying flood damage to state-owned water management property" included in 2011 the following sub-programmes:

- 229 II6 "Remedying of the impacts of floods in the year 2009" – the sub-programme implementation is under way.
   Deadline for the sub-programme completion was extended until 31 December 2012 by a letter of the Ministry of Finance, ref. No. MF 19/97606/2011-194, dated 14 November 2011.
- 229 117 "Remedying of the impacts of floods in the year 2010" – the sub-programme implementation is under way.
   The expected date of completing this sub-programme implementation is 30 June 2013.

The applicants for support aimed at the remediation of flood damage to state-owned water management property are the River Boards, s. e. and the Forests of the Czech Republic, s. e.

The objective of the programme 229 II0 is to remedy flood damage to state-owned water management property in order to ensure a trouble-free function of stream channels and water management structures.

Programme 129 140 "Support for remedying flood damage to infrastructure of water supply systems and sewerage systems" included in 2011 the following sub-programmes:

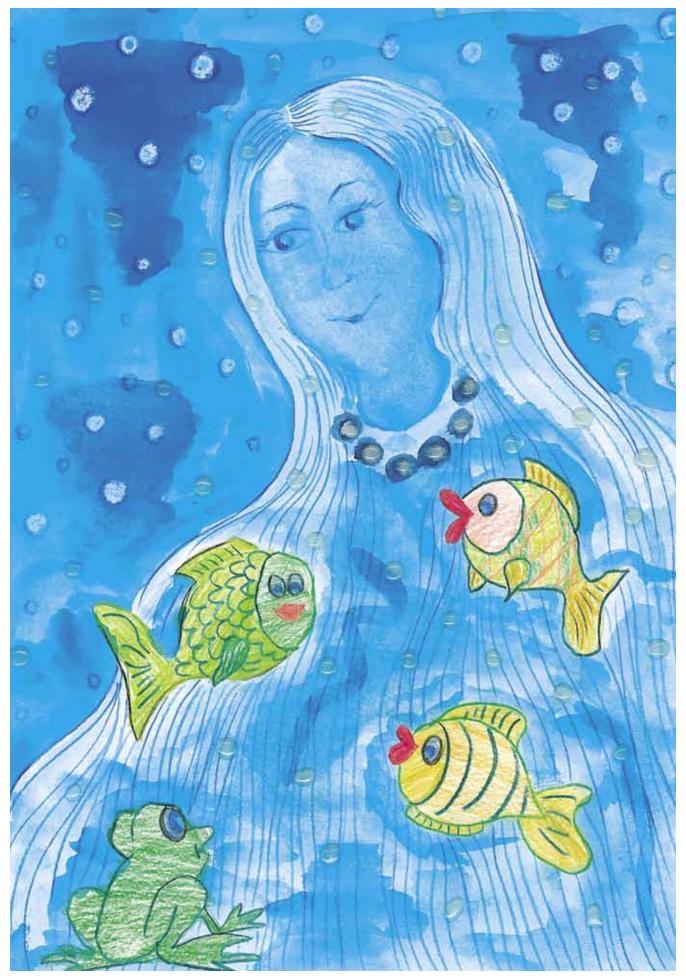
- 129 142 "Support for remedying flood damage caused by floods in 2009" – the sub-programme implementation is under way,
- 129 143 "Support for remedying flood damage caused by floods in 2010" this sub-programme was established in response to flood situations in the given year. The expected date of completing this sub-programme implementation is 31 December 2012. The applicants for support for remedying flood damage to infrastructure of water supply systems and sewerage systems are municipalities, associations of municipalities and water management joint-stock companies with the majority equity participation of towns and municipalities.

The financial performance of the above-mentioned subprogrammes under the programmes 229 IIO and I29 I40 is included in chapter 9.1 of this report.

Ministry of the Environment launched a programme II5270 "Remediation of Damage Caused by Natural Disasters". Under this programme, a sub-programme II5271 Floods 2010 was established by the Ministry of the Environment. Through this sub-programme, the Strategy of Recovery of Land and Property adopted by the Resolution of the Government of the Czech Republic No. 556/2010 of 4 August 2010 and No. 692 of 29 September 2010 is implemented.

The measures which can be implemented under this sub-programme are as follows:

- I. Reconstructions, repairs of waste water treatment plants and sewerage systems,
- 2. Decontamination of land,
- Decontamination or remediation of other damage to surface waters and groundwaters, including wells,
- Rehabilitation of damage to migration passability and recovery of ecological stability of landscape,
- 5. Recovery of natural function of watercourses.



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# 3. Quality of surface waters and groundwaters

#### 3.1 Surface water quality

Current surface water quality in comparison with the 1991–1992 two-year period

The map of the quality of waters in selected watercourses of the Czech Republic was produced with regard to both the 1991–1992 two-year period and the 2010–2011 period, under CSN 75 7221 standard Water Quality – Classification of Surface Water Quality.

Every year the Report on Water Management in the Czech Republic compares the current status of water quality to the status of water quality in the 1991–1992 two-year period. With regard to the scope of indicators monitored at that time, only a basic classification could be used for this comparison. Figure 3.1.2 shows that despite significant improvement of water quality, some river stretches (though very short ones) in the Czech Republic are still classified in water quality Class V.

To produce the above presented map of quality of water in watercourses of the Czech Republic for the period 2010–2011, river basin administrators provided the data from 312 profiles of the water quality monitoring network. The respective monitored hydrometric profiles are classified in the following water contamination classes under the CSN 75 7221 standard:

Class I: unpolluted water – surface water status that was not significantly affected by human activity, with water quality indicators that do not exceed values corresponding to the natural standard background in the respective watercourse,

Class II: slightly polluted water – surface water status that was affected by human activity to an extent that water quality indicators attain values allowing the existence of a rich, balanced and sustainable ecosystem,

Class III: polluted water – surface water status that was affected by human activity to an extent that water quality indicators attain values that may not be conducive to conditions allowing the existence of a rich, balanced and sustainable ecosystem,

Class IV: heavily polluted water – surface water status that was affected by human activity to such an extent that water quality indicators attain values that are conducive to conditions allowing the existence of only an unbalanced ecosystem,

Class V: very heavily polluted water – surface water status that was affected by human activity to such an extent that water quality indicators reach values that are conducive to conditions allowing the existence of only a heavily unbalanced ecosystem.

#### Radioactivity

In surface waters radiological indicators are monitored on a long-term basis in selected hydrometric profiles of the national monitoring network. These profiles are situated at locations of nuclear facilities currently in operation and in watercourse stretches affected by the discharge of mine waters and by the seepage from refuse dumps at locations where uranium ores were formerly mined or treated. In 2012, the resulting statistical characteristics for the year 2011 were submitted by the Ohře River Board, the Vltava River Board and the Morava River Board state enterprises.

In 2011, the annual average volume activity of tritium in surface waters of the Vltava River in the hydrometric profile Vltava

Solenice downstream of the outlet of waste waters from the Temelín nuclear power plant reached the value of 26.1 Bq/l, in the hydrometric profile Vltava Praha the value of 11.5 Bq/l and in the hydrometric profile Elbe Hřensko the value of 5.0 Bq/l.

The annual average volume activity of tritium downstream of the outlet of waste waters from the Dukovany nuclear power plant in the hydrometric profile Jihlava downstream of the Mohelno reservoir reached the value of 78.4 Bq/l and in the hydrometric profile Jihlava Ivančice the value of 41.9 Bq/l. The detected values are in compliance with environmental quality standards for tritium in surface waters according to the Government Decree No. 61/2003 Coll., as amended. Total volume activity alpha and beta was also detected in values fully meeting environmental quality standards. Other activation and fission products produced during nuclear power plant operations were not detected. Low volume activities of strontium 90 and cesium 137 corresponding to the residual contamination after atmospheric tests of nuclear weapons and the Chernobyl Nuclear Power Plant accident in last century were detected.

In the vicinity of uranium ore deposits in the Příbram area, in surface waters of the Kocába River at the Višňová hydrometric profile and in the Drásovský stream at the Drásov profile, increased values of radiological indicators are every year repeatedly detected (under the CSN 75 7221 standard, surface water quality values corresponded to Quality Class V).

The area of the Stráž pod Ralskem deposit, in terms of total volume activity alpha, can be stated to have met the environmental quality standard values in all hydrometric profiles (also in the traditionally most critical Ploučnice – Noviny profile, where the total average volume activity alpha reaching the value of 0.17 Bq/l was very close to the environmental quality standards set by the Government Decree No. 61/2003 Coll., as amended). Total activity beta in all of the monitored hydrometric profiles was not exceeded.

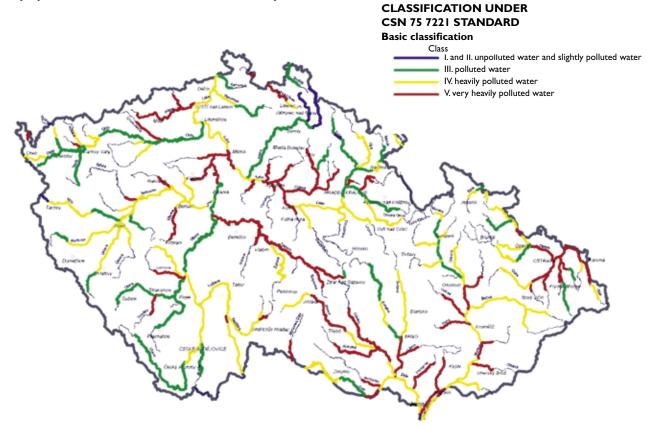
#### Water quality in water reservoirs and other reservoirs

On the territory of the Czech Republic, the year 2011 with the mean annual air temperature of 8.6 °C ranged around the average. The average precipitation amount on the entire territory of the Czech Republic reached 634 mm, which represents 94% of the long-term precipitation average. A number of water reservoirs, nevertheless, showed the eutrophication of water (i.e. the process caused by increased contents of mineral nutrients, especially phosphorus compounds, and to a smaller extent also nitrogen compounds in waters).

Within the framework of water quality monitoring by the Elbe River Board, s. e., in total sixteen water reservoirs are continuously monitored. Detailed monitoring including regular evaluation was performed for five water supply reservoirs and for five reservoirs with waters used for bathing. For another six water reservoirs, only a limited monitoring was performed. Ten water reservoirs were subjected to a regular limnological examination in vertical lines defined in a longitudinal profile of the water reservoir. Physico-chemical, chemical and biological values were measured within this examination. In terms of the total precipitation amount, the year 2011 at the monitored water reservoirs can be evaluated as slightly below the average, and in terms of annual inflow volume largely as below the average. A reduced hydrological balance was predominantly affected by dry spring and very dry November. In terms of water quality

Figure 3.1.1

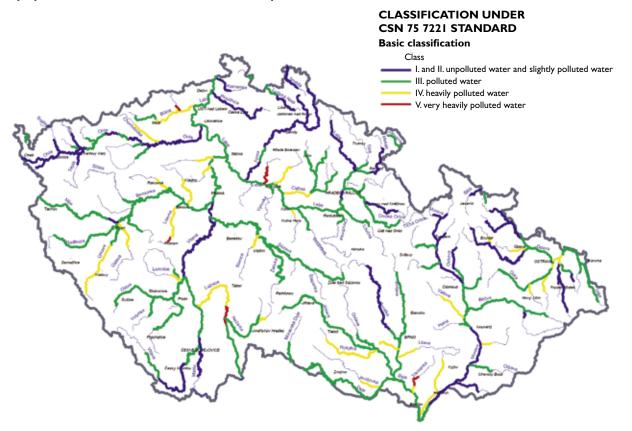
Quality of water in watercourses in the Czech Republic in 1991–1992



Source: T. G. Masaryk Water Management Research Institute, public research institution, based on the data from the Czech Hydrometeorological Institute

Figure 3.1.2

Quality of water in watercourses in the Czech Republic in 2010–2011



Source: T. G. Masaryk Water Management Research Institute, public research institution, based on the data from River Boards, s. e.

development, however, the most important role was played by a rainfall-rich period in June and July. In spite of the fact that high summer was rather colder, increased supply of nutrients caused an excessive development of cyanobacteria at some of the reservoirs. In terms of water temperatures, the vegetation period can rather be assessed as slightly below the average. Nonetheless, the conditions for a higher primary production were quite favourable. The reason for that was not only a supply of nutrients after a dry spring season, but also a very early onset of high temperatures in April. In terms of water quality development, rather trouble-free were the water reservoirs in the Jizerské hory Mountains - Souš and Bedřichov (however, it is important to note that an extraordinary activity involving continuous monthly monitoring from the beginning of 2011 was required by the development of picocyanobacteria of the Merismopedia family at the water supply reservoir Josefův Důl in the Jizerské hory Mountains). Potential impairment in the snow thawing period in this area was eliminated by aerial application of very fine-ground limestone between 26 and 27 April. Trouble-free water reservoirs in 2011 included Vrchlice, Mšeno in Jablonec nad Nisou, Harcov in Liberec and Labská in Špindlerův Mlýn. Higher rainfall activity and high flow rates at the beginning of summer influenced an increased occurrence of cyanobacteria and green algae at Hamry water reservoir (over 60 mg/l chlorophyll-a). To increase the quality of raw water, regulatory catching of accompanying fish species associated with the long-term ichtyological survey was performed there. At the water supply reservoir Křižanovice, water quality reached the average (over 15 mg/l chlorophyll-a, transparency 100-200 cm). In August, at the water reservoir Pastviny, due to the development of cyanobacteria, impaired water quality with a risk to sensitive individuals was detected. As the reservoir is located in the mountainous area and water temperature is lower than in other reservoirs used for recreational purposes, the development of cyanobacteria did not reach the level enough to significantly affect recreation. The water reservoir Rozkoš, on the contrary, in summer showed an excessive development of cyanobacteria. On I September 2011, this was the reason for imposing ban on bathing at this location. A critical situation occurred in the water reservoir Seč (mass development of water bloom). This virtually led to a termination of recreational season as early as the end of July, and on 25 July 2011 ban on bathing was imposed. The poorest water quality was traditionally at highflow water reservoirs Les Království and Pařížov.

In 2011, water quality in reservoirs administered by the Vltava River Board, s. e. largely anged within a usual year-to-year variability. The recreational water reservoir České údolí on the Radbuza River, which is permanently hypertrophic with a mass occurrence of cyanobacteria, was inappropriate for bathing. In connection with increased flow rates in summer, at the Lipno water reservoir on the Vltava River, exceedingly strong development of water bloom from July to September was recorded, with the highest cyanobacteria biomass over the last few years. At the Orlík water reservoir on the Vltava River there occurred a shift of water bloom of cyanobacteria to the lower half of the reservoir. Relatively favourable situation was observed at the Hracholusky water reservoir on the Mže River. The Slapy water reservoir experienced the development of algae and cyanobacteria unusually not sooner than in September and October, i.e. beyond the main holiday season. This water reservoir is permanently loaded with export of oxygen deficits from the Orlík water reservoir. At the Římov water supply reservoir on the Malše Rive, quite a strong development of phytoplankton affected mainly the middle part of the reservoir from July to September, nevertheless, with no effect on impairment of the quality of raw water. The Švihov water reservoir on the Želivka River in 2011 was again characterized by a very good water quality. The Lučina water supply reservoir on the Mže River

was, as usual, affected by water bloom of cyanobacteria, which impaired the quality of raw water, nevertheless, the situation in 2011 can be described as ranging around the average. A considerable problem are also acidified water supply reservoirs that respond to changes in chemistry of precipitation water by increasing the contents of humic substances and water trophy. These reservoirs also include the Karhov water supply reservoir on the Studenský stream. Furthermore, the acidified water reservoirs include, in the long run, the reservoirs at the Příbram area (Láz, Pilská, Obecnice) and the reservoirs Lučina and Římov.

In the area administered by the Ohře River Board, s. e., the quality of water was continuously monitored and according to the results of zonal measurement it ws not necessary to carry out desludging. In autumn months, increased recovery of cyanobacteria at the Stanovice water reservoir was observed, nevertheless, drinking water supply for the Karlovy Vary area was not threatened. Due to the quantity, water abstraction was limited only from the Křímov reservoir, where in October and November measures to reduce water abstraction had to be taken by Central Bohemian Water Supply and Sewerage Systems, a. s. (partial discharge due to reconstruction and subsequent drought).

In the area administered by the Morava River Board, s. e., the growing season 2011 was particularly affected by below-average summer temperatures. In the composition of phytoplankton, this was manifested by the absence of massive cyanobacterial blooms, consisting of one taxon, especially monoculture of Microcystis aeruginosa, common in eutrophic water reservoirs (Brno reservoir, Vír, Mostiště, Boskovice, Fryšták) in previous years. The exception proving the rule was a small, hypertrophic Jevišovice Dam, where cyanobacteria generated intensive water bloom from June until autumn. In this case as well, however, more taxa changed which did not lead to a clear dominance of one species. Other water reservoirs during the summer showed the development of diatoms (mainly Fragilaria crotonensis), cryptophytes, dinophytes and desmidiales. Worth mentioning is mainly massive development of cryptophytes in a small water reservoir at Moravská Třebová in July and centric diatoms Actinocyclus normanii in the Nové Mlýny system of reservoirs from August to autumn. In water supply reservoirs, the highest occurrence of algae biomass was recorded in Mostiště in September, with an exceptionally strong occurrence of desmidiales species Staurastrum messikommeri and dinophyte Ceratium furcoides. Extremely strong turbidity in the Vír water reservoir in July was caused by diatoms Fragilaria crotonensis. In most water reservoirs in summer 2011 there occurred weak cyanobacterial water bloom, either complementing other algal communities or insignificantly dominating. Water bloom was always composed of a mixture of different genera Anabaena, Aphanizomenon, Microcystis and Woronichinia.



Hydraulic structure Hamry, the Chrudimka River

The quality of raw water in the area administered by the Oder River Board, s. e., at the Šance, Kružberk and Morávka reservoirs in 2011 was very good and did not require more complex treatment to achieve drinking water. At the Kružberk water reservoir, during the summer months, the occurrence of cyanobacterial genera Anabaena, Microcystis and Aphanizomenon was observed, however, their total biomass was not significant. As regards reservoirs for purposes other than water supply administered by the Oder River Board, s. e., slightly impaired water quality was in the Žermanice water reservoir, however, development of compact water bloom was not recorded. A partial problem with the occurrence of cyanobacteria was faced at the Baška and Olešná water reservoirs.

## Quality of water used for bathing during the bathing season 2011

The most frequent problems with water quality are connected with a huge presence of cyanobacteria, which every year results in imposing ban on bathing in some localities.

The Act No. 258/2000 Coll., on the protection of public health, as amended, regulates the rights and obligations of natural and legal persons, which must be met in the area of protection and promotion of public health; the Act further establishes a system of public health protection bodies, their scope of activity and authority. One of the areas that is protected by this Act, is outdoor bathing, operation of outdoor bathing pools, artificial bathing pools, swimming pools and saunas. Decree No. 238/2011 Coll. regulates the equipment of outdoor bathing pools and the requirements for the sampling method and frequency of inspection and also bathing water quality requirements.

Under current legislation, the list of outdoor bathing sites to be subjected to the monitoring of the quality of water used for bathing is annually, before the start of summer recreational season, published, updated and complemented mainly on the basis of comments made by the public. Important role in this area is played by an amendment to the Water Act, because one of the major changes compared to the former Directive 76/160/ EEC is that Member States should not only monitor the quality of water and inform the residents, but where the quality of water used for bathing is not satisfactory, the country must take active measures to remedy the situation. For each bathing site that is included in the list of the monitored outdoor bathing sites there must be prepared the so-called "bathing water profile", in which, among other characteristics sources of pollution, proposals for remedial measures in the river basin, etc. are described. A related legislative regulation to the Water Act is Decree No. 155/2011 Coll., on profiles of surface waters used for bathing.

The most frequent problems with water quality are connected with a huge presence of cyanobacteria, which resulted in imposing a ban on bathing in certain localities. In the bathing season 2011 this was the reason for imposing in total 13 bans on bathing. Due to exceeding the limits of microbiological indicators, one of the bathing sites was classified in the category of poor quality.

#### Salmon and carp waters in the year 2011

Salmon and carp waters are designated by legislation as surface waters which are suitable for the life and reproduction of the indigenous fish species and other aquatic animals (pursuant to the Government Order No. 71/2003 Coll., on the designation of surface waters which are suitable for the life and reproduction of the indigenous fish species and other aquatic animals and on detecting and assessing the status of quality of these waters, in the wording of the Government Order No. 169/2006 Coll).

For the purposes of this report, in accordance with the procedures set by the applicable legislation, the assessment of the period 2010–2011 was performed only for the data available from less than half of reaches (48% of hydrometric profiles demarcating the delimited waters) and only for profiles in the lower reaches of watercourses in the Czech Republic. They provide, similarly to the previous year, only a framework information on meeting pollution limits for salmon waters and carp waters in the Czech Republic. Government Order No. 71/2003 Coll. (similarly to the Directive 2006/44/EU) allows in the event that no sufficient number of data or data structure are available, to assess whether pollution limits are met according to the maximum value measured for the given period.

Based on the assessment of the available data collected in hydrometric profiles demarcating the delimited waters it was established that in the period 2010–2011 pollution limits under the order were met for 65% of the assessed hydrometric profiles (69% of salmon waters and 62% of carp waters), i.e. impairment by approx. 10%, compared to the previous year.

For most of the assessed hydrometric profiles failing to meet pollution limits for fish waters this is caused by excessive values of ammonia ions. The target limits for ammonia ions are met only by two of all assessed hydrometric profiles. With regard to lack of data it was not possible to assess whether the limits for free ammonia, which is toxic to fish, were met. For the assessment, therefore, only the value of concentration of ammonia ions (without softening) was used, which is allowed by the Government Order No. 71/2003 Coll. (similarly to the Directive 2006/44/EU). A low concentration of dissolved oxygen in the hydrometric profiles was detected for five assessed waters.

#### Quality of suspended matter and sediments

The quality of surface waters is also assessed from the viewpoint of quality of suspended matter and sediments as integral parts of the aquatic environment. The constant matrix is preferably bound to by numerous pollutants, whose detection in water samples is often problematic, failing to provide reliable information on the occurrence of the pollutant in watercourses. In the year 2011, the monitoring of the chemical status (quality) of suspended matter and stream sediments, due to reduced financial resources for the monitoring was carried out, compared to originally 47 hydrometric profiles of the complex monitoring in the previous year, only in 32 profiles on main watercourses and their significant tributaries in the Czech Republic. This was carried out under the monitoring programme, which followed up with the surveillance monitoring programme conducted in the years 2007-2010.

In 2011, the monitored indicators were contents of heavy metals, metalloids and specific organic substances, including the majority of priority pollutants with relevance to the constant matrix (Annex II of the Directive 2008/105/EC), and other potentially hazardous substances with possible endocrine and toxic effects, such as bisphenol A, musk compounds, triclosan and a number of pesticides currently in use. The sampling frequency for suspended matter was four times a year and for sediments twice a year.

The assessment of the monitoring results of the quality of constant matrix and their chemical status in 2011 was carried out in accordance with the Government Order No. 23/2011 Coll. It establishes, in accordance with the Directives 2000/60/EC and 2008/105/EC, the qualitative limits for the selected substances in sediments and suspended matter, the so-called environmental quality standards — they mean concentrations of pollutants or groups of pollutants in water, sediments or biota that must not be exceeded in order to protect human

health and the environment. According to this legal regulation, the assessment is carried out for occurrences of the selected priority substances and priority hazardous substances listed in Annex X of Directive 2000/60/EC - anthracene, atrazine, PBDE, cadmium, chloroalkanes C10-13, DEHP, fluoranthen, HCB, hexachlorobutadiene (HCBD), HCH, lead, mercury, nickel, 4-nonylphenol, 4-terc octylphenol, pentachlorobenzene, pentachlorophenol, the sum of five substances of the PAH group: (benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(ghi)perylene, indenol(1,2,3-c,d)pyrene), and simazine and tributyltin. The assessment was carried out according to exceedances or non-exceedances of the EQS values by the profile annual average concentrations of these substances. EQS values were taken over to the Czech normative from the European draft of the qualitative standards prepared in 2005. Currently, their credibility is being reviewed and probably some of the limits will be changed according to new scientific knowledge.

EQS were most often exceeded by PAH group substances - fluoranthene in all 32 monitored profiles, the sum of five substances of the PAH group in 17 profiles and anthracene in 14 profiles. As regards other organic substances, EQS were exceeded by concentrations of hexachlorobenzene (4 profiles) and tributyltin (5 profiles). As regards the contents of metals, taking into account natural concentrations - a global geogene background (Turekian, Wedepohl, 1961), the EQS were most often exceeded by concentrations of lead (II profiles), mercury (10 profiles), cadmium (5 profiles) and nickel (3 profiles). In all sub-catchment areas, some of the listed EQS were exceeded at least in one case. The highest number of indicators (7 of the total of 9 chemical substances) exceeded the EQS limit in subcatchment areas of the Ohre River and the lower Elbe (cadmium, lead, nickel, mercury and hexachlorobenzene, fluoranthene, tributyltin), the Lužická Nisa River (cadmium, lead, mercury, the sum of PAHs, fluoranthene, tributyltin) and the upper and the middle Elbe (lead, mercury, the suma of five substances of the PAH group, anthracene, fluoranthene, tributyltin). In the profiles in the catchment area of the upper Vltava River, the EQS are exceeded only by the contents of fluoranthene. Typical of catchment areas of the Morava River, the Dyje River and the upper Oder are more frequent exceedances of the EQS by PAH group substances.

Given the relatively small number of quality limits for constant matrix set by the Government Order No. 23/2011 Coll. while also taking into account the continuity of assessment in the past years, there was also used the assessment based on classification of measured values into load categories under the Guidance Document "Criteria for Soil and Groundwater Pollution" from 1996 in accordance with the Guidance Document of the Ministry of the Environment for the Contaminated Land Risk Assessment No. 9/2005. The exceedance of category B limit is assessed as increased pollution which may be of negative effect on human health and individual environmental compartments, the exceedance of category C limit represents pollution which may pose a significant risk to human health and other environmental compartments.

Based on the above mentioned Guidance Document from 1996 it can be stated that contents of the monitored substances in constant matrices, similarly to the preceding years, largely corresponded to the level of natural values or moderate pollution. Potential risk level was reached only locally for PAH group substances, arsenic, mercury, lead, nickel, zinc and DDT group substances in sedimentable suspended matter. In the category of increased pollution and risk posing pollution, for the above mentioned substances except for PAH mostly only their highest measured values occurred. In suspended matter, increased pollution and risk posing pollution (B, C categories) except for polyaromatic hydrocarbons indicated for nickel, zinc and lead



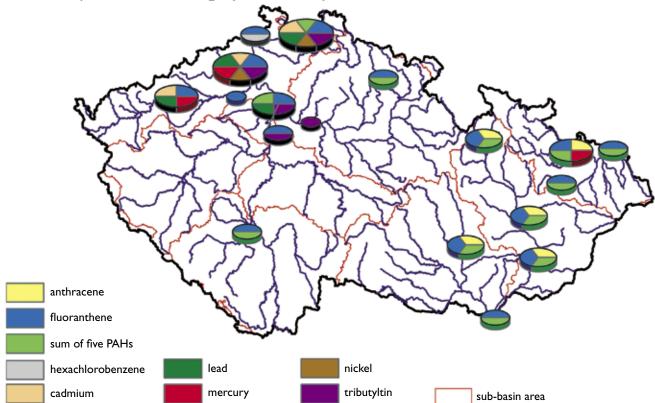
The Labe River in Týnec nad Labem

was detected solely in the Bílina River in Ústí nad Labem and in the Lužická Nisa River in Hrádek nad Nisou. In sediments, as regards heavy metals, arsenic in contents exceeding the limit was detected in all samples from the Bílina River in Záluží and from the Ohre River in Zelina and mercury in contents exceeding the limit was detected in the Bílina River in Ústí nad Labem. The limit for increased pollution and risk posing pollution was most often exceeded (in 15 of the total of 68 measured samples), similarly to the years 2009 and 2010, by some of the PAH group substances, namely benzo(a)pyrene, benzo(a)anthracene and benzo(b)fluoranthene. Their contents exceeding the limit were repeatedly detected in suspended matter, most frequently in the Oder River in Bohumín, the Olše River in Věřňovice (downstream of of the Ostrava-Karviná agglomeration), the Svitava River in Bílovice, the Morava River in Raškov, the Lužická Nisa River in Hrádek nad Nisou. In sediments, the limit for increased pollution by PAH was detected in both samples from the Oder River in Bohumín. In the majority of cases, the localities concerned show the contamination observed in the long run. Especially in suspended matter, the detected values of benzo(a)pyrene pollution document only insignificant differences between industrially polluted localities (the Ostrava area), suburban localities (Spytihněv) and localities with predominantly small local heating sources (Bílovice, Raškov).

Looking at the long-term trend in constant matrix pollution, a further reduction of contents of arsenic in suspended matter of the Bílina River in Ústí nad Labem was identified. A similar trend was shown by specific beryllium pollution, especially in the region upstream of the Nechranická reservoir the contents of beryllium in suspended matter showed a long-term excessive pollution load, and from 2010 a reduction of contents by up to 50% is monitored to have reached the category of slight pollution, which is a usual level of contamination of other major watercourses. As regards other metals, the status is more or less stabilized, contents of mercury in sediments of the Bílina River in Ústí nad Labem continue to show increased pollution. Repeatedly found contamination by metals on the Lužická Nisa River downstream of industrial zone of the Liberec area corresponds to a sustained pollution load - this locality in the long run has been showing higher contents of heavy metals with episodic findings of contents exceeding the limit. As regards PAH group substances, a slightly increasing trend in concentrations of benzo(a)pyrene in suspended matter can be observed since

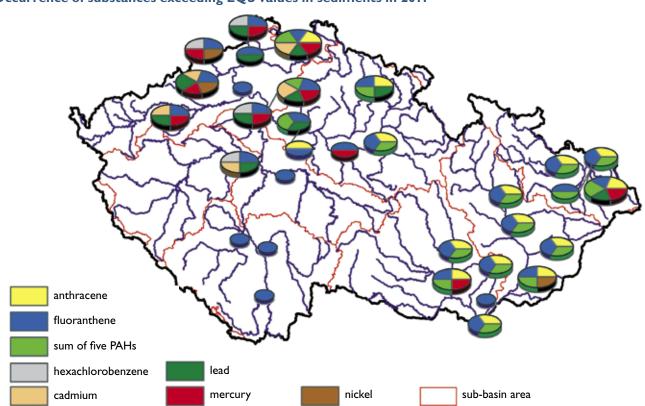
It is also necessary to mention the presence of hazardous substances that were not classified as exceeding the limit. These are especially organochlorinated pesticides from old contaminated sites — DDT group with sustained highest occurrences in sediments in the Bílina River and the lower Elbe downstream of Děčín. As regards other pesticides belonging to old contaminated sites, hexachlorobenzene again in the highest concentrations was detected in the Bílina River and the lower Elbe downstream of Děčín. Downstream of the Spolchemie

Figure 3.1.3
Occurrence of substances exceeding EQS values in suspended matter in 2011



Source: Czech Hydrometeorological Institute

Figure 3.1.4
Occurrence of substances exceeding EQS values in sediments in 2011



 $Source: \ Czech \ Hydrometeorological \ Institute$ 

plant, the average annual value of hexachlorobenzene content in sediments exceeded 30 times the EQS value, in the Elbe sediments downstream of Děčín even 150 times the EQS value.

As regards the currently used pesticides, bifenthrin exceeding the value of detection limit was found in the Morava River in Lanžhot, the Oder River in Bohumín (the highest concentrations reaching up to 400  $\mu g.kg^{-1}$ ) and the middle Elbe in Valy and Lysá nad Labem. Chloropyriphos was detected in the Morava River in Spytihněv, propyzamide in the Olše River in Věřňovice, alpha HCH in the Elbe in Obříství and downstream of Děčín. Other measured pesticides currently in use were in all cases below the detection limit. Overall, the pesticides in use were more frequently and in higher concentrations detected in suspended matter, compared to sediments.

Chlorobenzenes represent long-term typical pollution of the middle Elbe in the stretch downstream of Pardubice. Suspended matter samples from the Valy and Lysá profiles were not analyzed in 2011 for financial reasons. In the hydrometric profile of the Elbe catchment area in Obříství, suspended matter samples showed relatively low values, according to the MoE Guidance Document they reached max. the category of slight pollution. Chlorobenzenes in the Elbe sediments downstream of Pardubice and in Obříství were also detected in relatively low values. Significantly higher contents of especially 1,2,3-and 1,2,4-trichlorobenzene (100–2600 µg.kg<sup>-1</sup>) were measured in mixed samples of sedimentable suspended matter in the Valy profile.

The contents of PCB group substances were, similarly to the previous year, measured in relatively low values, according to the MoE Guidance Document in 75% of suspended matter samples they corresponded max. to slight pollution, the highest values were detected in suspended matter of the Lužická Nisa River in Hrádek nad Nisou, in the middle and lower Elbe and in the Bílina River in Ústí nad Labem. In sediments, PCB contents reached values higher on order, compared to suspended matter. In the largest amounts they accumulated in the Bílina River, in the lower Elbe downstream of Děčín, in the Ohře River, in the upper Elbe and in the Opava River in Děhylov.

As regards newly monitored priority substances listed in Annex II of the Directive 2008/I05/EC, the presence of DEHP was detected in suspended matter and sediments in all hydrometric profiles. The highest contents of DEHP occurred in the Bílina River in Ústí nad Labem and in the Lužická Nisa River in Hrádek nad Nisou (from 10 to 25 mg.kg-1). The EQS value was exceeded in none of the monitored hydrometric profiles. Also chloroalkanes C10-13 which are categorized in priority hazardous substances were detected in the majority of the monitored hydrometric profiles. Compared to sediments, suspended matter samples show up to 2 times higher contents. PBDE in the majority of suspended matter and sediment samples did not exceed the detection limit. The dominant congener, which was present in several times higher concentrations, was PBDE 209 (forming 97% of currently most often used commercial mixture in industry - decaBDE). It was detected in the highest concentrations in sediments and suspended matter of the middle Elbe (from 100 to 900 µg.kg-1). Tributyltin (cation) was measured only in suspended matter samples from 13 hydrometric profiles on major watercourses. The highest contents of tributyltin (15 µg.kg<sup>-1</sup>) were measured in the Elbe in Lysá nad Labem and in Obříství.

The priority substances also include 4-nonylphenol and 4-terc octylphenol from the alkylphenol group. In suspended matter, their presence exceeding the detection limit was not identified, in sediments only 4-terc octylphenol was identified in the Dřevnice River in Otrokovice. The EQS value was not exceede. Bisphenol A in suspended matter was identified in the majority of the monitored profiles, usually in amounts not exceeding 50 ug.kg<sup>-1</sup>. The highest contents were detected in sediments and suspended matter of the Bílina River in Ústí nad Labem (from 100 to 500 µg.kg<sup>-1</sup>). As regards other potentially hazardous substances, galaxolide and tonalide, i.e. substances belonging to the group of synthetic aromatic compounds were detected in all hydrometric profiles. Their highest contents (on order of hundreds µg.kg<sup>-1</sup>) occurred in the Bílina River, the Lužická Nisa River and in the Ohře River in Želina.

As regards the negative effects on the aquatic ecosystem and human health, persisting occurrence of high contents of metals, some organochlorinated pesticides from old contaminated sites



The Morava River in Veselí nad Moravou

and PAHs in watercourses in regions with a high concentration of industry and long-term anthropogenic load, i.e. in the Bílina River, the Ohře River, the Lužická Nisa River, the Oder River and in the Elbe border profile can be assessed as a status still requiring attention. In addition to classical pollutants, in a number of rivers there are demonstrably present also other not routinely monitored chemical substances with probable toxic and endocrine effects, whose presence and cumulation in the aquatic environment may represent in the future a potential risk to aquatic ecosystems. In terms of achieving good chemical status of waters, the most problematic appear to be exceedances of the EQS values in the contents of PAHs, hexachlorobenzene, cadmium, lead and mercury.

## Accumulation bio-monitoring of surface waters in the year 2011

In the year 2011, similarly to the preceding years, the contamination of biomass by harmful substances was monitored in 21 representative profiles of the main watercourse in the Czech Republic as a part of surface water surveillance monitoring. In connection with a reduction of financial resources for the year 2011, the following biotic matrices were not analyzed within the accumulation monitoring: zebra mussel Dreissena polymorpha (18 localities) and biofilm (21 localities). For fish matrix, namely Leuciscus cephalus (European chub - 15 localities), only mercury in fish muscle tissue, PFOS and PFOA in blood and biochemical parameters (markers) were monitored. Juvenile stages of fish - the fry (21 localities) were monitored for all indicators, similarly to the preceding years, as well as benthic organisms (Hydropsyche sp., Erpobdella sp., Gammarus sp. - 21 localities monitored).

The assessed pollutants are substances with very low solubility in water (in water samples they are mostly below detection limit) and they easily accumulate in fats. Among heavy metals the monitored pollutants are lead, cadmium, mercury, chromium, zinc, copper, nickel and arsenic, and among specific organic substances indicator PCB congeners (PCB-28. PCB-52. PCB-101. PCB-138. PCB-153. PCB-180), chlorinated pesticides (o,p and p,p DDT isomers and  $\alpha,\beta,\gamma,\delta,\text{-HCH}$  isomers), hexachlorobenzene, PBDE (congeners 28, 47, 99, 100, 153 and 154), polyaromatic hydrocarbons (PAH) — the sum of compounds: fluoranthene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, benzo(g,h,i)perylene, indenol(1,2,3-cd)pyrene), DEHP. Values are given in units per wet weight.

For biota, binding EQS values have not yet been defined, except for EQS formercury, hexachlorobenzene and hexachlorobutadiene (Directive of the European Parliament and the Council 2008/105/EC was transposed into the Czech legal regulations by the Government Order No. 23/2011 Coll.). The selected indicators were compared with the draft of EQS of 31 January 2012 (draft of Directive of the European Parliament and the Council, amending the Directive 2000/60/EC).

#### Polyaromatic hydrocarbons (PAH)

Polyaromatic hydrocarbons were evaluated in the fry. These are substances that are produced mainly during imperfect combustion. Many of these substances have mutagenic and carcinogenic effects. Fluoranthene values ranged from 0.7  $\mu g.kg^{-1}$  in the Berounka River profile in Srbsko to 8.0  $\mu g.kg^{-1}$  in the Bečva River in Troubky. In comparison with the proposed EQS (30  $\mu g.kg^{-1}$ ), fluoranthene values are significantly lower, unlike other indicator polyaromatic hydrocarbons, where approximately 25% of the monitored profiles show exceedances.

#### Perfluorooctane sulphonate acid (PFOS)

This acid belongs to the group of perfluorinated compounds (PFC) that are used in many industrial sectors (coolant mixtures, components of pharmaceuticals, lubricants, fire retarders, substances influencing the surface tension – protective coatings, etc.). They are persistent substances that have a strong ability to accumulate in the bodies of organisms. The measured concentrations in fish fry in about half of the monitored profiles exceeded the proposed EQS (9.1 µg.kg-1). The values range from 1.4 to 73 µg.kg-1 (the Elbe in Lysá nad Labem). High values were also measured in the Lužická Nisa River, the Morava River, the Jizera River, the Bečva River and the Bílina River. Much higher values were found in the blood of adult fish.

#### **Sum of DDT**

The concentrations were assessed in benthic organisms (indicator congeners o,p'and p,p'). High values (105.5  $\mu g.kg^{-1}$ ) were detected (similarly to the previous years) in the Bílina River profile in Ústí nad Labem. Most probably this is an old pollution load in sediments. In other profiles the values ranged between 4 and 26  $\mu g.kg^{-1}$ . The limit value for DDT has neither been established by the EC, nor by the Government Order.

#### Bis(2-ethylhexyl)phtalate (DEHP)

This substance is widely used mainly as a softening agent in plastics and is classified to belong to priority hazardous substances. Compared to the EQS (3200 µg.kg<sup>-1</sup> – Government Order No. 23/2011 Sb.), only one extremely high value (the Elbe in Obříství 56 000 µg.kg<sup>-1</sup>) significantly exceeding the above mentioned limit value was detected. In the draft of Directive of the European Parliament, limit value for DEHP is not proposed.

#### Brominated diphenylethers (PBDE)

These are substances that are persistent, insoluble in water and well soluble in organic solvents. They have the ability to accumulate in organisms and sediments. In fish fry and benthic organisms in all of the monitored profiles the measured values significantly exceeded the proposed EQS (0.0085  $\mu g.kg^{-1}$ ). It is worth mentioning that the EQS proposed by the European Commission is by up to three orders of magnitude lower than values obtained from the monitoring conducted by the Czech Hydrometeorological Institute.

#### Mercury

This indicator was evaluated in benthic organisms and in fish muscle tissue (European chub). Mercury concentrations exceeded the proposed limits in the Sázava River profile in Nespeky, in the Elbe profile in Děčín and in the Lužnice River profile in Bechyně. The maximum value was detected in the Vltava River profile in Zelčín.

#### Hexachlorobenzene (HCB)

This substance was monitored in fish fry and benthos. The maximum value was measured in the Bílina River in Ústí nad Labem in the fish fry matrix. Only in this case the valid EQS (20  $\mu g.kg^{-l}$ ) was exceeded, having reached the double of the EQS value. This is probably again an old pollution load from the chemical production, similarly to DDT.

#### Biomarkers

The monitored biomarkers in fish give us the important information on adverse effects of the aquatic system contamination on the organism of fish and significantly complement the chemical monitoring system. These indicators mostly do not react to a specific pollutant but indicate complex pollution and help assess to what extent the aquatic ecosystem is affected by anthropogenic pollution. One of important indicators is the concentration of vitellogenin (VTG) in blood

plasma showing pollution by xenoestrogenic substances affecting the reproduction system. VTG is a phospholipoprotein, which is synthesized in the liver of female fish. If the substances with an estrogenic effect are present in the aquatic environment, VTG synthesis also takes place in the liver of male fish, and this may lead even to degenerative changes in the genital organs of males as well as disorders of the endocrine system and the reproductive capacity of fish. The highest VTG values were detected in the Berounka River profile in Srbsko and in the Elbe profile in Obříství.

## Summary evaluation of accumulation bio-monitoring of surface waters

The results of bio-accumulation monitoring in 2011 clearly show that the aquatic ecosystem contains (often in high concentrations) pollutants, which in mere water samples cannot be detected. The monitoring of the pollutants in several matrices confirms the complex contamination of the aquatic environment and shows that values detected in one matrix only often may not provide sufficient information on the status of contamination of the aquatic ecosystem. Bio-accumulation monitoring has been carried out since the year 2000, and so far no significant decrease in values of the monitored substances in monitored organisms was observed. In addition, the negative reaction of fish to the contamination of the aquatic environment was confirmed.

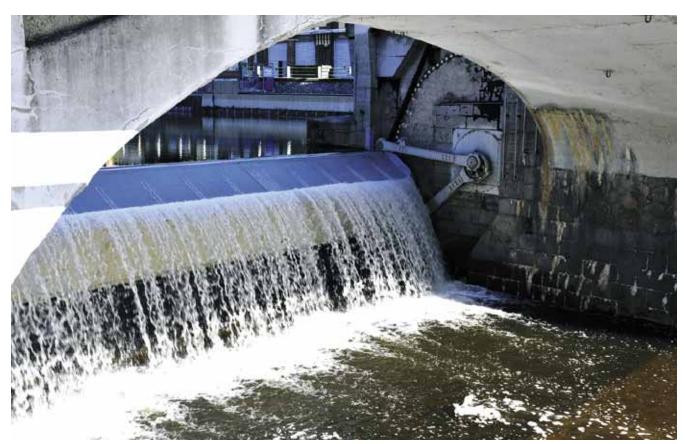
#### 3.2 Groundwater quality

In the year 2011 the national water quality monitoring network monitored 653 sites comprising 174 springs (the monitoring of springs documents natural drainage of groundwaters particularly in the Crystalline complex and local drainage of Cretaceous structures), 214 shallow wells (the wells are largely located in alluvial plains of the Elbe, Orlice, Jizera, Ohře, Dyje, Morava, Bečva, Oder and Opava Rivers – these groundwaters are highly vulnerable, with a high coefficient of filtration and rapid pace of pollution) and 265 deep wells (the wells

are concentrated mainly in the Bohemian Cretaceous Basin, the České Budějovice Basin and the Třeboň Basin and monitor the quality of deep aquifers – direct vulnerability of these waters is not very high, because the contamination there is manifested only after a longer period of time). In total, 213 indicators were measured. Due to money-saving measures, the national water quality monitoring network sites were sampled, compared to the previous years, with a frequency of only once a year, in spring time.

With regard to the requirements of the Directive 2000/60/EC, the evaluation of groundwater quality results in the year 2011 focused especially on hazardous substances. The measured values of the groundwater quality indicators were compared with the reference values for groundwater under Decree No. 5/2011 Coll., defining groundwater zones and groundwater bodies, the method of groundwater status assessment and the requirements of the programmes of groundwater status assessment. This decree establishes reference values of indicators as limits for the groundwater quality assessment. In contrast to the groundwater quality assessments from the previous years, the data for the year 2011 were compared neither with the limits for drinking water, nor the values of the A, B and C criteria under the Guidance Document issued by the Ministry of the Environment on 15 September 1996 - the Criteria for Soil and Groundwater Contamination.

In the year 2011, as regards inorganic ions, values exceeding the limit were most frequently found for manganese after filtration (38.3% of samples above the limit values), nitrates (12.1% of samples above the limit values), ammonia ions (10.4% of samples above the limit values), sulphates (3.5% of samples above the limit values), chlorides (2.8% of samples above the limit values) and fluorides (2.6% of samples above the limit values). Increased concentrations of inorganic substances are mostly shown by shallow wells, except for fluorides that are more frequently shown by springs and deep wells).



Weir in Hučák, the Labe River



The Skalická Morávka River

From the group of metals, most frequently failing to meet the limit is barium after filtration (48.2% of samples above the limit values), followed by arsenic after filtration (5.2% of samples above the limit values), aluminium after filtration (1.4% of samples above the limit values) and nickel after filtration (1.7% of samples above the limit values). For barium, increased concentrations are clearly higher in shallow aquifers, for other metals a clear dominance of values exceeding the limit in shallow or deep groundwater horizons cannot be stated.

Indicators showing the presence of organic substances above the limit values include chemical oxygen demand by permanganate (9.2% of samples above the limit values) and dissolved organic carbon (8.1% of samples above the limit). The presence of these substances, however, affects also concentrations of other toxicologically less significant indicators, such as humic substances (20.2% of samples above the detection limit). Increased values of these indicators are characteristic of shallow groundwater circulations.

As regards the numerous group of pesticide substances, the limit values for drinking water are most frequently exceeded by metabolites of herbicides alachlor, metholachlor and acetochlor (chloroacetanilides). These are alachlor ESA (9.8% of samples above the limit values), metholachlor ESA (6.1% of samples above the limit values), acetochlor ESA (4.9% of samples above the limit values), acetochlor OA (2.0% of samples above the limit values), metholachlor OA (2.6% of samples above the limit values) and alachlor OA (2.0% of samples above the limit values). In addition, less occurring

are triazin pesticides, especially herbicide atrazine and its metabolites, such as hydroxyatrazine (1.4% of samples above the limit values), desethylatrazine (1.7% of samples above the limit values), atrazine (1.5% of samples above the limit values). Also hexazinone (2.0% of samples above the limit values) and bentazone (1.4% of samples above the limit values) were found. Other pesticides showing concentrations above the limit values occur only sporadically. Groundwater samples with pesticide concentrations exceeding the limit values were most frequently collected from shallow wells. As regards polycyclic aromatic hydrocarbons, in terms of limits for groundwater, more significant occurrences are shown by phenantrene (11.0% of samples above the limit values) and chrysene (3.4% of samples above the limit values). As regards the group of volatile organic compounds, concentrations exceeding the limit values occur only sporadically, most markedly being shown by 1,2-cis dichloroethene (3.2% of samples above the limit values) and toluene (0.9% of samples above the limit values).

Radiochemical properties of groundwater were monitored using a single general indicator, the total volume activity alpha (7.8% of samples above the limit values).

Among inorganic indicators, more frequent occurrences of concentrations exceeding the limit values are shown by nutrients, namely nitrates and ammonia ions. Ammonia ions are closer bound to the particular areas, even particular river basins, on the other hand, nitrates are more evenly distributed in the map, thus indicating also areas with more intense agricultural activity.

While the occurrences of above-limit concentrations of organic substances from the group of polycyclic aromatic hydrocarbons and volatile organic compounds are scarce to sporadic, organic substances from the pesticides group occur much more frequently. Most frequently occurring are above mentioned metabolites of herbicides, namely alachlor, metholachlor and acetochlor. Pesticide substances, compared to other groups of pollution indicators, are not strictly bound to industrial areas, which corresponds with their use mainly in agriculture. A higher frequency of occurrence of pesticides demonstrates the quantity of applied herbicide preparations as well as their ability to accumulate in the environment.

Overall, it can be summarized that most significant indicators of groundwater pollution there appear nitrogenous substances (nitrates and ammonia ions), sulphates, metals (barium, arsenic, aluminium and nickel) and pesticides (chloroacetanilides and triazines). Exceedances of the limit values are rather observed in the groundwaters of shallow wells situated in alluvial plains of the rivers that are most affected by anthropogenic activity. The summary of the number of sites where exceedances of the limit values for groundwater were analytically found for at least one indicator is presented in table 3.2.1.

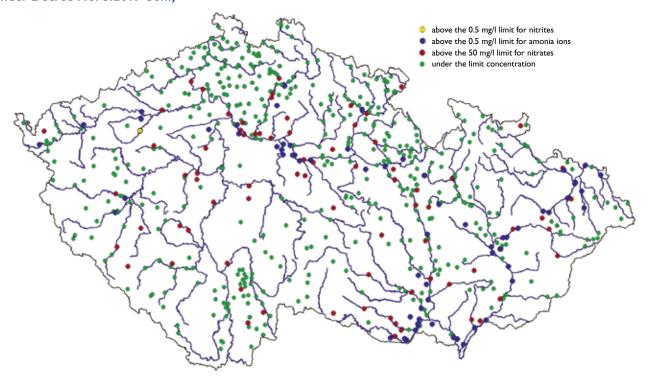
The table shows a slight improvement in the number of sites with exceedances of the limit values for groundwater, compared to 2010. The comparison with the values for the year 2010, however, is influenced by the fact that in 2010 the sampling was conducted twice a year (in spring and autumn) and the site with exceedance of the limit values was that one where the limit values were exceeded for at least one sample for at least one of the indicators. It has also to be noted that the evaluation this year is first based on the limits (reference values) for groundwaters under the MoE and MoA Decree No. 5/2011 Coll. Reference values established by this Decree are different for some indicators, compared to the limit values for drinking water under the Ministry of Health Decree No. 252/2004 Coll. For example, the reference value of 50 µg/l for barium is relatively low, because it corresponds to the background level in plain groundwaters. Another limit, which is exceeded for most of groundwater samples, is the reference value for manganese. The value of 0.05 mg/l is established also by the Decree for drinking water, however, due to the fear of affecting drinking water by undesirable organoleptic properties, not for toxicological reasons. Especially these two indicators, barium and manganese, most significantly contributed to the increased percentage of sites exceeding the limit values for groundwater.

Table 3.2.1
Summary of the number of sites where the B or C criteria values were exceeded at least in 1 indicator for the year 2011 (compared to 2010)

Sites	Number of sites	Number of sites with exceedances of limit values for groundwater	% of sites with exceedances of limit values for groundwater
Shallow wells	214	201	93.9 (96.3 in 2010)
Deep wells and springs	439	309	70.4 (80.4 in 2010)
All sites	653	510	78.1 (85.6 in 2010)

Source: Czech Hydrometeorological Institute

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



Source: Czech Hydrometeorological Institute



## 4. Water use

#### 4.1 Surface water abstractions

The Reports on water management in the Czech Republic in the past years stated that a year-to-year decrease in surface water abstractios rather ceased. The exception was the year 2009, in which, compared to 2008, a certain temporary decline of surface water abstractions occurred. The year 2011 again shows a decrease of the total abstractions in the amount of 1,513.8 million m³, compared to the amount of 1,573.4 million m³ in 2010.

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 compiling and on the water balance data. Pursuant to the provision in Section 10 of this Decree, the scope of reported data changed after 2001, so that now the registered abstractions (as well as waste water and mine water discharges) only include abstractions exceeding 6,000 m³ per year or 500 m³ per month. The source documents for retrieving the data are the reports submitted to the Czech Statistical Office by the respective river basin administrators before the deadline of 31 March of the following year. The data for the year 2011 were classified based on the NACE according to Eurostat (incomplete acronym of the French expression "Nomenclature statistique des activités économiques dans la Communauté européenne"). Before 2008, older classification according to the so-called SCEA (sector classification of economic activities by the Czech Statistical Office, Prague 1998) was used. Similarly to the preceding years, with a view to integrating the data provided by the individual River Boards, state enterprises, no water transfers and waters abstracted for fishpond systems were included in surface water abstractions. Table 4.1.1 shows detailed information on the NACE classification of surface water and groundwater abstractions based on user groups.

A more significant increase in the percentage of water abstractions (by 7.5%) was observed only in the sector of agriculture. In the year 2010, the total water abstractions in this sector amounted to 25.3 million m³, in 2011 to 27.2 million m³. Nevertheless, there further remains a question, whether the reported amounts correspond to the real situation in the individual sub-basins, such as Blšanka in the Ohře River Basin. This fact is associated with the provision of Section 101 of the Act No. 254/2001 Coll. (compensation for humidity deficit of agricultural crops — only a part of abstracted water is charged, nevertheless, for the purposes of Decree No. 431/2001 Coll., all abstracted water must be reported). An insignificant increase in water abstractions can be observed in the group of other users (including construction industry), namely by 2.3% (in the year

2010 the total water abstractions amounted to 8.8 million  $m^3$ , in 2011 to 9.0 million  $m^3$ ).

As regards surface water abstractions for public water supply networks, it can be stated that in 2011, compared to 2010, these abstractions decreased very markedly by 6.4% (a decrease from 349.0 million m³ to 326.6 million m³). As for industry (including extraction of mineral resources), in the year 2011 the abstractions, compared to 2010, again decreased from 250.8 million m³ to 241.6 million m³, i.e. by 3.7%.

As regards surface water abstractions registered by the individual River Boards, s. e., in 2011 an insignificant increase to 103.5% was recorded only in the Morava River Board, s. e., other River Boards, s. e., compared to the year 2010, showed a decrease, namely to 94.5% for the Elbe River Board, s. e., to 96.4% for the Vltava River Board, s. e., to 96.7% for the Ohře River Board, s. e., and to 95.7% for the Oder River Board, s. e.

As regards surface water abstractions for public water supply networks in 2011, all River Boards, s. e., compared to 2010, showed a decrease in abstractions as follows: the Elbe River Board, s. e. to 92.6%, the Vltava River Board, s. e. to 96.7%, the Ohře River Board, s. e. to 86.4%, the Oder River Board, s. e. to 95.5% and the Morava River Board, s. e. to 88.9%. As regards water abstractions for agriculture, an increase, compared to the year 2010, was reported especially by the Morava River Board, s. e., namely to 128.2%. Abstractions for the energy sector decreased most significantly in the Elbe River Board, s. e., to 94.1%, in the main, this only related to the Mělník power plant (with flow cooling, not circulation cooling). As regards water abstractions for industry (including extraction of mineral resources), rather a decrease or stagnation is reported by all River Boards, s. e.

The total charged abstractions significantly decreased from 1,515.4 million m<sup>3</sup> in the year 2010 to 1,463.1 million m<sup>3</sup> in 2011. The proportion of charged abstractions in 2011 amounted to 96.6% of the registered abstractions in total. The structure of the registered water abstractions in the respective river basins in 2011 is shown in table 4.1.2. The overall development of surface water abstractions since the year 1985 is shown in chart 4.1.1. After the year 1990 the improvement of price ratios in water services provided and also the change in the structure of industrial and agricultural production resulted in a significant decrease in water resources use in all water use areas. For example, we can see that surface water abstractions for public water supply networks decreased, compared to the year 1990, from 744.9 million m<sup>3</sup> to 326.6 million m<sup>3</sup>. Thus, the abstractions in the year 2011 amount only to 43.8% of the volume abstracted in 1990. The

Table 4.1.1

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

Classification of users in the marriada user groups according to the NACE classification							
Public water supply networks	NACE 36						
Agriculture (incl. irrigation)	NACE 01 – 03						
Energy sector (electricity and heat generation and distribution)	NACE 35						
Industry (incl. extraction of mineral resources – excl. energy sector)	NACE 05 – 34						
Other (incl. construction industry)	NACE 37 – 96						
Total (excl. fishponds and transfers)	NACE 01 – 96						
Public sewerage systems (excl. transfers)	NACE 37						

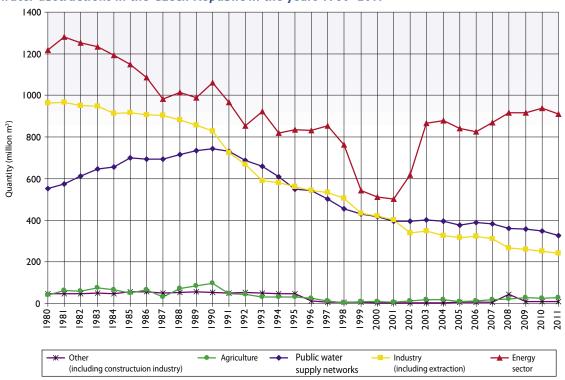
Source: Czech Statistical Office

Table 4.1.2
Surface water abstractions in the year 2011 exceeding 6,000 m<sup>3</sup>/year or 500 m<sup>3</sup>/month in millions of m<sup>3</sup>

River Board, state	Public water supply networks		Agriculture incl. irrigation		Energy sector		Industry incl. extraction		Other incl. construction industry		Total	
enterprise	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number
Elbe River Board, s. e.	37.8	32	6.2	49	647.2	12	90.8	77	1.5	52	783.5	222
VItava River Board, s. e.	141.2	44	0.6	12	56.1	17	34.2	74	6.3	41	238.4	188
Ohře River Board, s. e.	46.4	20	6.3	14	49.6	5	43.3	56	0.1	10	145.7	105
Oder River Board, s. e.	68.4	27	0.0	0	15.3	ı	61.3	56	0.5	34	145.5	118
Morava River Board, s. e.	32.8	34	14.1	38	141.2	2	12.0	84	0.6	30	200.7	188
Total	326.6	157	27.2	113	909.4	37	241.6	347	9.0	167	1,513.8	821

Source: MoA, River Boards, s. e., T. G. Masaryk Water Management Research Institute-public research institution

Chart 4.1.1
Surface water abstractions in the Czech Republic in the years 1980–2011



Source: MoA, River Boards, s. e., T. G. Masaryk Water Management Research Institute-public research institution

most significant decrease occurred in the industrial sector, from 830.1 million m³ in the year 1990 to 241.6 million m³ in the year 2011, i.e. to no more than 29.1% of the volume abstracted in 1990. Similarly, a significant decrease can be seen in agriculture, where the abstractions decreased from 92.2 million m³ to 27.2 million m³, i.e. to no more than 29.5% of the volume abstracted in 1990. This fact, however, does not mean that water resources would be less exposed to anthropogenic impacts. On the contrary, in the energy sector, for example, there was an increase in consumptive water use (the difference between abstraction and discharge, caused primarily by evaporation in the cooling towers of thermal and

nuclear power plants) from 118.7 million m<sup>3</sup> in the year 1990 to 140.5 million m<sup>3</sup> in the year 2011.

Every year the impacts on water resources are regularly evaluated within the water balance, compiled under Decree No. 431/2001 Coll., on the content of water balance, the method of its compilation and the water balance data. The principle of water management evaluation through water balance is the aggregated evaluation of the requirements for maintaining the minimum discharge with the respective flow rates in control profiles. These flows involve all water management activities.

#### 4.2 Groundwater abstractions

The total volume of abstracted groundwater remained, compared to the year 2010, in principle, at the same level (an increase by 0.4%). This fact shows that the decrease rate in this abstraction category reached its maximum during the previous periods – at present the abstractions tend to stagnate.

A certain change in the development trends showing a steady decrease occurred already in the year 2006. As regards groundwater abstractions for public water supply networks, it can be stated that compared to the year 2010 there was stagnation in the year 2011 (an insignificant decrease from 313.7 million m³ to 311.3 million m³, i.e. by 0.8%). The pattern of registered water abstractions in the respective river basins in the year 2011 is shown in table 4.2.1. In the year 2011, in total 4,235 groundwater abstractions, amounting to 379.0 million m³ were registered (this figure includes only abstractions exceeding 6,000 m³ per year or 500 m³ per month). As regards industry (including extraction

of mineral resources), in the year 2011 the abstractions increased, compared to the year 2010, from 31.5 million m³ to 34.9 million m³, i.e. by 10.8%. In agriculture, compared to the year 2010, the abstractions insignificantly increased from 11.5 million m³ to 11.7 million m³, i.e. only by 1.7%. The energy sector shows a stagnation (2.7 million m³ in the year 2010 and 2.6 million m³ in the year 2011).

In the individual river basins the highest percentage of the total groundwater abstractions was recorded in the river basins administered by the Morava River Board, s. e. (33.6%); the lowest percentage of groundwater abstractions was recorded in the river basins administered by the Oder River Board, s. e. (5.4%).

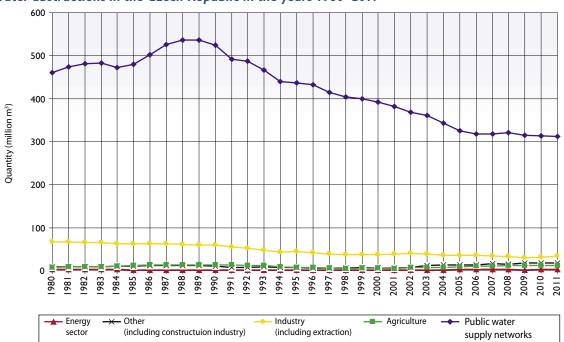
Looking at the territorial pattern, the registered groundwater abstractions in total decreased in the following river basins administered by: the Elbe River Board, s. e. (by 1.2%) and the Oder River Board, s. e. (by 0.5%). A slight increase was recorded by the Vltava River Board, s. e. (by 1.6%), the Ohře River Board, s. e. (by 2.2%) and the Morava River Board, s. e. (by 0.6%).

Table 4.2.1
Groundwater abstractions in the year 2011 exceeding 6,000 m<sup>3</sup>/year or 500 m<sup>3</sup>/month in millions of m<sup>3</sup>

River Board, s. e.	Public water supply systems		Agriculture incl. irrigation		Energy sector		Industry incl. extraction		Other incl. construction industry		Total	
	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number
Elbe River Board, s. e.	98.6	668	2.2	158	1.1	8	7.3	124	3.4	61	112.6	1,019
Vltava River Board, s. e.	33.3	572	4.1	287	0.4	12	9.7	131	9.4	340	56.9	1,342
Ohře River Board, s. e.	49.3	318	0.6	22	1.0	I	8.9	111	1.9	16	61.7	468
Oder River Board, s. e.	18.9	136	0.4	26	0.0	0	0.9	31	0.4	21	20.6	214
Morava River Board, s. e.	111.2	673	4.4	276	0.1	I	8.1	167	3.4	75	127.2	1,192
Total	311.3	2,367	11.7	769	2.6	22	34.9	564	18.5	513	379.0	4,235

Source: MoA, River Boards, s. e., T. G. Masaryk Water Management Research Institute – public research institution

Chart 4.2.I
Groundwater abstractions in the Czech Republic in the years 1980–2011



#### 4.3 Waste water discharges

In the year 2011, in total 1,975.0 million m³ of waste waters and mine waters were discharged into surface waters. Compared to the year 2010, this represented a decrease by 7.8%. It is however important to note that the compared year 2010 can be described as to have shown a rather extreme precipitation (not negligible part of waste waters is accounted for by so-called precipitation water). Similarly to the preceding years, with regard to the integration of data provided by the individual River Boards, state enterprises, these water discharges did not include waters discharged from fishpond systems.

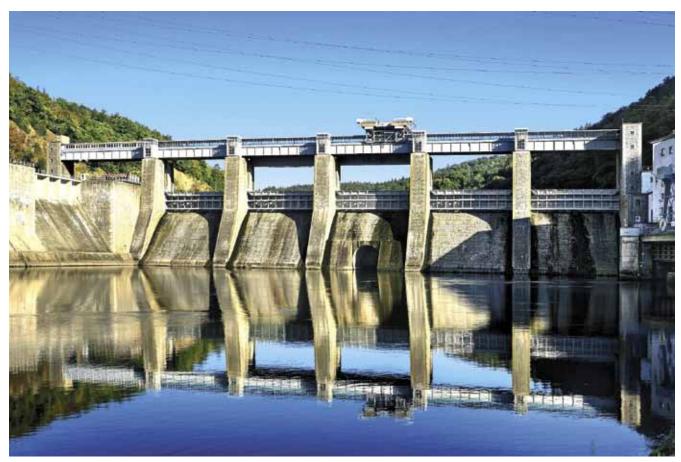
Evaluation of the quantity and quality of discharged waste waters until the year 2001 was based on the data reported by water users under Directive No. 7/1977 of Official Journal issued by the former Ministry of Forestry and Water Management, on registration and evaluation of the balance of the resources and the quality of surface waters and groundwaters. Since 2002 this evaluation has been carried out under Decree No. 431/2001 Coll., on the content of water balance, the method of its compilation and on data for water balance. Pursuant to the provision in Section 10 of this Decree, the scope of reported data changed so that now the registered abstractions (as well as waste water and mine water discharges) include abstractions exceeding 6,000 m³ per year or 500 m³ per month. This resulted in an increased number of the registered entities. This data, which is reported and registered every year, includes information on the quantity of waste waters, including waters specified pursuant to the provision in Section 4 of the Act No. 254/2001 (Water Act), which were originally called special waters. These waters were pursuant to Section 2 of the Act No. 138/1973 Coll. (in force until 31 December 2001) mine waters and mineral waters. The obligation to report the above data related only to such



The Osoblaha River

cases where the discharged water quantity exceeded 15,000 m<sup>3</sup> per year. Since the year 2003, the data on the quantity of waste waters discharged into surface waters has been taken only from the statistics of the Czech Statistical Office.

The largest percentual decrease in the quantity of discharge waste waters compared to the year 2010 was observed in the category of public sewerage systems (by 10.9%). An unusual change in the quantity of these discharged waters relates mainly to the fact that the previous year 2010 can be described as to have shown above-average precipitation (see chapter 1). A decrease



Hydraulic structure Štěchovice

was also recorded in the energy sector and industry (including extraction of mineral resources), by 4.4% and 8.9%, respectively. An insignificant increase was recorded in the category "other" (including construction industry), by 6.6%.

It is evident that compared to the year 2010 the annual quantity of discharged waste waters slightly decreased but, with regard to a necessary correction (which needs to be taken into account, considering extreme rainfalls in 2010), it can be stated that the annual quantity of discharged waste waters continued to stagnate in the year 2011, or followed similar trends from the preceding years.

The users were classified in the respective groups according to the valid sectoral NACE classification (see table 4.1.1).



The Ostravice River in Frýdek-Místek

Table 4.3.1

Discharges of waste waters and mine waters into surface waters from sources exceeding 6,000 m³/year or 500 m³/
month in the year 2011 in millions of m³

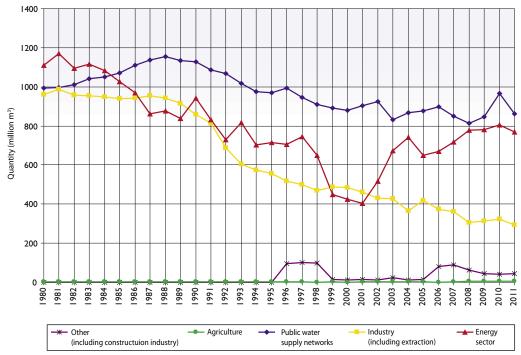
River Board, s. e.	Public water supply systems		Agriculture incl. irrigation		Energy sector		Industry incl. extraction		Other incl. construction industry		Total	
	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number	Volume	Number
Elbe River Board, s. e.	185.3	605	0.0	3	613.4	21	84.4	175	5.0	56	888.1	891
Vltava River Board, s. e.	279.7	645	0.7	4	18.5	24	41.5	144	28.7	536	369.1	1,418
Ohře River Board, s. e.	79.7	277	6.0	2	23.7	23	83.4	169	3.4	22	196.2	499
Oder River Board, s. e.	110.0	330	0.0	0	6.6	12	64.3	83	5.9	48	186.8	497
Morava River Board, s. e.	205.8	1,036	0.2	6	106.7	14	19.8	129	2.3	51	334.8	1,272
Total	860.5	2,893	6.9	15	768.9	94	293.4	700	45.3	713	1,975.0	4,577

Source: MoA, River Boards, s. e., T. G. Masaryk Water Management Research Institute — public research institution

Note: Explanations relating to the items agriculture (incl. irrigation, excl. fish breeding), energy sector (incl. extraction of mineral resources), industry (excl. energy sector and water supply systems) and to the item other (incl. construction industry) are presented in chapter 4.1.

Chart 4.3.1

Discharges of waste waters in the Czech Republic in the years 1980–2011





**Jan Lopour – 7 years** Palachova primary school, Žďár nad Sázavou, kraj Vysočina region

## 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.

Produced pollution means the quantity of contamination contained in produced (untreated) waste waters. In the context of the EU and OECD requirements, increased attention in the Czech Republic in the recent years has been paid to the collection of the data and the analyses of the produced pollution development. In the first place the extended scope of the measured data collection from a larger number of entities is being ensured within the framework of the so-called water management balance, in line with the requirements set by Decree No. 431/2001 Coll., on the content of water balance, the method of its compilation and on data for the water balance.

Production of pollution in the year 2011, compared to the year 2010, did not change significantly, in organic pollution having reached the following figures:  $BOD_5$  indicator decreased by 6,382 tonnes (by 2.6%), the  $COD_{Cr}$  indicator decreased by 9,935 tonnes (by 1.7%), the SS indicator decreased by 2,475 tonnes (by 0.9%) and the DIS indicator decreased by 53,403 tonnes (by 6.0%). The DIS indicator is so significantly lower rather due to the lower percentage of values for the year 2011 reported by individual entities obliged to do so (Section II of Decree No. 431/2001 Coll.)

Discharged pollution is the contamination contained in waste waters discharged to surface waters. Compared to the year 2010, the discharged pollution decreased in the year 2011 by 444 tonnes (by 6.1%) in the  $\mathrm{BOD}_5$  indicator, by 3,349 tonnes (by 7.3%) in the  $\mathrm{COD}_{\mathrm{Cr}}$  indicator, by 2,155 tonnes (by 15.3%) in the SS indicator and by 37,352 tonnes (by 4.3%) in the DIS indicator. The decrease was observed for all of the data reported by the individual River Boards, state enterprises. A significant decrease was also recorded for the SS indicator reported by the Elbe River Board, s. e. (by 21.8%) and the Oder River Board, s. e. (by 36.2%). A decrease in the DIS indicator was recorded by all River Boards,



Waste water treatment plant in Břeclav

s. e., only an insignificant increase (by 3.2%) was recorded by the Ohře River Board, s. e. Decreased N<sub>inorganic</sub> indicator was reported by all River Boards, s. e., except for the Vltava River Board, s. e. Most significant decrease (by 34.6%) was reported by the Elbe River Board, s. e. This is due to the fact that in 2009 there were completed measures to eliminate the discharged pollution in N indicator at the most significant pollution source in the Elbe river basin in the company Synthesia, a. s., and also at waste water treatment plants in Nový Bydžov, Nové Město nad Metují, Police nad Metují, Vysoké Mýto. A further significant decrease in pollution was contributed to by a termination of waste water discharges from the sludge settling lagoon of the Mělník power plant in Horní Počaply. Not a negligible effect was also a decrease in the total amount of discharged waste waters, compared to the year 2010. The development since the year 1990 in the discharged pollution and the pollution on which charges are imposed is shown in chart 5.1.1.

Table 5.1.1

Produced and discharged bollution in the year 2011

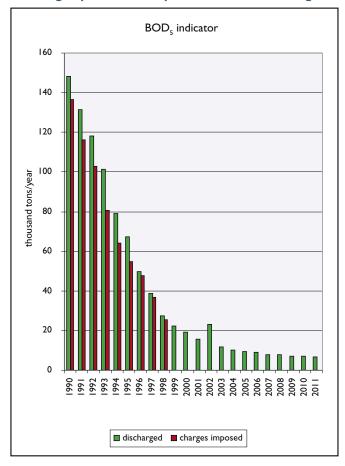
River	Produced pollution in tonnes/year							Discharged pollution in tonnes/year					
Board s. e.	BOD <sub>5</sub>	COD <sub>cr</sub>	SS	DIS*)	N <sub>inorg</sub>	P <sub>total</sub>	BOD₅	COD <sub>Cr</sub>	SS	DIS	N <sub>inorg</sub>	P <sub>total</sub>	
Elbe River Board, s. e.	45,489	118,067	51,935	210,980	6,807	1,055	1,701	10,858	2,975	202,255	3,000	283	
Vltava River Board, s. e.	85,072	194,907	93,088	155,864*)	9,075	2,076	2,230	12,609	3,222	165,278	4,200	321	
Ohře River Board, s. e.	15,591	53,419	19,107	126,717	1,949	636	505	4,251	1,714	127,822	1,083	212	
Oder River Board, s. e.	37,993	77,665	33,598	218,528	3,888	647	881	7,076	2,072	218,528	1,301	132	
Morava River Board, s. e.	59,220	137,672	69,285	117,275	6,091	1,461	1,472	7,885	1,916	116,247	2,186	242	

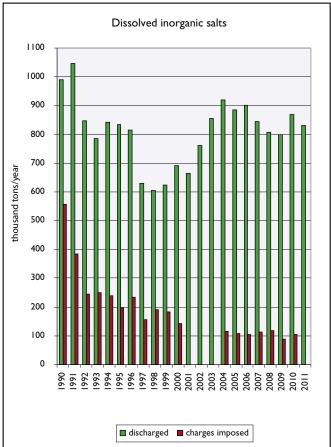
Source: T.G.Masaryk Water Research Institute – public research institution, from the source documents of the Czech Statistical Office and the River Boards, s. e.

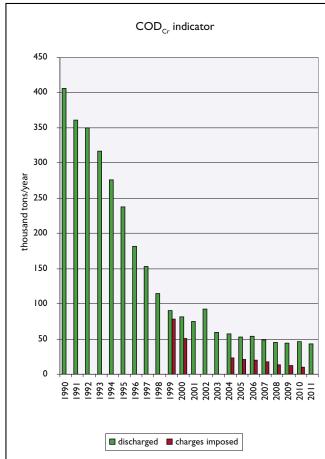
Note: ") The quantity of produced and discharged pollution should be approximately identical (by common waste water treatment methods the concentration of DIS cannot be reduced). With regard to the reporting discipline, lower completeness of the data for produced than discharged pollution can often be observed.

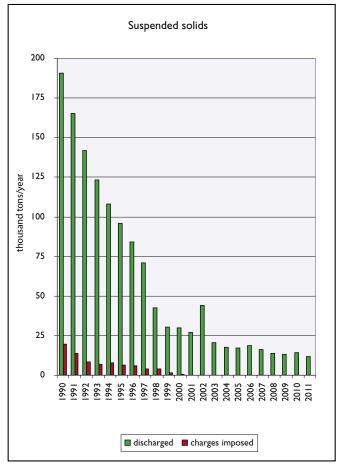
Chart 5.1.1

Discharged pollution and pollution on which charges were imposed in the years 1990–2011









Source: T.G.Masaryk Water Research Institute – public research institution, from the source documents of the Czech Statistical Office and the River Boards, s. e.

Between the years 1990 and 2011 the discharged pollution decreased in the  $BOD_s$  indicator by 95.4%, in the  $COD_{cr}$  indicator by 89.5%, in the SS indicator by 93.8% and in the DIS indicator by 16.1%.

In the 1990–2011 period, the water management sector succeeded also in reducing the quantity of the discharged hazardous and especially hazardous harmful substances. A significant decrease was also observed for macronutrients (nitrogen, phosphorus) as a result of the fact that waste water treatment technologies in the new and the so-called intensified waste water treatment plants apply the focused use of biological removal of nitrogen and biological or chemical removal of phosphorus.

#### 5.2 Area pollution

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

The main measures aimed at reducing area pollution of waters from agricultural sources include the Government Order No. 103/2003 Coll., on delimitation of vulnerable areas, the use and storage of fertilizers and manure, crop rotation and carrying out anti-erosion measures in these areas, as amended. This government order defines the "vulnerable areas" and declares an action programme.

The action programme can be characterized as a set of measures in vulnerable areas to reduce water pollution caused by nitrates and prevent further contamination of water. The main measures of this action programme include imposing the ban on the use of mineral nitrogenous fertilizers and fertilizers with rapidly releaseable nitrogen in winter period in dependence on the crop/culture and climatic region (Section 6), crop rotation and carrying out soil erosion control measures and the determination of the total amount of nitrogen of organic origin applied in farming land within one agricultural company. In addition, the measures include a construction of storage facilities for manure, which must meet their six-month production storage needs. The effectiveness of the action programme is regularly evaluated in a four-year period on the basis of the monitoring and evaluation of the preceding action programme efficiency.

The monitoring includes:

- a survey of whether the action programme requirements in farming companies in vulnerable areas are fulfilled,
- evaluation of the field investigation in farming companies in vulnerable areas,
- evaluation of the development of soil nitrogen content with regard to the respective arable crops and the farming equipment used, including modelling the transport of nitrogen in soil and water during the next period,
- monitoring of the development in farming methods in vulnerable areas.

Pursuant to Section 33, Subsection 2 of the Water Act, the Ministry of the Environment of the Czech Republic was obliged to carry out, according to the Government Order No. 103/2003 Coll., a review of vulnerable areas no later than four years from coming into force of this Govenment Order, i.e. by I September 2011 (revisions of vulnerable areas were

carried out as of 31 March 2011). A review of the delimitation of vulnerable areas, based on Section 3 of the Government Order, is carried out by the T. G. Masaryk Water Management Research Institute, public research institution, authorized by the Ministry of the Environment. The first reviewed delimitation of vulnerable areas was declared by the Government Order No. 219/2007 Coll. At present, it was decided to no longer implement only a new amendment to this Government Order; there will be released an entirely new (complete) legal regulation (currently under the process of approval). This new Government Order will also include the 3rd action programme (it was already sent to the EU for comments).

#### 5.3 Accidental pollution

Surface water and groundwater quality is also affected by the adverse impacts of accidental pollution. In the year 2011 the Czech Environmental Inspectorate registered in total 107 events of accidental releases into surface waters and 4 releases into groundwaters.

Pursuant to Act No. 254/2001 Coll., the Czech Environmental Inspectorate keeps central records of accidents since 2002. In 2003, the Czech Environmental Inspectorate started to cooperate with the Fire Rescue Department, especially in the transfer of information on accidents. In the year 2011, the Czech Environmental Inspectorate registered in total 181 accidents which met the definition of accident under Section 40 of the Act No. 254/2001 Coll. Not all of the reported accidents were accidents within the meaning of the Act, nevertheless, many of them were investigated. In the year 2011, a significant increase in the number of accidents (by 19 registered accidents) caused in traffic was observed. In total 27 accidents were accompanied by fish kill, which is by II accidents more, compared to the year 2010. The cause (inflictor) of the accident was known in 120 events, which represents 66% of the total number of the registered accidents. In 70 cases, the Czech Environmental Inspectorate investigated the accident or directly participated in the investigation.

The most numerous group of pollutants were oil and oil products: 56.4% of the total number of the registered events, followed by waste waters (10.5%) and chemical substances excl. heavy metals (6.6%). The character of the pollutants was not identified for 14 accidents (10.5%).

Classified by the cause (inflictor) of the accident, the most numerous were accidents caused in traffic (19.3%), followed by accidents associated with waste water and solid waste disposal (5.5%), accidents in agriculture, in hunting and game management and related activities (4.4%) and accidents caused by other inflictors (11.0%). The inflictor was not identified in 45.3% of all events. In 2011, the Czech Environmental Inspectorate imposed in total 408 penalties, of which 353 penalties became fully effective and amounted in total sum to CZK 16,622 million.



The Bílina River in Mezihoří



Hana Orcígrová – I I years Elementary School of Arts, Rokycany, Plzeňský kraj region

## 6. Watercourse administration

# 6.1 Professional administration of watercourses

The inland position of the Czech Republic in the heart of Central Europe predetermines its relation to the European river network and from the hydrological viewpoint it may be called "the roof of Europe". The basic hydrographic system according to maps on a scale of 1:10 000 is constituted by approx. 108,500 km of watercourses (with both natural and regulated stream channels). Watercourses on the territory of the Czech Republic are divided into two categories: significant watercourses and minor watercourses. In the year 2011, the professional administration of watercourses was carried out in accordance with the provisions of Section 47 of the Act No. 254/2001 Coll., on Water and on amendment to certain laws (the "Water Act"), as amended.

The main watercourse administrators are the River Boards, state enterprises and Forests of the Czech Republic, state enterprise, who report directly to the Ministry of Agriculture. From I January 2011, they are also responsible for the administration of minor watercourses transferred from the Agricultural Water Management Administration. Administration of minor watercourses was transferred to the respective River Boards, state enterprises according to the territorial scope and to the Forests of the Czech Republic according to the forest coverage criteria. State-owned River Boards, s. e. and Forests of the Czech Republic are responsible for the administration of about 91.7% of the total length of watercourses in the Czech Republic. Other entities involved, including the Ministry of Defence, the National Park Administrations and other natural and legal persons are responsible for approximately 5.6% of watercourse administration.

Professional watercourse administration broken down to the individual watercourse administrators is shown in table 6.1.1.

The specific account of significant watercourses is published in Decree No. 470/2001 Coll., stipulating the list of significant watercourses and the method of carrying out the activities relating to watercourse administration, as amended by Decree No. 267/2005, which came into force as of I July 2005. At present, a preparation of amendment to this Decree is under way. It provides an overview of 814 watercourses included in the "List of significant watercourses", which forms Annex I to the above mentioned Decree. This list also includes the identifiers of significant watercourses (Central Register of Watercourses). The significant watercourses, with a total length of 15,538 km, are administered under the provision in Section 4 of Act No. 305/2000 Coll., on river basins, by the respective River Boards, state enterprises: the Elbe River Board, the Morava River Board, the Oder River Board, the Ohře River Board and the VItava River Board. The backbone watercourses are the Elbe (370 km) with the Vltava River (433 km) in Bohemia, the Morava River (272 km) with the Dyje River (306 km) in South Moravia, and the Oder River (135 km) with the Opava River (131 km), in North Moravia and Silesia.

All the other watercourses (provision of Section 43 of the Water Act) are in the category of minor watercourses. The total length of minor watercourses drawn in maps on a scale of 1:10 000 is 91,717 km. The administration of minor watercourses is carried out under the provision of Section 48 of the Water Act, based on the respective appointment by the Ministry of Agriculture (the provision of Section 48, subsection 2 of the Water Act). If no administrator of a minor watercourse is appointed, the watercourse in question is managed by the administrator of the receiving watercourse where the outfall of the minor watercourse is situated. It does so until the administration of the watercourse is established under Section 48, subsection 2 of the Water Act. The administration of minor watercourses may be carried out by the municipalities through the territory of

Table 6.1.1
Professional watercourse administration

C-4	A Junioritation of the second	Length of watercourses in km				
Category	Administrator	2010	2011			
	Elbe River Board, s. e.	3,560.1	3,691.8			
	VItava River Board, s. e.	4,761.1	4,961.7			
	Ohře River Board, s. e.	2,290.8	2,977.3			
Significant watercourses 1)	Oder River Board, s. e.	1,111.4	1,360.0			
	Morava River Board, s. e.	3,814.6	3,847.6			
	Total	15,538.0	16,838.4			
	Agricultural Water Management Administration	46,091.0				
	Forests of the Czech Republic, s. e.	24,793.0	39,148.5			
Minor watercourses	River Boards, s. e. in total	11,337.0	43,506.0			
	Other administrators 2)	7,388.0	6,034.6			
	Other 3)	9,303.0	3,027.8			
	Total	98,912.0	91,716.9			
Watercourses in total		114,450.0	108,555.4			

Source: MoA

Note: <sup>1)</sup> A change in the length of significant watercourses was not caused by amendment to Decree No. 470/2001 Coll., but by reaching a higher accuracy of the length of watercourses in converting their length from maps on different scales.

<sup>2)</sup> Including National Park Administrations, the Ministry of Defence (authorities of military districts), municipalities and other natural and legal persons (e.g. mining combanies)

<sup>&</sup>lt;sup>3)</sup> These are minor watercourses that spring on the territory of the Czech Republic and flow abroad. So far, the administrator for these watercourses was not designated and Section 48, subsection 4 of the Water Act cannot be applied to these watercourses (in 2010, in addition, also the main drainage facilities were included).

which the minor watercourses flow, by natural or legal persons or, as the case may be, by the state organisational units using these minor watercourses or carrying out activities with which these watercourses are connected. The form and the content of the application for establishment of the administration of a certain minor watercourse is published and specified in detail in the above mentioned Decree No. 470/2001 Coll.

The public administration bodies and the general public find detailed information on the establishment of the administration of the respective watercourse in the "Register of Watercourses", which is available on the water management portal called WATER INFORMATION SYSTEM in the Czech Republic, i.e. www.voda. gov.cz. Currently, the produced register on a scale of 1:10 000 is presented.

The acquisition value of the non-current tangible assets relating to watercourses amounted in the year 2011 to CZK 50.12 million. Compared to the previous period, this value shows a year-on-year growth of CZK 0.25 billion.

The year-on-year growth is mainly caused by the increase in the non-current tangible assets generated by the renewal and planned development of entrusted property in the form of routine capital investment construction and by consecutive entries of the assets taken over, and the completed hydraulic structures in the accounting records. In the year 2011, under the Agreement on the gratuitous transfer of competence to manage the assets, rights and liabilities and on their acceptance to the right to perform management, water management assets and other assets associated with the transfer of administration of minor watercourses were transferred from the Agricultural Water Management Administration to state-owned River Boards, s. e. and the Forests of the Czech Republic. The total amount of the acquisition value of the non-current tangible assets, however, did not change significantly. The non-current tangible asset values in purchase prices and the year-on-year development (increase in the non-current tangible assets) for the individual watercourse administrators are shown in table 6.1.2.

Table 6.1.2

Acquisition value of non-current tangible assets relating to watercourses in billions of CZK

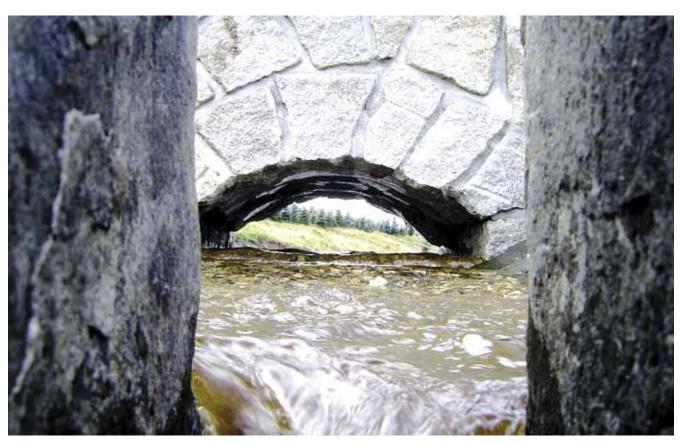
Watercourse administrators directly responsible to the Ministry of Agriculture	2010	2011
Elbe River Board, s. e.	8.59	10.10
Vltava River Board, s. e.	7.86	10.87
Ohře River Board, s. e.	8.56	9.50
Oder River Board, s. e.	5.13	5.91
Morava River Board, s. e.	6.94	8.39
River Boards, s. e. in total	37.08	44.77
Agricultural Water Management Administration	9.82	0.15
Forests of the Czech Republic, s. e.	2.97	5.20
Total	49.87	50.12

Source: MoA

Auditing activities in the individual River Boards, state enterprises, are carried out by the respective controlling bodies. The following comprehensive and selective audits were carried out in the year 2011.

#### Ministry of Agriculture

Similarly to the preceding years, the Ministry of Agriculture mainly carried out ongoing public inspections focusing on fulfilment of conditions, on the use of public funds and on economy of the respective enterprise in connection with the transfer of assets of the Agricultural Water Management Administration. In total 17 audits were carried out in 2011, at least two for every River Board, s. e. The majority of audits were carried out by the Department of Water Management Policy and Flood Control Measures, the Department of Water in Landscape and Rehabilitation of Flood



The Fláje stream

Damage and by the Establishment Policy Department. During the audits no major irregularities were identified, and it was established that the state budget funds were used in compliance with all regulations. During one audit only a recommendation was given concerning further steps to be taken in economy of the River Boards, s. e. One of the audits resulted in four findings that were supplemented by recommending proposals to rectify them. Another audit found the material performance not to comply to the contract, which was due to unfinished project taken over within the transformation of the Agricultural Water Management Administration. The remaining audits showed no major shortcomings and it was established that the state budget funds were used in compliance with all regulations.

#### **Financial Authorities**

In the year 2011 these state administration bodies carried out in total 6 financial audits in the Vltava River Board, the Oder River Board, the Elbe River Board and the Ohře River Board state enterprises, focused on inspecting the legitimacy of the use of subsidies and the observance of budget rules and budgetary discipline. One audit in the Elbe River Board, state enterprise has not been finished yet, and during one audit in the Oder River Board, s. e. the auditing body was not able to assess the correctness of the procedure. The remaining audits showed no shortcomings.

#### Health Insurance Company

The obligation of the employer in the field of health insurance payments and adherence to other obligations of insurance payer was audited in the Elbe River Board, the Vltava River Board, the Morava River Board and the Oder River Board, state enterprises. In total seven audits were carried out. One of the audits found a breach of notification obligation, everything was corrected, but the final protocol has yet not been signed.

#### The Czech Social Security Administration

In the year 2011 the district branch and the municipal branch of this institution carried out in total five audits in the Morava River Board, the Elbe River Board, and the Vltava River Board state enterprises, focused on social security contributions, sickness insurance and fulfilment of tasks regarding pensions. The audits showed no major shortcomings.

### The Occupational Health and Safety Inspectorate

The Occupational Health and Safety Inspectorate carried out one audit at the VItava River Board, s. e. and one audit at the Morava River Board, s. e. During the audit focused on the observance of occupational health and safety regulations at the Morava River Board, s. e., five negative findings were identified and a penalty imposed, which was subsequently paid. The latter audit found no shortcomings.

### Audits carried out by other state administration bodies

The Vltava River Board, state enterprise was subjected to audits that were carried out by the Regional Public Health Office, by the Fire Rescue Department of the Středočeský kraj region and by the Board of Customs Prague 5. The audits found no shortcomings. The Oder River Board, state enterprise was subjected to two audits that were carried out by the town-council of the Statutory City of Ostrava and by the municipal council of Ostrava in respect of a preliminary check on the investment project eligibility. No shortcomings were found and no corrective measures were imposed. The inspection connected with the transfer of assets and employees from the Agricultural Water Management Administration to the Oder River Board, s. e. was carried out by Grant Thorton. No shortcomings were found. The Regional Authority of the Pardubický kraj



Maintenance of grassland in the flow profile Opavice in Krnov

region and the Regional Authority of the Zlínský kraj region carried out one inspection each at the Morava River Board, s. e. in respect of meeting the conditions for the grant allocation. Both inspections showed no shortcomings. The State Office for Nuclear Safety, regional centre in Brno, carried out one audit at the Morava River Board, s. e., with no shortcomings found. The National Accrediting Body carried out two audity at the Morava River Board, s. e. Both audits showed no negative findings. The Regional Veterinary Administration for the Moravskoslezský kraj region and the Ústecký kraj region carried out in total three inspections with no shortcomings found.

Audits at the Agricultural Water Management Administration are carried out by the respective controlling bodies. In 2011, the following comprehensive and selective audits were carried out at this organization.

### Ministry of Agriculture

The Ministry of Agriculture carried out two public inspections at the Agricultural Water Management Administration. The first inspection focused on the transfer of assets to state-owned enterprises River Boards, s. e. and the Forests of the Czech Republic, s. e. In connection with this inspection no major shortcomings were found and no corrective measures imposed. The latter inspection aimed to carry out audit of economy of the enterprise for the years 2008–2010, pursuant to the Act No. 320/2001 Coll., on financial audits in public administration and on amendments to some laws (Act on Financial Audits), and later it was extended for audit of the transfer of assets to state-owned enterprises River Boards, s. e. and the Forests of the Czech Republic, s. e. No corrective measures were imposed.

### External audits of the activities in the Economic Department

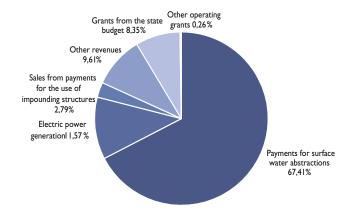
In 2011, in the Economic Department of the Agricultural Water Management Administration, five audits were carried out by the Czech Social Security Administration, two audits by the Health Insurance Company and one audit by the State Office for Labour Inspection. Two cases of unpaid balance of insurance payment in the total amount of CZK 21,780 were identifed and a penalty in amount of CZK 650 imposed.

## 6.2 River Boards, state enterprises

In the year 2011, the overall revenues generated by the River Boards, state enterprises after a long time showed a stagnation, even a slight decrease amounting to 0.2%, i.e. in absolute figures a decrease in revenues by CZK 7.4 million. This slight decrease was generated by all items included in the revenue structure, except for payments for surface water abstractions and other operating grants.

The year-on-year slight decrease in the overall revenues of the River Boards, state enterprises was mainly influenced by a decrease in electric power generation by CZK 71.8 million which corresponds to a year-on-year decrease amounting to 12%. The revenues from electric power generation in the majority of River Boards, state enterprises come solely from their own small hydroelectric power plants, only at the Ohře River Board, s. e., also photovoltaic power plant takes a share, to a smaller extent, in sales figures. The highest year-on-year decrease by 15.2% was recorded for revenues from payments for the use of impounding structures, i.e. a decrease in the absolute figure of almost CZK 22.8 million. The year-on-year decrease in the absolute figure of CZK 31.3 million was shown, similarly

Chart 6.2.1
Structure of the revenues of the River Boards, s. e. in the year 2011



Source: MoA

Table 6.2.1
Structure of the revenues of the River Boards, state enterprises in the year 2011 in thousands of CZK

Indicator	Elbe River Board, s. e.	Vltava River Board, s. e.	Ohře River Board, s. e.	Oder River Board, s. e.	Morava River Board, s. e.	Total
Payments for surface water abstractions	846,498	707,163	479,126	497,413	543,494	3,073,694
Electric power generation	44,387	217,348	169,488	65,682	30,831	527,736
Sales from payments for the use of impounding structures	6,896	112,184	3,260	0	4,956	127,296
Other revenues	80,646	103,820	109,694	93,210	50,719	438,089
Grants from the state budget	56,810	7,979	25,447	55,787	234,726	380,749
Other operating grants	2,401	945	1,950	913	5,800	12,009
River Boards, s. e. in total	1,037,638	1,149,439	788,965	713,005	870,526	4,559,573

Source: MoA, River Boards, s. e.

Table 6.2.2
Surface water supplies charged for in the years 2004–2011 in thousands of m<sup>3</sup>

River Board, s. e.		2004	2005	2006	2007	2008	2009	2010	2011
Ell D: D	a)	815,491	777,041	748,522	765,070	807,073	800,772	817,645	775,223
Elbe River Board, s. e.	b)	39,182	39,818	46,518	39,396	36,031	36,787	38,843	37,892
\// <sub>1</sub>	a)	274,084	262,532	263,685	260,008	252,659	243,528	238,582	230,817
Vltava River Board, s. e.	b)	163,896	160,483	161,528	155,382	153,131	146,670	144,164	140,087
Ohio Birra Barada	a)	162,934	155,315	161,071	152,636	150,115	148,330	141,308	135,730
Ohře River Board, s. e.	b)	57,033	53,644	55,385	52,410	51,514	50,299	49,550	46,162
Odan Dinan Baandaa	a)	163,874	165,044	171,301	164,087	153,946	138,961	144,155	138,942
Oder River Board, s. e.	b)	70,729	72,682	75,001	71,979	69,288	68,171	66,936	64,179
Manara Diran Dagada	a)	145,185	154,770	162,336	174,803	179,833	174,398	173,661	182,361
Morava River Board, s. e.	b)	36,969	34,953	34,128	33,554	32,553	31,233	31,063	31,861
River Boards, s. e.	a)	1,561,568	1,514,702	1,506,915	1,516,604	1,543,626	1,505,989	1,515,351	1,463,073
in total	b)	367,809	361,580	372,560	352,721	342,517	333,160	330,556	320,181

Source: River Boards, s. e. Note: a) charged for in total

b) of that for public water supply systems

to the previous year, by other revenues, i.e. a year-on-year decrease by 6.7%. A slight year-on-year decrease by 3.3% was shown by state budget subsidies, i.e. a decrease in the absolute figure of almost CZK I3 million. The year-on-year increase in sales for surface water abstractions amounting to 4.2%, i.e. in the absolute figure CZK I23.4 million almost balanced year-on-year decreases in sales shown by other revenue items. A year-on-year increase amounting to I74.2% was recorded for other operating grants, however, an increase in the absolute figure reached only CZK 7.6 million.

The structure of the revenues of the River Boards, state enterprises, in the year 2011 is shown in table 6.2.1. Chart 6.2.1 illustrates the proportion of the individual revenue types in the overall revenues of the River Boards, state enterprises. The development of the overall surface water supplies charged for in technical units in a longer time series is shown in table 6.2.2. Prices for the individual types of surface water abstractions are shown in tables 6.2.3 and 6.2.4.

In the River Boards, state enterprises, the average price of surface water in the context of other abstractions in the year 2011 ranged around CZK 3.61 per m³, this means an increase by 8.7%, compared to the previous year 2010. These prices are the so-called factually regulated prices, which may include only eligible costs, reasonable profit and the tax pursuant to the relevant tax regulations.

In addition to through-flow cooling, since the year 2003 abstraction levels and prices of surface water have also been identified for the purposes of charged agricultural irrigation and flooding of artificial depressions in the landscape. Except for the Oder River Board, s. e., in the year 2011 the River Boards, s. e. in total abstracted water for the purposes of agricultural irrigation in the amount of 161 thousand m³ which in the aggregate for all River Boards, state enterprises in the year-on-year comparison represents a decrease by 31 thousand m³ compared to the year 2010. This decrease in abstractions for the purposes of agricultural irrigation was shown by all River Boards, state enterprises, mainly by the Ohře River Board, s. e. and the Elbe River Board, s. e. The Ohře River Board, s.e., similarly to the

preceding years, is the only one reporting surface water abstractions for flooding of artificial depressions in the landscape, in the amount of 18.091 million  $m^3$ .

In the current approach the current prices do not reflect the value of surface water but the price of the service, i.e. enabling the provision of supplies ensured by River Boards, s. e. to water users.

These prices are subject regulated pursuant to Act No. 526/1990 Coll. on prices, and the rules stipulated by the decisions of the Ministry of Finance on price regulation, i.e. by the respective notifications issuing the list of goods with regulated prices which are published in the Price Journal.

In the year 2011 the River Boards, state enterprises reported in aggregate an increase in revenues from payments for surface water abstractions, which in absolute figures approximately amounts to CZK 121 million, compared to the year 2010, and corresponds to a year-on-year increase in this revenue category by 4.1%. The highest year-on-year increase amounting to CZK 62 million was reported by the Morava River Board, s. e., the Vltava River Board, s. e. showed a year-on year increase amounting to CZK 21 million and the Elbe River Board, s. e., the Ohře River Board, s. e. and the Oder River Board, s. e. reported a year-on-year increase in sales for surface water abstractions by approx. CZK 11-14 million. Payments for surface water abstractions in a ten-year time series are shown in table 6.2.5.

In the year 2011, compared to continuing year-on-year increases in the revenues from sales of electric power from small hydroelectric power plants owned by the River Boards, s. e., these revenues due to unfavourable hydrological situation showed a decrease by more than CZK 73 million. The total revenues in this revenue category amounted to CZK 525.5 million.

Despite decreased revenues from sales of electric power, compared to the year 2010, this revenue category takes the second place after the main source of revenues which are payments for surface water abstractions. Compared to the previous year, one small hydroelectric power plant owned by the Morava River Board, s. e. was put into operation, and the

Table 6.2.3

Price for abstractions used for through-flow cooling in the years 2002-2011 in CZK/m<sup>3</sup>

River Board, s. e.	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	0.65	0.39	0.40	0.40	0.40	0.44	0.49	0.53	0.55	0.60
Vltava River Board, s. e.	0.86	0.91	0.92	0.93	0.94	0.96	1.00	1.03	1.10	1.13
Morava River Board, s. e.	0.53	0.41	0.49	0.54	0.56	0.62	0.67	0.67	0.67	0.67

Source: River Boards, s. e.

Note: Unit price for  $m^3$  is quoted excluding VAT.

Table 6.2.4

Price for other surface water abstractions in the years 2002–2011 in CZK/m<sup>3</sup>

River Board, s. e.	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	1.88	2.04	2.20	2.35	2.51	2.70	2.93	3.16	3.35	3.63
Vltava River Board, s. e.	1.70	1.79	1.90	2.00	2.11	2.24	2.45	2.68	2.94	3.15
Ohře River Board, s. e.	2.23	2.33	2.41	2.53	2.71	2.85	3.01	3.16	3.31	3.53
Oder River Board, s. e.	2.01	2.08	2.12	2.40	2.53	2.70	2.89	3.10	3.35	3.58
Morava River Board, s. e.	2.89	3.06	3.12	3.26	3.49	3.88	4.19	4.65	4.97	5.47
Average price quoted by River Boards, s. e.*)	2.10	2.23	2.44	2.42	2.56	2.68	2.67	3.13	3.32	3.61

Source: River Boards, s. e., T. G. Masaryk Water Management Research Institute – public research institution

Note: Unit price for m<sup>3</sup> is quoted excluding VAT.

<sup>\*)</sup> Calculated by means of weighted average.

Table 6.2.5
Payments for surface water abstractions in the years 2002–2011 in millions of CZK

River Board, s. e.	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	566	613	669	669	678	705	735	785	833	846
Vltava River Board, s. e.	438	495	508	513	547	572	609	640	686	707
Ohře River Board, s. e.	399	427	420	393*)	434*)	434*)	450*)	469*)	468*)	479*)
Oder River Board, s. e.	347	359	347	396	433	443	445	431	483	497
Morava River Board, s. e.	300	368	359	362	394	420	440	457	481	543
River Boards, s. e. in total	2,050	2,262	2,303	2,333	2,486	2,574	2,679	2,782	2,951	3,072

Source: River Boards. s. e.

Note:  $^{*)}$  Since 2005 excluding sales from transport and abstraction of water.

total number of small hydroelectric power plants now is 90. The highest revenues from sales of electric power amounting to CZK 217.3 million are reported by the Vltava River Board, s. e. which operates 18 own small hydroelectric power plants. High revenues from sales of electric power amounting to CZK 167.3 million are also reported by the Ohře River Board, s. e. which operates the largest number of small hydroelectric power plants.

The sales achieved by the River Boards, s. e. reached their maximum of almost CZK 600 million in the year 2010. In the year

2011, a year-on-year increase amounting to CZK 5.1 million was reported only by the Oder River Board, s. e., the remaining River Boards, s. e. report a year-on-year decrease in revenues from sales of electric power. The highest decrease by CZK 21.6 million was reported by the Vltava River Board, s. e. In more detail, the information on the total number of small hydroelectric power plants owned by the individual River Boards, state enterprises, their installed capacity, electric power generation and sales is shown in table 6.2.6.

Table 6.2.6
Small hydroelectric power plants owned by River Boards, s. e. in the years 2006–2011

River Board, s. e	Indicator	2006	2007	2008	2009	2010	2011
	Number of small hydropower plants	19	19	20	20	20	20
Elbe River Board, s. e.	Installed capacity in kW	5,217	5,217	5,892	5,892	5,892	5,892
Board, S. e.	Electric power generation in MWh	18,619	19,270	18,325	20,356	23,589	20,871
	Sales in thousands of CZK	31,873	34,429	34,773	40,497	49,299	44,387
	Number of small hydropower plants	17	17	17	18	18	18
VItava River	Installed capacity in kW	18,400	18,400	18,400	21,200	21,200	21,341
Board, s. e.	Electric power generation in MWh	73,485	83,568	82,039	89,239	106,141	93,459
	Sales in thousands of CZK	126,279	151,919	181,435	208,580	238,981	217,348
	Number of small hydropower plants	20	20	21	21	21	21
Ohře River	Installed capacity in kW	16,677	16,677	16,949	16,930	16,930	16,930
Board, s. e.	Electric power generation in MWh	96,188	107,876	94,056	90,027	106,168	81,134
	Sales in thousands of CZK	167,066	209,510	197,824	194,911	214,290	167,297
	Number of small hydropower plants	14	14	16	16	16	16
Oder River	Installed capacity in kW	5,103	5,103	5,731	5,731	5,731	5,731
Board, s. e.	Electric power generation in MWh	20,801	25,827	31,964	28,662	30,937	28,113
	Sales in thousands of CZK	35,033	50,120	68,710	60,937	60,568	65,682
	Number of small hydropower plants	13	16	15	14	14	15
Morava River	Installed capacity in kW	3,400	3,530	3,522	3,482	3,482	3,495
Board, s. e.	Electric power generation in MWh	14,483	8,709	14,281	14,252	14,365	12,607
	Sales in thousands of CZK	24,394	14,982	34,922	36,024	35,623	30,831
Number of small hydropowe plants		83	86	89	89	89	90
River Boards, s. e.	Installed capacity in kW	48,797	48,927	50,494	53,235	53,235	53,389
in total	Electric power generation in MWh	223,576	245,250	240,665	242,536	281,200	236,184
	Sales in thousands of CZK	384,645	460,960	517,664	540,949	598,761	525,545

Source: MoA, River Boards, s. e.

Other revenues of the River Boards, state enterprises comprise a sum of less significant items including in particular the lease of land, non-residential premises and water bodies as well as revenues from other business activities, among which the most significant ones are the revenues from sales of machinery services and automobile transport services, laboratory work and from design and engineering activities, with capital yields also contributing to the overall level.

This item is often significantly affected by a number of unplanned items such as insurance payments, increased interest rates received and in many cases also by the amount of transfers of certain specified sales which relate to the past periods but were not materialized until this year. With regard to these unplanned items and variations that may not always be anticipated, other revenues also may show considerable year-on-year variations. In the year 2011, the overall year-on-year decrease in other revenues of the River Boards, state enterprises amounted to CZK 31.3 million. The overall year-on-year decrease in sales was reported by all River Boards, state enterprises, except for the Ohre River Board, s. e. which as the only one reported a slight increase by CZK 8.4 million. The highest year-on-year decrease amounting to CZK 15.5 million was reported by the Oder River Board, s. e. The summary of other revenues of the River Boards, state enterprises in a longer time series is shown in table 6.2.7.

Financial needs regarding the key activities of the River Boards, state enterprises are every year supported by a number of grants of both operating and investment nature. Without the state subsidies it would have been impossible to remedy the impacts of floods in the previous years and to start systematic activities allowing to implement flood control measures, define inundation areas and produce a number of conceptual studies.



Confluence the Opavy and the Opusta River

In the year 2011, the total amount of grants increased by 21%, compared to the year 2010, however with a different proportion of the impacts of operating grants and investment grants. Grants of operating nature showed a year-on-year increase by 6% and investment subsidies showed a year-on-year increase by 25.5%. In total the grants in the year 2011 amounted to CZK 2.068 billion. Grants are especially allocated for programmes focused on both prevention and remedying flood damages from previous years.

In addition to grants allocated through the budget of the Ministry of Agriculture, these subsidies also included means provided by the ERDF and by the Ministry of the Environment through the funds of the State Environmental Fund. Flood control measures were also co-financed with the contribution of certain regional authorities and statutory cities. The total operating (non-investment) and investment grants allocated to the individual River Boards, s. e. in the year 2011 are shown in table 6.2.8.

Table 6.2.7
Other revenues of River Boards, s. e. in the years 2003–2011 in thousands of CZK

River Board, s. e.	2003	2004	2005	2006	2007	2008	2009	2010	2011		
Elbe River Board, s. e.	68,368	87,233	92,256	162,403	115,334	105,185	129,663	89,889	80,646		
Vltava River Board, s. e.	136,859	85,855	77,430	304,594	73,143	82,165	128,136	113,624	103,820		
Ohře River Board, s. e.	67,525	59,410	73,068	80,937	74,837	110,493	117,623	101,250	109,694		
Oder River Board, s. e.	41,618	34,712	35,656	41,780	34,911	61,628	58,163	108,667	93,210		
Morava River Board, s. e.	55,643	48,960	58,411	61,959	46,423	78,966	69,306	56,000	50,719		
River Boards, s. e. in total	370,013	316,170	336,821	651,673	344,648	438,437	502,891	469,430	438,089		

Source: River Boards, s. e.

Table 6.2.8
Grants allocated to River Boards, s. e. in 2011 in thousands of CZK

River Board, s. e.	Operating grant	Investment grant	Grants in total
Elbe River Board, s. e.	59,211	623,915	683,126
Vltava River Board, s. e.	8,924	93,219	102,143
Ohře River Board, s. e.	55,3921)	185,907	241,299
Oder River Board, s. e.	56,700	263,819	320,519
Morava River Board, s. e.	243,182)	478,055	721,238
River Boards, s. e. in total	423,410	1,644,915	2,068,325

Source: MoA, River Boards, s. e.

Note: <sup>1)</sup> The actual use of grants in 2011 amounted to 123,836 thousands of CZK (of that 5,938 thousands of CZK expended in 2010, grant allocated in 2011), transfer to the next period is not guaranteed for grants in amount of 6,518 thousands of CZK.

<sup>&</sup>lt;sup>2)</sup> The difference in this sum compared to the table showing the structure of revenues and sales is caused by the grant invoicing date and returning part of the grant to the city of Olomouc.

In the year 2011 the total costs amounted to CZK 4,494 billion, having reached approximately the level of the year 2010. The highest year-on-year increase was recorded for the items of depreciation and personnel costs, on the other hand, other costs showed a rapid year-on-year decrease by CZK 137 million, i.e. a decrease by 78%.

The highest increase in costs was reported by the Morava River Board, s. e. In contrast, a significant decrease in costs was reported by the Vltava River Board, s. e. The summary of costs in the year 2011 reported by the River Boards, s.e. and their comparison with the previous year is shown in table 6.2.9.

In the year 2011, River Boards, s. e. expended on investments the amount of CZK 2,732.3 million. Of this sum, approx. the amount of CZK 811 million was drawn from their own resources and the additional amount of over CZK 1,921 million not covered by the River Boards, s. e. own resources was expended on investments.

Compared to the previous year the investments made by the River Boards, state enterprises, in the year 2011 increased in total by CZK 440.8 million. The summary of investment funds over a longer time series is shown in table 6.2.10 and chart 6.2.2.



The Jizera River

Table 6.2.9
Costs in 2010 and 2011 reported by River Boards, s. e. in millions of CZK

Type of cost	Year	Elbe River Board, s. e.	VItava River Board, s. e.	Ohře River Board, s. e.	Oder River Board, s. e.	Morava River Board, s. e.	River Boards, s. e. in total
D 1.0	2010	158.5	285.9	184.9	128.7	135.5	893.5
Depreciation	2011	166.4	320.4	196.6	140.2	157.2	980.8
ъ .	2010	210.2	244.6	206.7	213.4	242.5	1,117.4
Repairs	2011	198.0	217.9	196.5	222.3	311.0	1,145.7
Maria	2010	51.0	27.1	23.7	40.4	45.2	187.4
Material	2011	48.4	27.4	19.5	39.5	47.8	182.6
- 16 1	2010	40.9	35.3	37.7	6.2	14.0	134.1
Energy and fuels	2011	45.6	40.8	39.3	5.8	12.2	143.7
D 1 .	2010	436.4	386.8	300.9	208.2	282.1	1,614.4
Personnel costs	2011	444.4	406.5	300. I	219.1	295.1	1,665.2
<u> </u>	2010	81.1	118.3	37.3	53.1	35.1	324.9
Services	2011	90.6	89.2	34.8	42.3	36.6	293.5
F: :1 /	2010	0.4	4.5	0.6	0.3	0.0	5.8
Financial costs	2011	0.3	3.6	0.6	0.2	0.5	5.2
0.1	2010	46.9	100.4	2.1	48.8	16.5	214.7
Other costs	2011	14.0	30.9	-3.2*)	30.9	4.7	77.3
Total anata	2010	1,025.4	1,202.9	793.9	699.1	770.9	4,492.2
Total costs	2011	1,007.7	1,136.7	784.2	700.3	865.1	4,494.0

Source: River Boards, s. e.

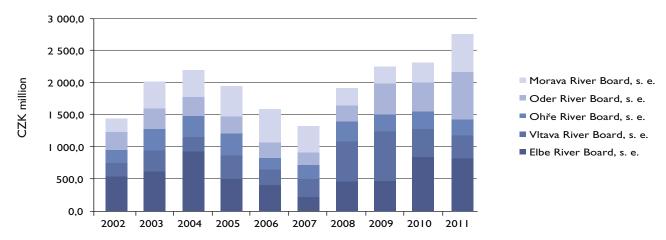
Note: \*) accruals from the previous year were used

Table 6.2.10
Investments made by the River Boards, s. e. in the years 2002–2011 in milions of CZK

River Board, s. e.	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	529.1	607.6	915.2	485.2	394.9	212.0	455.0	459.0	829.8	806.7
Vltava River Board, s. e.	199.3	321.6	219.0	362.4	236.6	275.2	611.3*)	761.1*)	428.3	346.7
Ohře River Board, s. e.	212.8	339.8	329.5	354.4	170.4	215.7	322.5	277.5	287.4	265.8
Oder River Board, s. e.	282.3	316.3	301.3	260.6	254.7	199.7	244.2	473.5	443.4	741.2
Morava River Board, s. e.	200.5	407.4	411.9	462.3	518.2	413.5	257.8	254.5	302.6	571.9
River Boards, s. e. in total	1,424.0	1,992.7	2,176.9	1,924.9	1,574.8	1,316.1	1,890.8	2,225.6	2,291.5	2,732.3

Source: MoA, River Boards, s. e.

Chart 6.2.2
The development of capital construction in River Boards, s. e. in the years 2002–2011



Source: MoA, River Boards, s. e.

The financial results reached by all River Boards, state enterprises showed only a profit. The profit reached the total amount of CZK 65 million.

Compared to the previous year, the total profit is lower by CZK 10 million. Except for the Elbe River Board, s. e., all River Boards, state enterprises reached worse economic results, compared to the year 2010.

Profit/loss development over the recent eight years and the share of the individual River Boards, s. e. in the total profit/loss is documented in table 6.2.11. In more detail, a breakdown of profit into individual funds along with the proposals for covering losses in the respective River Boards, s. e. are shown in table 6.2.12.



Confluence the Labe and Malého Labe River

Table 6.2.11
Profit/loss of River Boards, s. e. in the years 2004-2010 in thousands of CZK

River Board, s. e.	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	39,445	36,777	6,132	15,798	16,692	30,050	27,509	29,908
Vltava River Board, s. e.	42,008	34,376	177,869	67,625	23,375	30,265	13,530	12,702
Ohře River Board, s. e.	16,817	17,070	47,735	71,817	22,401	30,371	11,776	4,758
Oder River Board, s. e.	11,877	16,680	56,401	24,595	29,296	13,964	13,785	12,721
Morava River Board, s. e.	37,142	13,038	11,054	12,417	13,035	15,295	8,171	5,355
River Boards, s. e. in total	147,289	117,941	299,191	192,252	104,799	119,945	74,771	65,444

Source: River Boards, s. e.

Table 6.2.12
Proposed allocation of profit of River Boards, s. e. for the year 2011 in thousands of CZK

		Allocation of profit or loss									
River Board, s. e.	Profit	Reserve fund	Fund for Social and Cultural Requirements	Investment fund	Social fund	Remuneration fund	Accumulated losses from previous years				
Elbe River Board, s. e.	29,908	2,991	8,000	12,917	0	6,000	0				
Vltava River Board, s. e.	12,702	0	7,000	0	50	5,652	0				
Ohře River Board, s. e.	4,758	509	4,249	0	0	0	0				
Oder River Board, s. e.	12,721	0	0	0	6,051	6,670	0				
Morava River Board, s. e.	5,355	536	4,302	0	0	517	0				

Source: MoA, River Boards, s. e.

The average recalculated number of employees in River Boards, state enterprises increased in the year 2011 by 122 employees to a total of 3,577 persons.

A significant increase in the total number of employees is caused due to the transformation of the Agricultural Water Management Administration, i.e. the transfer of employees from the Agricultural Water Management Administration to the River Boards, state enterprises, under the relevant provisions of the Act No. 262/2006 Coll., Labour Code, as amended. The highest increase in the number of employees was reported by the Vltava River Board, s. e., by 67 employees on average. An overview of the development in the numbers of employees of the significant watercourse administrators is shown in table 6.2.13.

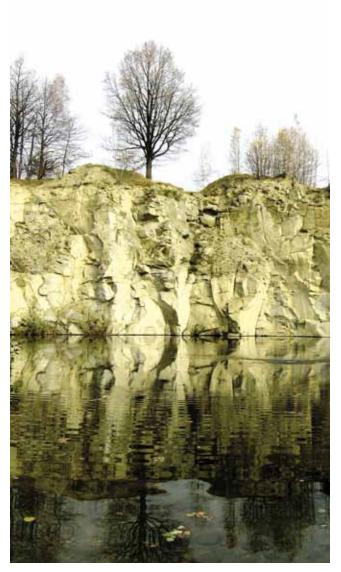
Table 6.2.13
The number of employees of River Boards, s. e. in the years 2010 and 2011 (average recalculated number)

River Board, s. e.	2010	2011
Elbe River Board, s. e.	939.7	947.1
Vltava River Board, s. e.	779.2	846.3
Ohře River Board, s. e.	604.9	620.7
Oder River Board, s. e.	457.2	464.3
Morava River Board, s. e.	673.9	698.0
River Boards, s. e. in total	3,454.9	3,576.4

Source: River Boards, s. e.

The average monthly salary in the River Boards, state enterprises in the year 2011 amounted to CZK 28,126.

Compared to the previous year, the average monthly salary in River Boards, s. e. increased by approximately CZK 200. Except for the Vltava River Board, s. e., all the remaining River Boards, s. e. reported an increase in the average monthly salary. The highest annual increase by CZK 915 is reported by the Oder River Board, s. e. The Morava River Board, s. e., despite the annual increase in the salary by CZK 502 continues to report the lowest average monthly salary amounting to CZK 25,812. The average monthly salaries are specified in table 6.2.14.



Quarry in the Vidnávka River

Table 6.2.14

Average salaries in the individual River Boards, s. e. in the years 2004–2011 in CZK/month

River Board, s. e.	2004	2005	2006	2007	2008	2009	2010	2011
Elbe River Board, s. e.	20,125	21,781	23,036	24,318	25,778	27,283	28,209	28,350
Vltava River Board, s. e.	20,556	21,909	23,414	24,611	27,325	28,300	28,864	28,311
Ohře River Board, s. e.	20,661	22,091	23,464	24,971	26,794	28,620	29,759	30,148
Oder River Board, s. e.	19,656	21,050	22,337	23,817	25,534	26,104	27,190	28,105
Morava River Board, s. e.	17,975	19,233	20,798	22,052	23,823	25,778	25,310	25,812
Average monthly salary in River Boards, s. e. *)	20,072	21,243	22,637	23,954	25,856	27,283	27,905	28,126

Source: River Boards, s. e.

Note: \*) Calculated by means of weighted average.

# **6.3 Agricultural Water Management Administration**

In the last quarter of 2010 and during the year 2011, the Agricultural Water Management Administration went through a major transformation process which was implemented as defined by the Order No. 27/2010 of the Minister of Agriculture to carry out the transfer of activities and the subsequent abolition of organizational

unit of the state, the Agricultural Water Management Administration, with the transfer of property, rights and liabilities to state-owned River Boards, s. e. and Forests of the Czech Republic, s. e.

The aim of transformation of the Agricultural Water Management Administration is to strengthen integrated administration of watercourses and integrated management of water resources in hydrological catchments in the Czch Republic. The transformation should result, among other things, in reduced requirements

concerning the use of state budget funds, through cutting costs of maintenance of transferred property as well as running costs of the organization.

The actual transfer of water management property and other assets associated with the transfer of administration of minor watercourses to state-owned enterprises was carried out under the Agreement on gratuitous transfer of competence to manage the assets, rights and liabilities and on their acceptance into the right to carry out business. Pursuant to the provisions of this Agreement it was proceeded also in the case of property that under the provisions of Section 48, subsection 2 of the Act No. 254/2001 Coll., on Waters, as amended, was transferred to state-owned enterprises on the basis of decision of the Ministry of Agriculture of 23 November 2010, ref. No. 33747/2010-15110, rectification resolution of the Ministry of Agriculture of 16 December 2010, ref. No. 37255/2010-15110, decision of the Ministry of Agriculture of 21 December 2010, ref. No. 35934/2010-15110 and rectification decisions of the Ministry of Agriculture that were issued on the basis of suggestions made by the parties participating in the procedure.

Based on Deed of Foundation of 14 December 2010, the subject of activity of the Agricultural Water Management Administration, with effect from 1 January 2011, is to carry out the administration of main drainage facilities and the related hydraulic structures and keep records of the above mentioned property.

Following the wording of Deed of Foundation, a new organizational structure of the Agricultural Water Management Administration was established. By the relevant decision of the General Director, with effect from I January 2011, all existing organizational units and departments of the Agricultural Water Management Administration were abolished. The new basic organizational units of the Agricultural Water Management Administration are the Directorate situated in České Budějovice and three Regional Offices in České Budějovice, Hradec Králové and Brno. Registered office of the organization remained the same.

For 274 employees, in connection with the transfer of activity "administration of minor watercourses", with effect from I January 2011, the rights and obligations resulting from labour relations were transferred under Section 338 and foll. of Labour Code. The employers taking over these employees became state-owned enterprises River Boards, s. e. and Forests of the Czech Republic, s. e. The number of employees of the Agricultural Water Management Administration at the end of the first quarter of 2011, after the closure of the accounting year 2010, decreased to 45.

The main priority of the Agricultural Water Management Administration in the year 2011 was the transfer of water management property and own operating property to six state-owned enterprises and the Ministry of Agriculture. The transfer of water management property was carried out not only based on the decision of the Ministry of Agriculture under Section 48, subsection 2 of the Act No. 254/2001 Coll., as amended, under the provisions of framework agreement (the related line structures, water reservoirs, land), but also based on separate contractual relationships in the cases where the hydraulic structures owned by the Agricultural Water Management Administration were located on watercourses under historical administration of state-owned enterprises or administration carried out by other administrators (such as municipalities, natural or legal persons).

The transfer of property also included transfer of all unfinished projects funded through the grants of the Ministry of Agriculture and the Ministry of the Environment, including related documentation. All project documentations and related materials concerning the completed projects (including documentation relating to the main drainage facilities) were transferred to the relevant state-owned enterprises (the River Boards, s. e. only).

In terms of transfer of own operating property, the most important items included buildings, office equipment, software equipment, property entrusted to employees for their personal use and automobiles.

Under the provisions of the so-called framework agreement on gratuitous transfer of property, during 2011 the property in the following actual prices was transferred to state-owned enterprises River Boards, s. e. and Forests of the Czech Republic, s. e.:

- Vltava River Board, s. e. CZK 3.030 billion
- Ohře River Board, s. e. CZK 0.957 billion
- Elbe River Board, s. e. CZK 1.663 billion
- Morava River Board, s. e. CZK 2.407 billion
- Oder River Board, s. e. CZK 0.770 billion
- Forests of the Czech Republic, s. e. CZK 2.278 billion

In total, according to Summary Protocols, under the provisions of the framework agreement, the property in actual prices amounting to CZK 11.105 billion was transferred to state-owned enterprises. This amount does not include water management property that was transferred to state-owned enterprises through own agreements in amount of approx. CZK 0.5 billion and also does not include property that was transferred to the Ministry of Agriculture.

The main subject of activity of the Agricultural Water Management Administration in accordance with the valid Deed of Foundation is the execution of administration and management of main drainage facilities and the related hydraulic structures owned by the Czech Republic. Main drainage facilities are defined under Section 14, subsection 6 of the Act No. 229/1991 Coll., on regulations of ownership of land, as amended, under Section 56, subsection 2 of the Act No. 254/2001 Coll., on waters and on amendment to some laws, as amended, and under Section 2, subsection 5 of the MoA Decree No. 225/2002 Coll., on detailed definition of structures for water management reclamation of lands and their parts and on the manner and scope of their management, as a set of structures that are used to drain excess surface water and groundwater from the land, to aerate the land and to protect the drained land from flooding with outer waters. These structures especially include open channels (collecting drainage ditches, capturing ditches and dry polders to capture outer water, damming structures and structures used for regulation), channels regulated in pipelines (inner diameter 30 cm and more), including structures on them (drops, chute spillways) and drainage pumping stations. Main drainage facilities are structures built in the public interest, mostly on foreign land.

According to the inventory of water management property as of 31 December 2011, the Agricultural Water Management Administration carrries out the administration of property falling into the category of main drainage facilities, namely 5,127 km of open channels, 3,770 km of channels regulated in pipelines, 18 reservoirs relating to drainage systems, 527 culverts and 133 pumping stations. The total acquisition value of this non-current tangible property amounts to CZK 2.527 billion.

In connection with administration of the above mentioned property, employees of the Agricultural Water Management Administration perform especially the following activities: inspection walks and reports thereof, preparation of project documentation for maintenance, supervision of performing maintenance by external suppliers until hand-over protocol acceptance including the obligation to report to the relevant state administration bodies, keeping basic information in the database information systems of the organization and inventory thereof, making statements on structures that are of concern for main drainage facilities, participation in general planning proceedings, building permit proceedings and acceptance certificate

proceedings, participation in the meetings before and during construction and ensuring legal acts relating to the administration of main drainage facilities, including property rights issues.

The funds allocated to the Agricultural Water Management Administration, with the objective of ensuring the proper function and operability of the main drainage facilities and related hydraulic structures as well as the maintenance, repairs and remedying of the states of disrepair, amounted to CZK 15 million. The maintenance of the main drainage facilities included in particular mowing, clearing of canals to ensure runoff from the drainage systems, elimination of non-indigenous invasive plant species (hogweed, Japanese knotweed) and maintenance of riparian stand. The funds allocated for current maintenance were partially used to take immediate action due to emergency situations. To ensure the operation of main drainage facilities, especially pumping stations, the Ministry of Agriculture released the funds in the amount of CZK 15 million.

A summary of the actual use of funds allocated for measures of non-investment nature in the year 2011 is shown in table 6.3.1.

Table 6.3.1

The use of individual non-investment financial resources of the Agricultural Water Management Administration in the year 2011 in millions of CZK

Activity	Resource	Budget	Reality
Maintenance of main drainage facilities	State budget	15	14.8
Operation of main drainage facilities	State budget	15	14.3
Other non-investment expenditures	State budget	-	-
Total		30	29.1

Source: Agricultural Water Management Administration

Non-investment expenses drawn for maintenance, repairs and operation of main drainage facilities by individual territorial units of the Agricultural Water Management Admnistration are shown in table 6.3.2.

Table 6.3.2

Non-investment expenses on maintenance and repairs of main drainage facilities administered by the Agricultural Water Management Administration in the year 2011 by river basin districts in millions of CZK

River basin district	Maintenance of main drainage facilities	Operation of main drainage facilities	Total
Elbe River	ver 2.8		5.8
Vltava River	5.5	1.2	6.7
Morava River	orava River 6.5 10.1		16.6
Total	14.8	14.3	29.1

Source: Agricultural Water Management Administration

The revenues of the Agricultural Water Management Administration have the nature of its own business activity income with other revenues comprising supplementary, incidental and other revenues. Revenues received in the year 2011 amounted in total to CZK 2.3 million, having exceeded the planned figure for 2011. Schedule of income for 2011 was considerably reduced, compared to the year 2010, due to a large transfer of property. The overall structure of revenues of the Agricultural Water Management Administration is shown in table 6.3.3.

Table 6.3.3

Structure of revenues of the Agricultural Water Management Administration in millions of CZK in the years 2006–2011

Revenues	2006	2007	2008	2009	2010	2011
Payments for water abstractions	4.2	2.9	2.9	2.2	2.0	0.2
Rentals of hydraulic structures	5.4	3.4	3.4	3.9	5.1	0.4
Other revenues	2.7	4.7	11.3	7.8	8.8	1.7

Source: Agricultural Water Management Administration

## 6.4 Forests of the Czech Republic, s. e.

Forests of the Czech Republic, state enterprise, performs the administration of the specified minor watercourses and torrents as one of its important functions. At present, the Forests of the Czech Republic perform the administration of more than 39 thousand km of watercourses. A significant increase in the length of watercourses, compared to the year 2010, was caused by the transformation of the Agricultural Water Management Administration.

Watercourse management carried out by the Forests of the Czech Republic, s. e. includes the administration of non-current assets relating to watercourses, with an acquisition value of CZK 5.2 billion (in particular watercourse regulation, torrent and ravine control, flood control measures and reservoirs). The increase in the value of the property, compared to the year 2010,

was caused by the transformation of the Agricultural Water Management Administration. The watercourse administration was managed by the Water Management Department at the Head Office of the Forests of the Czech Republic, s. e. and was carried out by six Watercourse Administrations, with territorial responsibility according to the respective river basin districts.

In the year 2011, the activities of the Forests of the Czech Republic in the field of water management were focused in particular on:

- the process related with the transformation of the Agricultural Water Management Administration (taking over the administration of watercourses, water management property, operating property and other property or land),
- addressing flood situations in 2011,
- remedying flood damage from the previous years (2009 and 2010),

- implementation of both capital investment projects and non-investment projects aimed at flood control measures, erosion control measures and also the public interest projects pursuant to Section 35 of the Forest Act,
- other activities aimed at riparian stand management, revitalization of watercourses which were improperly regulated in the past, non-productive forest functions, support of endangered species, elimination of nonindigenous invasive plant species, etc.

Through the Order No. 27/2010 of the Minister of Agriculture, it was decided to perform the transformation of the Agricultural Water Management Administration. As a result of this decision, the Forests of the Czech Republic took over from the Agricultural Water Management Administration the management of more than 14 thousand km of watercourses and the related property on watercourses. Within the concurrent refinement of the Central Register of Watercourses, the total length of the administered watercourses increased to 39 thousand km. Based on the "Agreement on gratuitous transfer of competence to manage the assets, rights and liabilities and on their acceptance into the right to carry out business", from the beginning of 2011 between the Agricultural Water Management Administration and the Forests of the Czech Republic there proceeded a gradual transfer (handover) and take-over of the property of the Agricultural Water Management Administration, through appropriate protocols. Final Summary Protocol, which is a list of all protocols and forms Annex to the above mentioned Agreement, was prepared and signed on 30 December 2011. The total acquisition value of the property taken over amounts to more than CZK 2.4 billion, (of which substantial part is formed by the so-called "water management property" reaching the value of CZK 2.2 billion).

The watercourse administration and the implemented measures (repairs, rehabilitation and new investments) were financed from the organization's own resources and to a certain extent from grants and subsidies. As regards subsidies, the funds in question include measures carried out in the public interest pursuant to Section 35 of the Forest Act, financial resources from the state budget allocated for the programmes of the Ministry of Agriculture "Support for Flood Prevention II" and "Support for Remedying Flood Damages to State-owned Water Management Property" pursuant to Section 102 of the Water Act. In addition, the Forests of the Czech Republic, s.e. also used the EU funds from the "Operational Programme Environment" and the "Programme of Rural Development". Measures relating to minor watercourses are also to a certain extent funded by the Regional Authorities. The activities carried out in connection with watercourse administration are of a non-commercial nature and with regard to the overall funds expended they generate virtually no profit. The revenues from payments covering the watercourse administration amounted to almost CZK 13 million.

In connection with watercourse administration, the Forests of the Czech Republic, s. e., through its organizational units, the Watercourse Administrations, disbursed in total CZK 697.9 million (see table 6.4.1), including expenditures of capital investment nature amounting to CZK 301.9 million. Its own funds used for these investments amounted to CZK 153.1 million. In total CZK 396.0 million, including CZK 357.4 million of own funds were used to perform the administration, repairs and maintenance of torrent control structures. In total CZK 252.3 million, including CZK 183.8 million of own funds were expended on remedying flood damage. The above mentioned amounts include all costs relating to watercourse administration.

Table 6.4.1
Structure of financing watercourse administration by the Forests of the Czech Republic, s. e. in the year 2011 in millions of CZK (full costs)

Facesta of the Good Bounding	Own resources	Subsidies in	Of that flo	ood damages
Forests of the Czech Republic, s. e.	in total	total	Subsidies	Own resources
Investments	153.1	148.8	39.2	75.9
Non-investments	357.4	38.6	29.3	107.9
Total	510.5	187.4	68.5	183.8

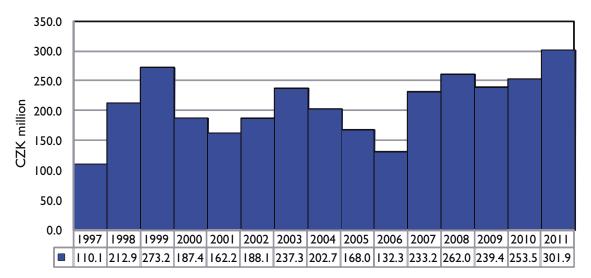
Source: Forests of the Czech Republic, s. e.



Flood control measures of Brabínek, the Nová Hradečná area

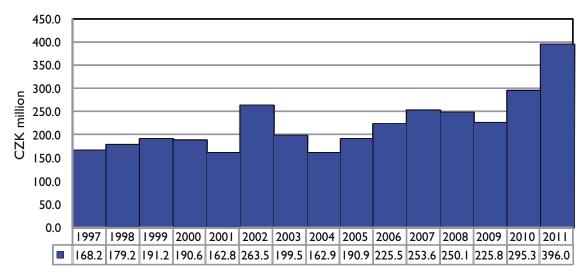
Chart 6.4.1

Capital expenditures of the Forests of the Czech Republic, s. e. in the years 1997-2011 in millions of CZK - watercourses



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

Chart 6.4.2 Expenditures of the Forests of the Czech Republic, s. e. in the years 1997–2011 in millions of CZK – repair and maintenance of watercourses (gross expenditure)



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

The Charts 6.4.1 and 6.4.2 provide in a longer time series an overview of the overall capital expenditures and the funds spent on repairs and maintenance.

### Measures in river basins

In the year 2011, the main activity for the Watercourse Administration for the Oder River basin district, based in Frýdek-Místek, continued to be the actions aiming to remedy flood damage from June 2009 and especially from May 2010. The most extensive completed projects in the Jeseník area include remedying of flood damage to the Lánský stream between km 11.600 and km 12.177, the Priessnitz stream between km 0.200 and km 0.800, the Červený stream between km 2.000 and 5.186, stage I, the Stříbrný stream between km 0.000 and km 1.800, stage I and left-hand tributary to the Bělá River in km 21.2. In the Nový Jičín area, the completed projects include remedying of flood damage to the Jičínka River between km 20.500 and

km 23.550 and between km 10.400 and km 12.900, the Zrzávka River between km 1.500 and km 4.200, in the Frýdek-Místek area regulations on the Satina River in km 3.350 and repair of five stone drops on the Čeladenka River.

In addition to the above mentioned activities concerning the remedying of flood damage, the Watercourse Administration for the Oder River basin district completed the execution of a number of comprehensive preventive flood control measures, of which the most significant include measures on the Zrzávka River, the Jičínka River, the Skorošický stream, the Vojtovický stream and the Čeladenka River. During 2011, measures on the Čeladenka River between km 3.057 and km 3.942 and on the Říčka River in Janovice between km 0.500 and km 1.710 were completed. Through the completion of the above mentioned measures, the protection and safety of the residents and property in the event of flood has markedly improved.

As regards measures taken in the public interest pursuant to Section 35 of the Forest Act, in total eight projects were completed, for example, on the Podolský, the Kopytnice and the Hrozský streams.

The Watercourse Administration for the Dyje River basin district, based in Brno, was afflicted in 2011 by local floods that occurred in the Jihomoravský region in the surroundings of Letovice and Podhradí nad Dyjí, in the Vysočina region in the surroundings of the municipality of Trnava and in the Pardubický region in the municipality of Svojanov. Increased flows, however, did not cause major damage.

Also six projects co-financed from the programme "Flood Prevention II" were completed, of which the most significant are polder Březinka in the Třebíč area in the municipality of Trnava and flood control measures on the Korouhevský stream in the Pardubický region in the municipality of Korouhev. Another nine projects, the execution of which is under way and which are co-financed from the programme "Flood Prevention II", will continue to be executed in the year 2012. In addition, preparatory work for the execution of projects taken over within the transformation of the Agricultural Water Management Administration continues or was commenced. Most significant of these projects is construction of dry polders in the municipality of Čeložnice and increase in the Hodonínka stream channel capacity in the municipality of Olešnice.

Two projects receiving support from the Rural Development Programme were successfully completed. In the territorial scope of the Watercourse Administration, three projects were completed and five new projects started in the form of measures taken in the public interest pursuant to Section 35 of the Forest Act.

The Watercourse Administration for the Elbe River basin district, based in Hradec Králové, also in 2011 executed projects aiming to remedy flood damage from August 2010 in the Liberec area and the Frýdlant area. In the municipality of Bílý Potok pod Smrkem, projects aiming to remedy flood damage to the Černý balvanitý stream and the Velká rybí voda stream were completed, the execution of the project on the Hájený stream is under way. Other projects, the execution of which is under way, include, for example, flood control measures on the Sloupský stream, the Malý Sloupský stream and the Černý stream in the municipality of Hejnice, on the Kunratický stream in the municipality of Kunratice u Frýdlantu and on the tributaries of the Lužická Nisa River in Bílý Kostel nad Nisou.

New projects aiming to remedy flood damage from July and September 2011 were executed in the Liberec area and the Rychnov nad Kněžnou area. Own resources in the amount of approx. CZK 3 million were used to fund securing works and repairs. Flood damage was especially reported in the Liberec area on the tributaries of the Jeřice River and in the Rychnov nad Kněžnou area on the Rybenský stream in Rybná nad Zdobnicí.

Under the programme "Flood prevention II", the subsidized projects on the Bartošovický stream and the Liberský stream – Langerova pila in the Rychnov nad Kněžnou area, on the Lovětínský stream near Čáslav and flood control measures in Vysočina near Hlinsko were completed.

One project receiving support under the Operational Programme Environment, namely the revitalization of in the past improperly regulated watercourse, a tributary of the Jindřichovický stream in the Liberec area, was completed. Under this programme, four new applications for support from the State Environmental Fund of the Czech Republic were submitted and accepted.

Own resources of the Forests of the Czech Republic were used to fund other projects of both investment and non-investment nature. They include, for example, in the Krkonoše area a small

water reservoir Třídomí, measures on the Zlatnice, the Veselka, the Staroveský, the Lhotecký and the Odolenovický streams, in the Liberec area retention basins Od Vlčích jam and Rizengrunt and int the Pardubice area Ležák and Vchýnická svodnice. In the area of the Orlické hory Mountains it is, for example, the Helvíkovický stream or securing the Šerlišský Mlýn ravine.

The funds under the Programme 2020 "meeting the objectives of the public interest by the Forests of the Czech Republic" were used by the Watercourse Administration to continue in the reintroduction of brook minnow ((phoxinus phoxinus) and rainbow trout in the Protected Landscape Area Jizerské hory Mountains, the elimination of non-indigenous invasive plant species (knotweed, impatients) along watercourses and the construction of information and rest facilities for the public (sheds and information boards).

In the year 2011, the Watercourse Administration for the Vltava River basin district, based in Benešov, reported increased flood flows on watercourses, mainly on tributaries in the Berounka River basin. Within the framework of securing works, twenty one non-investment projects were executed, of that five projects continue to be executed in the year 2012. One capital investment project continues to be executed in 2012.



The Třebíšský stream in Prunéřov

In the year 2011, several significant projects on watercourses, cofinanced under programmes of support, were completed. Larger completed projects under the programme "Flood Prevention II" include regulations on the Třebanický stream in Hostomice (acceptance certificate procedure will take place in 2012). The project of flood control measures on the Podvecký stream started and will continue in the next period. The execution of the projects of Býkov water reservoir and increasing the Pivoňka stream channel capacity in Poběžovice, taken over from the Agricultural Water Management Administration after its transformation, continues to be under way.

Other significant activities include the completed capital investment projects of the Vltava River tributary from Rožmberka II in the České Budějovice area and reconstruction of U Fialky water reservoir in the Plzeň area (acceptance certificate procedure will take place in 2012) carried out in the public interest pursuant to Section 35 of the Forest Act. In addition, a project of reconstruction of retention reservoir Raška I in the Plzeň area and a project of small water reservoir in Sepekov in the Tábor area started and will continue to be executed in the next period.

Also two projects of remedying flood damage, taken over from the Agricultural Water Management Administration, started in 2011. These are projects of remedying flood damage to the Kojetický stream in the Domažlice area and a tributary to the Krásetínský stream in the Český Krumlov area.

Also the territory managed by the Watercourse Administration for the Ohře River basin district, based in Teplice, was several times afflicted by floods. For that reason, in the year 2011 the majority of both capital investment projects and non-investment projects focused on the remedying of flood damage.

The remedying of flood damage from the year 2009 on the Folgenský stream, the Dobrnský stream, the Folknářský stream and the Lužecký stream in the Děčín area was completed.

Furthermore, during 2011 there were executed works aiming to remedy flood damage from the year 2010 on the Jakubský stream, the Studený stream and the Ludvíkovický stream in the Děčín area, on the Průčelský stream, the Pekelský stream and the Luční stream in the district of Ústí nad Labem. In addition, projects Přerov I and Přerov 2 as projects of remedying flood damage to nameless tributaries of the Elbe were executed.

There also started projects aiming to remedy flood damage on the Veleňský stream and the Těchlovický stream in the Děčín area, the Zdislavský stream in the Liberec area, the Kněžický stream in the Česká Lípa area and the Kojetický stream in the district of Ústí nad Labem. These projects are expected to be completed in 2012.

Under the programme of support for the protection of forest land, a regulation of the tributary of the Lesní stream in Šluknov was carried out and projects Retention Reservoir Černý rybník and Bílý stream at Nové Hamry in the Karlovarský region continued. Their completion is expected at the beginning of 2012.

The funds under the programme Objective 3 of the EU tu support transboundary cooperation between the Czech Republic and the

Free State of Saxony 2007–2013 were used in 2011 to construct a retention damming on the Rašeliník stream upstream of the Fláje water supply reservoir, completed under the research project focusing on the possibilities to remove humic substances washed out from upland peat parts of the Krušné hory Mountains to drinking water resources.

The territory managed by the Water Administration for the Morava River basin district, based in Vsetín, especially the area of the Hostýnské vrchy hills was afflicted by local floods at the turn of June and July 2011, with maximum flows reaching the values of  $Q_{100}$  and higher. The completed regulations of stream channels were devastated and stream bed level line recessed. Already during the flood actions were carried out to release stream channels and just after the flood most severe damage was immediately remedied within the framework of securing actions (especially in the municipalities of Rusava, Všemina, Brusné and Chomýž). The remedying of other damage is in the stage of preparation of project documentation and scheduled for construction projects in the years 2012 and 2013.

The remedying of flood damage in the Rožnovská Bečva River basin from the years 2009 and 2010 continued. Remedial actions on the Hodorfský stream, the Krhovský stream, the Čertoryjský stream, the Činovský stream, the Zašovský stream and on the Ludina River in Hranice were completed. Other flood damage was remedied also on the Vranča and the Velká Hanzlůvka watercourses in the Vsetín area.

In the year 2011, the Water Administration for the Morava River Basin district, based in Vsetín, completed the execution of six projects co-financed under the programme "Flood Prevention II", of which most important is the project on the Brabínek stream, between km 0.300 and km 1.600, executed in the municipality of Nová Hradečná in the Uničov area. The project included an adaptation of stream channel and banks in a length of 1.3 km. Another project focused on adaptation of the Vidovka stream in Želechovice in the Zlín area, namely increase in stream channel capacity in a length of 0.8 km in the built-up part of the municipality of Želechovice.

Under the "Rural Development Programme", also two projects of repair of the existing torrent control structures in the municipalities of Hanušovice and Nový Malín in the Šumperk area were completed.

Pursuant to Section 35 (the public interest) of the Forest Act, several projects were successfully executed on the territories of the Zlínský region and the Olomoucký region. Two of these projects focused on construction of new retention structures. In the Uherské Hradiště area it was a project Rákoš I and in the Uničov area a project focusing on the left-hand tributary of the Ostrava River. The remaining projects focused especially on repairs of torrent control structures and stabilization of watercourses. Most significant of them include, for example, the Velká Hanzlůvka stream in the Vsetín area and the right-hand tributary of the Rokytenka River in Rokytná u Slavičína.

Table 6.4.2 shows development of revenues of the Forests of the Czech Republic, s. e. from sales of surface water and unit prices.

Table 6.4.2
Revenues of the Forests of the Czech Republic, s. e. from sales of surface water in the years 2005-2011 in thousands of CZK

Year	2005	2006	2007	2008	2009	2010	2011
Sales	9,483	9,581	10,010	10,380	10,542	11,239	12,969
Price per m³*)	1.35	1.39	1.42	1.50	1.55	1.6	1.9

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

### 6.5 Waterways

Pursuant to Act No. 114/1995 Coll., on Inland Navigation, management of the development and modernization of waterways of importance to shipping is in the competence of the Ministry of Transport. This activity regards 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.

Under the "European Agreement on Main Inland Waterways of International Importance (AGN)" the E 20 main European waterway, on the Elbe and its branch E 20-06 on the Vltava River, is a waterway of international importance. As defined in Decision of the European Parliament and of the Council No. 661/2010/EU on the main trends of the European Union for the development of trans-European transport network, the entire Elbe waterway from the state border between the Czech Republic and Germany to Pardubice and the Vltava waterway from Mělník to Třebenice is included in the system TEN-T. From the Ústí nad Labem at Střekov hydraulic structure to Přelouč on the Elbe and to Třebenice on the Vltava River, navigability is ensured by a system of hydraulic structures constituting a fully operational traffic system, independent of outer natural conditions. Navigation traffic on the regulated stretch from Střekov down the stream to the state border CR/FRG depends, however, on water stages based on the current flows and on the overall water management situation in the entire Elbe and the Vltava River basins.

The funds spent in the field of the development and modernization of waterways with significance to transport amounted in the year 2011 to CZK 548.614 million in total. Programme development of waterways was funded by CZK 428.097 million allocated from the budget of the State Transport Infrastructure Fund, CZK 88.122 million from the EU funds in the Operational Programme Transport, CZK 17.423 million from the loan provided by the EIB and CZK 14.972 million from the EU TEN-T fund.

To ensure trouble-free navigation on the Elbe water way, the key point is the completion of the Děčín navigation dam. In terms of transport and ecology it can be stated that water transport is at the Europe-wide level a significantly supported mode of transport, thanks to its efficiency and environmental friendliness, very low accident rate and the use of surface waters, which are also aquatic ecosystems.

The preparation of this key hydraulic structure is in the process of environmental impact assessment, including the assessment of the impacts of this project on bird sites protected by European legislation, sites of community importance and System Natura 2000 species. The EIA process is in the regime of international assessment. The completed EIA documentation was submitted to the Ministry of the Environment on 24 August 2010, but after the initial assessment by the designated MoE reviewer and based on comments made, the documentation was returned for refinement. On 31 January 2011, the refined documentation was re-submitted to the Ministry of the Environment for assessment, which means a continuation of the process pursuant to the Act No. 100/2001 Coll., on environmental impact assessment, as amended.

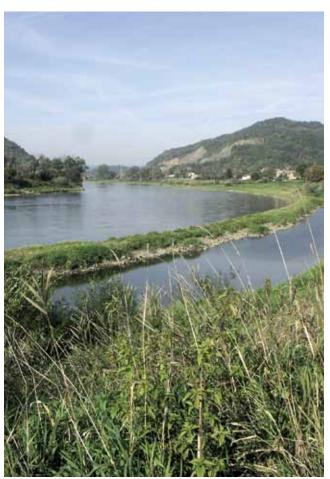
In the year 2011, significant amounts of funds were expended on large projects, such as the capital investment project Completion of the Vltava Waterway in the stretch between České Budějovice and Týn nad Vltavou, whose execution started in 2008 and will proceed until 2013. On 11 June 2011, within this set of capital investment project, an opening ceremony took place for the new 8.9 km long waterway between České Budějovice and Hluboká

nad Vltavou with the lock in České Vrbné. In 2011, within the above mentioned set of capital investment projects, construction of Lock Chamber in Hluboká nad Vltavou continued.

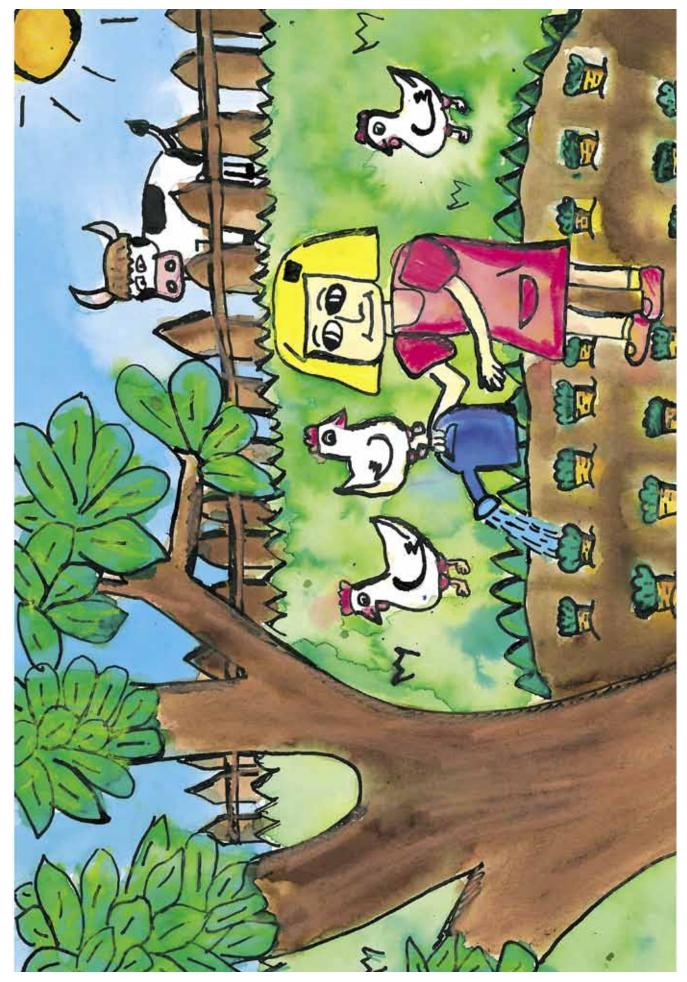
Another capital investment project, completed in 2011, was the Fuelling Site Štvanice. The aim of construction was to establish a site on the Vltava waterway in the area of the City of Prague that would be safe for refuelling and waste storage in ports, even in winter months. In the year 2011, also the modernization of lock chamber drives and controls at hydraulic structures in Veletov, Klavary, Kostomlátky and Nymburk was completed. The aim of the modernization was to improve safety and reliability of navigation traffic in lock chambers, thereby improving the reliability of navigation traffic on the Elbe waterway, while also improving the safety of the technology used at hydraulic structures with respect to the environment.

The projects that significantly contribute to the waterways traffic safety and passability include the Transmitter of Correction Signals DGPS, which since the end of 2009 transmits the data refining position information for advanced on-board navigation systems, and the Extension of River Information System under the project IRIS II, co-financed by the European Union from the TEN-T fund.

A preparation of other structures contributing to the development of waterways is under way. The strategic plans include, in addition to the Děčín navigation dam, especially the Přelouč II dam and making the river stretch navigable to Pardubice. A preparation continued in terms of extension of the Batův canal, securing of vertical clearance and increasing draughts on the Vltava waterway, in the port Hluboká nad Vltavou, in wharfs and port Petrov in the Batův canal, and finishing the modernization of lock chamber drives and controls on the Elbe, including modernization of lock chambers in Velký Osek and Brandýs nad Labem.



The Labe River in Těchlovice



Adéla Šimůnková – II years Dolákova primary school and nursery school, Prague

# 7. Public water supply and sewerage systems

## 7.1 Drinking water supply

In the year 2011 water supply systems supplied water to 9.8 million inhabitants in the Czech Republic, i.e. 93.4% of the total population.

All water supply systems produced in total 623.1 million m³ of drinking water. 486 million m³ of drinking water were supplied and charged for (invoiced), including 317.2 million m³ of drinking water for households. Drinking water losses amounted to 114.2 million m³, i.e. 18.5% of water intended for consumption.

The data provided by the Czech Statistical Office was collected on the basis of information provided by 1,338 reporting units (i.e. 277 water supply and sewerage system operators and a selected set of 1,061 municipalities operating the water management infrastructure on their own; the data was provided by 100% of both operators and municipalities). Primary data collected from the VH 8b-01 statements are not published by the Czech Statistical Office since 2004.

Trends and development of indicators in the field of drinking water supply are shown in table 7.1.1 and chart 7.1.1.

Table 7.1.1
Water supply from water supply systems in the years 1989 and 2005-2011

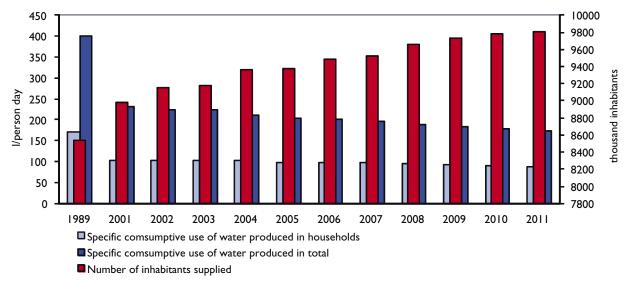
Indicator	Measurement unit	1989	2005	2006	2007	2008	2009	2010	2011
Inhabitants (mean)	thousand inhabitants	10,364.0	10,234.0	10,267.0	10,323.0	10,430.0	10,491.0	10,517.0	10,495.0
Inhabitants actually supplied with	thousand inhabitants	8,537.0	9,376.0	9,483.0	9,525.0	9,664.2	9,733.0	9,787.5	9,805.4
water from water supply systems	%	82.4	91.6	92.4	92.3	92.7	92.8	93.1	93.4
Water produced by water supply	million m³/year	1,251.0	699.0	699.0	683.0	667.1	653.3	641.8	623.1
systems	% as of 1989	100.0	55.9	55.9	54.6	53.3	52.2	51.3	49.8
Water invoiced in total	million m³/year	929.4	531.6	528.1	531.7	516.5	504.6	492.5	486.0
	% as of 1989	100.0	57.2	56.8	57.2	55.6	54.3	53.0	52.3
Specific consumptive use of water	l/person day	401.0	204.0	202.0	196.0	188.0	184.0	180.0	174.0
produced	% as of 1989	100.0	50.9	50.4	48.9	46.9	45.8	44.8	43.4
Specific quantity of water invoiced	l/person day	298.0	155.0	153.0	153.0	146.0	142.0	138.0	136.0
in total	% as of 1989	100.0	52.0	51.3	51.3	49.0	47.7	46.3	45.6
Specific quantity of water invoiced	I/person day	171.0	98.9	97.5	98.5	94.2	92.5	89.5	88.6
for households	% as of 1989	100.0	57.8	57.0	57.6	55.I	54.1	52.3	51.8
Water losses per 1 km of water mains	I/km day	16,842.0*)	5,770.0	5,673.0	4,893.0	4,889.0	4,705.0	4,673.0	4,220.0
Water losses per 1 inhabitant supplied	l/person day	90.0*)	43.0	42.0	36.0	37.0	35.0	35.0	32.0

Source: Czech Statistical Office

Note: \*) Data for water supply systems run by the main operators.

Chart 7.1.1

Development in the number of inhabitants supplied and the specific consumptive use of water invoiced in the years 1989 and 2001–2011



Source: Czech Statistical Office

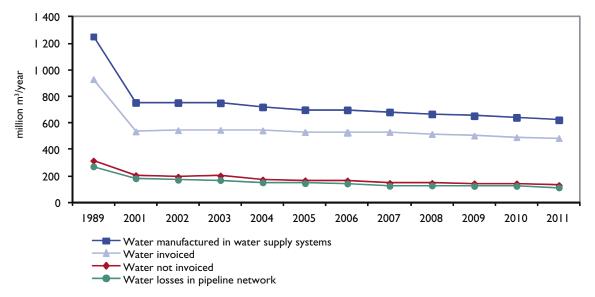
The increase in the percentage of inhabitants supplied with drinking water largely results from the construction of new water supply systems on the outskirts of towns. The 1.5% year-on-year decrease in the quantity of water produced corresponds to the simultaneous 0.7% decrease in the quantity of water invoiced. The specific quantity of water invoiced to households decreased by 0.9 litres per person and day and amounts to 88.6 litres. The specific quantity of water invoiced in total recalculated per one inhabitant supplied with water, decreased by 2.1 litres. This

indicates a continued decrease in consumption of households and other consumers.

The highest percentage of inhabitants supplied with drinking water from water supply systems in 2011 was recorded in the City of Prague (100%) and in the Moravskoslezský kraj region (99.9%), the lowest percentage of inhabitants supplied with drinking water was recorded in the Plzeňský kraj region (83.7%) and the Středočeský kraj region (84.5%).

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 2001–2011



Source: Czech Statistical Office

Table 7.1.2 Inhabitants supplied, production and supply of water from water supply systems in the year 2011

	Inhab	itants		Water	invoiced
Region	actually supplied with water from water supply systems	Percentage of inhabitants supplied with water of the total number	water produced in water supply systems	total	for households
	(number)	(%)	(thousand m³)	(thousand m³)	(thousand m³)
City of Prague	1,237,552	100.0	118,034	79,120	47,522
Středočeský kraj	1,075,243	84.5	46,495	49,756	35,031
Jihočeský kraj	575,155	90.5	34,101	25,965	17,989
Plzeňský kraj	478,264	83.7	29,679	24,436	14,567
Karlovarský kraj	302,664	99.7	20,680	14,867	9,309
Ústecký kraj	798,305	96.3	54,227	38,855	23,797
Liberecký kraj	389,260	88.9	28,134	19,903	12,284
Královéhradecký kraj	511,176	92.3	31,620	23,720	15,435
Pardubický kraj	498,887	96.6	29,339	23,012	14,737
Kraj Vysočina	484,223	94.6	25,326	21,532	14,101
Jihomoravský kraj	1,106,636	95.0	63,943	53,901	36,876
Olomoucký kraj	573,989	89.9	29,662	25,351	17,530
Zlínský kraj	543,075	92.1	29,771	23,680	15,567
Moravskoslezský kraj	1,230,936	99.9	82,048	61,921	42,418
Czech Republic	9,805,365	93.4	623,059	486,019	317,163

Source: Czech Statistical Office

As regards Jihočeský kraj, Královéhradecký kraj, Pardubický kraj and Olomoucký kraj regions, the percentage of inhabitants supplied with water slightly decreased in the year-on-year comparison with the total number. This decrease is only due to a higher precision of the methodology of calculating the number of inhabitants connected.

In 2011, the length of water supply network was extended by the total of 693 km and reached the length of 74,141 km. New construction of new water supply systems and completion of the existing ones thus increased in 2011 the number of inhabitants supplied by 17,890. The length of water supply network per one inhabitant supplied was 7.56 m.

The number of water supply connections increased by 18,651 and amounted to 1,974,607. The number of water meters installed increased by 17,681 and amounted to 1,982,978. The number of connected inhabitants per one water supply connection is 5.

Significant increasing in the number of connections is a result of people moving from multi-storey houses to family houses.

# 7.2 Discharge and treatment of municipal waste waters

In 2011, in total 8.672 million inhabitants in the Czech Republic lived in buildings connected to sewerage systems, which is 82.6% of the total population. In total 487.6 milion m³ of waste waters were discharged into sewerage systems. Of this quantity, 96.8% of waste waters were treated (excluding rain water), which amounts to 472.2 million m³.

Development trends of discharge and treatment of waste waters from sewerage systems shows in a longer time series table 7.2.1 and chart 7.2.1.

Table 7.2.1

Discharge and treatment of waste waters from sewerage systems in the years 1989 and 2005-2011

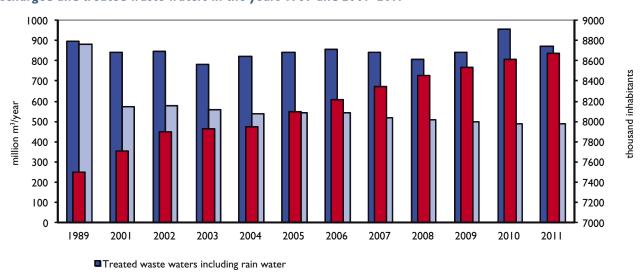
La Parker		Year							
Indicator	Measurement unit	1989	2005	2006	2007	2008	2009	2010	2011
Inhabitants (mean)	thousands of inhabitants	10,364	10,234	10,267	10,323	10,430	10,491	10,517	10,495
Inhabitants living in buildings connected to	thousands of inhabitants	7,501	8,099	8,215	8,344	8,459	8,530	8,613	8,672
sewerage systems	%	72.4	79.1	80.0	80.8	81.1	81.3	81.9	82.6
Waste waters discharged to	million m <sup>3</sup>	877.8	543.4	542.0	519.3	508.8	496.4	490.3	487.6
sewerage systems (excluding rain water) in total	% as of 1989	100.0	61.9	61.7	59.2	58.0	56.6	55.9	55.5
Treated waste waters including rain water 1)	million m³	897.4	841.5	857.4	841.2	807.5	842.9	957.9	871.0
Treated waste waters in	million m <sup>3</sup>	627.6	513.9	510.6	497.6	485.0	472.7	471.5	472.2
total excluding rain water	% as of 1989	100.0	82.0	81.4	79.4	77.3	75.4	75.2	75.3
Percentage of treated waste waters excluding rain water <sup>2)</sup>	%	71.5	94.6	94.2	95.8	95.3	95.2	96.2	96.8

Source: Czech Statistial Office

Note: 1) In the year 1989 the data relate to sewerage systems run by the main operators.

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 the years 1989 and 2001–2011



■Waste water dischraged to sewerage systems

■Number of inhabitants connested to sewerage systems

Source: Czech Statistical Office

<sup>&</sup>lt;sup>2)</sup> This percentage relates to waters discharged to sewerage systems.

The number of inhabitants connected to sewerage systems increased in the year-on-year comparison by 58,317. The quantity of waste waters discharged to sewerage systems, without rain water, decreased in the year-on-year comparison by 2.70 million m³, but the decrease in water supplied amounted to 6.52 million m³. The indicator of the percentage of the treated waste waters, without rain water, increased in the year 2011 by 0.6%.

The highest percentage of inhabitants connected to sewerage systems in 2011 was recorded in the City of Prague (100%) and the Karlovarský kraj region (93.3%), the lowest percentage was recorded in the Liberecký kraj region (68.9%) and the Středočeský kraj region (68.9%).

The number of inhabitants living in buildings connected to public sewerage systems increased in most of the regions, the decrease was recorded only in the City of Prague, in the Jihočeský kraj region and the Vysočina region. The reason for that is the decrease in the mean number of inhabitants. This decrease is most pronounced in the City of Prague due to people moving to the Středočeský kraj region.

In the year 2011, the sewerage network was extended by 1,009 km and reached the total length of 41,911 km. Based on the data provided by the Czech Statistical Office, the total number of waste water treatment plants in the Czech Republic increased in comparison with the previous year 2010 by 63 waste water treatment plants, i.e. to 2,251.

Table 7.2.2

Number of inhabitants living in buildings connected to sewerage systems and the quantity of discharged and treated waste waters in the year 2011 in the individual regions

	connected to p	ing in buildings oublic sewerage ems	Waste waters discharged to public sewerage systems		vaters excluding vater
Region	Percentage of the total number Total of inhabitants		Total	<b>P</b> ercentage	
	(number)	(%)	(thousand m <sup>3</sup> )	(thousand m³)	(%)
City of Prague	1,237,552	100.0	80,576	80,576	100.0
Středočeský kraj	876,575	68.9	52,925	52,523	99.2
Jihočeský kraj	548,266	86.2	35,689	33,655	94,3
Plzeňský kraj	449,444	78.7	30,479	28,897	94.8
Karlovarský kraj	283,156	93.3	14,853	14,793	99.6
Ústecký kraj	683,707	82.5	30,970	30,544	98.6
Liberecký kraj	301,947	68.9	14,610	14,533	99.5
Královéhradecký kraj	417,301	75.3	23,085	21,666	93.9
Pardubický kraj	372,361	72.1	21,319	20,282	95.I
Kraj Vysočina	435,992	85.2	19,650	16,908	86.0
Jihomoravský kraj	1,020,773	87.7	53,961	52,657	97.6
Olomoucký kraj	500,617	78.4	31,485	30,549	97.0
Zlínský kraj	530,808	90.0	28,231	26,636	94.4
Moravskoslezský kraj	1,013,061	82.2	49,812	47,964	96.3
Czech Republic	8,671,560	82.6	487,644	472,181	96.8

Souce: Czech Statistical Office



Hydraulic structure Všechlapy

# 7.3 Development of water and sewerage charges

Based on the survey carried out by the Czech Statistical Office, the average price of water rate excluding VAT in the year 2011 amounted to 30.80 CZK/m³ and the average price of sewerage charge to 27.90 CZK/m³. Compared to the year 2010, the price of water rate thus increased by 5.8% and the price of sewerage charge by 6.1%.

Prior to the Act No. 76/2006 Coll. coming into force, i.e. before 2006, the information on the average price of water rates and sewerage charges was based on the information sent upon request of the Ministry of Agriculture by selected operators of water supply and sewerage systems. Through the amendment to this act, the owners or, as the case may be, the operators if authorized by the owner, pursuant to the provision in Section 36, Subsection 5 of the Act on Public Water Supply and Sewerage Systems and on amendments to some laws, were imposed the obligation to send to the Ministry of Agriculture every year by 30 June at the latest full data on the total account of all items in the calculation of prices of water rates and sewerage charges in the previous calendar year. The data on prices collected by the

Ministry of Agriculture include VAT and are obtained through a weighted average. With regard to the deadline for submitting the account, these data cannot be evaluated and processed before the closing date of this publication. For this reason, this publication states only the data established by the Czech Statistical Office as the percentage of revenues from sales to the consumers and the quantity of the drinking water supplied and the sewage discharged. Aggregate data of the Czech Statistical Office for the Czech Republic are not obtained through a weighted average and cannot therefore be compared with the data collected by the Ministry of Agriculture.

Based on the survey carried out by the Czech Statistical Office, the highest average price of water rate was established in the Ústecký kraj region, where it reached the amount of CZK 35.70/m³. Compared to the national average this price was thus higher by 15.9%. The highest average price of sewerage charges was established in the Liberecký kraj region and in the amount of CZK 37.20/m³ exceeded the national average by 33.3%. On the contrary, the lowest average price of water rate (CZK 27.00/m³) was established in the Jihomoravský kraj region. The lowest average price of sewerage charges (CZK 21.60/m³) was established in the Vysočina region. Average prices in the respective regions are shown in table 7.3.2.

Table 7.3.1
Strike prices of water and sewerage charges in the years 2010 and 2011

Indicator	Unit	2010	2011	Index 2011/2010
Water rates in total	CZK million	14,328	14,975	1.05
Water invoiced in total	million m³/year	493	486	0.99
Average price of water rate	CZK/m³	29.1	30.8	1.06
Sewerage charges in total	CZK million	12,898	13,599	1.05
Waste waters discharged to sewerage systems	millin m³/year	490	488	1.00
Average price of sewerage charges	CZK/m³	26.3	27.9	1.06

Source: Czech Statistical Office

Table 7.3.2
Water consumption, average prices of water and sewerage charges excluding VAT in the year 2011

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
	(I/person/day)	(I/person/day)	(CZK/m³)	(CZK/m³)
City of Prague	175.2	105.2	31.3	28.0
Středočeský	126.8	89.3	33.7	24.9
Jihočeský	123.7	85.7	33.3	25.3
Plzeňský	140.0	83.4	31.0	23.8
Karlovarský	134.6	84.3	34.1	29.0
Ústecký	133.3	81.7	35.7	36.5
Liberecký	140.1	86.5	33.2	37.2
Královéhradecký	127.1	82.7	28.9	29.6
Pardubický	126.4	80.9	28.5	32.1
Vysočina	121.8	79.8	29.7	21.6
Jihomoravský	133.4	91.3	27.0	30.0
Olomoucký	121.0	83.7	28.6	25.4
Zlínský	119.5	78.5	32.0	27.5
Moravskoslezský	137.8	94.4	27.9	26.2
Czech Republic	135.8	88.6	30.8	27.9

Source: Czech Statistial Office



**Kateřina Motlová – 9 years** Elementary school of Art, Rokycany, Plzeňský kraj region

# 8. Fisheries and fishpond management

# 8.1 Fisheries and fishpond management in the year 2011

Fishery in the Czech Republic is divided in two basic areas. One of them includes production fishery and the other includes management in fishing districts. Fishery as such is part of agriculture and in terms of fish production it still belongs to successful areas of agricultural production. Fishery is also followed up by not negligible service sector, for example, manufacturers of various fishnet systems and other technical equipment and tools that are indispensable to this field of activity.

The next important factor which fishery is associated with, is management on running waters and support for the existence of fish species in surface waters, namely in streams and other water bodies. Superstructure works as a consequence of biological aspects of the function of management in fishing districts. Fishing and angling activities are carried out by approximately 400 thousand of registered recreational fishermen, who are largely organized in two biggest Fishing Associations (Czech Fishing Association, Moravian Fishing Association). In 2011, members of these two associations caught in total about 4 thousand tonnes of fish.

Recreational fishing is associated wih many other sectors. A number of manufacturing companies, stores selling fishing equipment and entrepreneurs in tourism are dependent on sales of their products to recreational fishermen.

Historically the most significant area of fishery with the irreplaceable landscaping function is fishpond management. In the Czech Republic, fish farming is carried out in approximately 24 thousand fishponds and water reservoirs with the retention capacity of 420 million m³, covering the total area of around 41 thousand hectares. The fishponds show annual average fish population growth amounting to approximately 490 kg fish/hectare. Representation of market fish species is fairly stable and has not changed compared to the previous years. The largest volume of fish produced by fish farming is accounted for by carp, followed by herbivorous fish (silver carp, grass carp), salmonids (in particular rainbow trout and brown trout), tench and predatory fish (pike, zander, catfish, eel). Representation of other fish species in fish farming is only marginal.

In 2011, market fish produced by fish farming reached in total 21,010 tonnes, which represented, compared to the year 2010, an increase by 2.9% (i.e. by 590 tonnes). More than 96% of production come from fishpond farming and the remaining percentage comes from fish breeding in special facilities or reservoirs. The quantity

Table 8.1.1

Overview of fish production for direct consumption in the years 2007–2011

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Indicator of production and consumption of fish	2007	2008	2009	2010	2011
Production in thousands of tonnes	20.40	20.40	20.10	20.42	21.01
Of that: export in thousands of tonnes	10.45	10.12	8.95	9.10	8.80
Catch in fishing districts in thousands of tonnes	4.30	4.16	4.10	3.99	4.00
Consumption per person in kg.year-1	1.38	1.32	1.37	1.41	1.47

Source: MoA and the Czech Fish Farmers Association



The Krejcar pond, the Chlumětínský stream

of processed freshwater fish represented 2,130 tonnes of live weight. The consumption of freshwater fish produced by fish breeding in 2011 reached the value of 1.089 kg/person/year. For the calculation of the total consumption of freshwater fish per I inhabitant in 2011 (not taking into account the weight of fish caught by recreational fishermen in fishing districts), population number of 10,504,203 as of 31 December 2011 was considered.

The total market fish production was traditionally dominated by carp, whose production in 2011 showed a year-on-year increase by 2.5%, i.e. by 452 tonnes of live weight fish to reach the amount of 18,198 tonnes of live weight fish. The supply of this fish species is balanced with both the domestic and foreign market requirements, as approximately half of the annual carp production is sold on the domestic market, largely as live fish.

Since 2003, in addition to fish produced by fish farming, also catch by fish-hooking has been included in the figures.

The entry of the Czech Republic into the EU extended the possibilities to obtain support for the fishery sector. At present, particularly the following support measures are used:

- National sectoral support measures relating to aquaculture and freshwater fishing: Yield Capacity Control, Special Consultancy for Animal Production, School Production Facilities, Support for Non-productive Fishpond Functions and Genetic Resources.
- 2) Operational Programme Fisheries 2007–2013: where fishermen may use the respective funds within Priority Axis 2 Aquaculture for investments into aquaculture production, equalization payments aimed at improving the aquatic environment, measures in the field of fish health and investments into fish processing and marketing. The subsidy within Priority Axis 3 Measures in the Common Interest relates to the development of new markets, promotion campaigns, reintroduction of eel (Anguilla anguilla) and pilot projects.

In 2011, the Ministry of Agriculture issued the decision to grant subsidies within Call 7, Call 8, Call 9 and Call 10 of accepting applications for subsidies from the Operational Programme Fisheries 2007–2013.

Under measure 2.1 Measure for Productive Investments into Aquaculture, in 2011 the decisions were issued to grant subsidies for 98 business plan projects a) with the aggregate subsidy amounting to approximately CZK 56.0 million, 13 business plan projects b) with the aggregate subsidy amounting to approximately CZK 7.0 million, 14 business plan projects c) with the aggregate subsidy amounting to approximately CZK 47.2 million, 5 business plan projects d) with the aggregate subsidy amounting to approximately CZK 1.3 million and 9 business plan projects e) with the aggregate subsidy amounting to approximately CZK 9.7 million. In total, under measure 2.1 in 2011 the decisions were issued to grant subsidies for 139 projects with the aggregate subsidy amounting to approximately CZK 121.2 million.

Under measure 2.2 Measure for the Protection of Aquatic Environment, in 2011 the decisions were issued to grant subsidies for 6 projects with the aggregate subsidy amounting to approximately CZK 0.6 million.

Under measure 2.4 Investments in Processing and Marketing, in 2011 the decisions were issued to grant subsidies for 13 projects with the aggregate subsidy amounting to approximately CZK 6.4 million.

Under measure 3.1 Common Activities, in 2011 the decisions were issued to grant subsidies for 6 business plan projects a) with the aggregate subsidy amounting to approximately CZK 5.6 million.

Under measure 3.2 Measures for the Protection and Development of Aquatic Animals and Plants, in 2011 the decisions were issued to grant subsidies for 45 business plan projects b) (Reintroduction of Eel) with the aggregate subsidy amounting to approximately CZK 12.7 million.



The Brda pond in Výčapy

Under measure 3.3 Support for the Development of New Markets and Promotion Campaigns, in 2010 the decisions were issued to grant subsidies for 6 business plan projects b) with the aggregate subsidy amounting to approximately CZK 1.5 million and for 1 business plan project e) with the total subsidy amounting to approximately CZK 0.5 million. In total, under measure 3.3 in 2011 the decisions were issued to grant subsidies for 7 projects with the aggregate subsidy amounting to approximately CZK 2.0 million.

Under measure 3.4 *Pilot projects*, in 2011 the decisions were issued to grant subsidies for 12 projects with the aggregate subsidy amounting to approximately CZK 12.4 million.

In 2011, the Ministry of Agriculture continued in the prefinancing of projects under the Operational Programme Fisheries 2007–2013. In 2011, under measure 2.1, subsidies in amount of CZK 99.6 million were disbursed for 146 projects. Under measure 2.4, subsidies in amount of CZK 10.0 million were disbursed for 10 projects. Under measure 3.1, subsidies in amount of CZK 0.6 million were disbursed for 3 projects. Under measure 3.2, subsidies in amount of CZK 12.3 million were disbursed for 46 projects. Under measure 3.3, subsidies in amount of CZK 81.8 million were disbursed for 4 projects. Under measure 3.4, subsidies in amount of CZK 10.4 million were disbursed for 11 projects. Under measure 5.1, subsidy in amount of CZK 3.1 million was disbursed for 1 project.

Table 8.1.2
Operational Programme Fisheries 2007–2013

Priority axis 2 – Aquaculture				
Number of measure	Name of measure			
Measure 2.1	Investments into productive aquaculture			
Measure 2.2	Protection of the aquatic environment			
Measure 2.3	Measures in the field of fish health			
Measure 2.4	Investments into processing and marketing			
Priority axis	Priority axis 3 – Measures in common interest			
Number of measure	Name of measure			
Measure 3.1	Common activities			
Measure 3.2	Measures for the protection and development of aquatic animals and plants			
	Support and development of new markets and			
Measure 3.3	promotion campaigns			

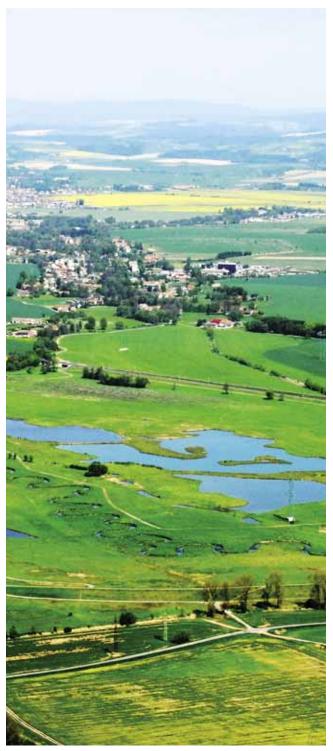
Source: MoA

# 8.2 Changes in the status of the fishpond system

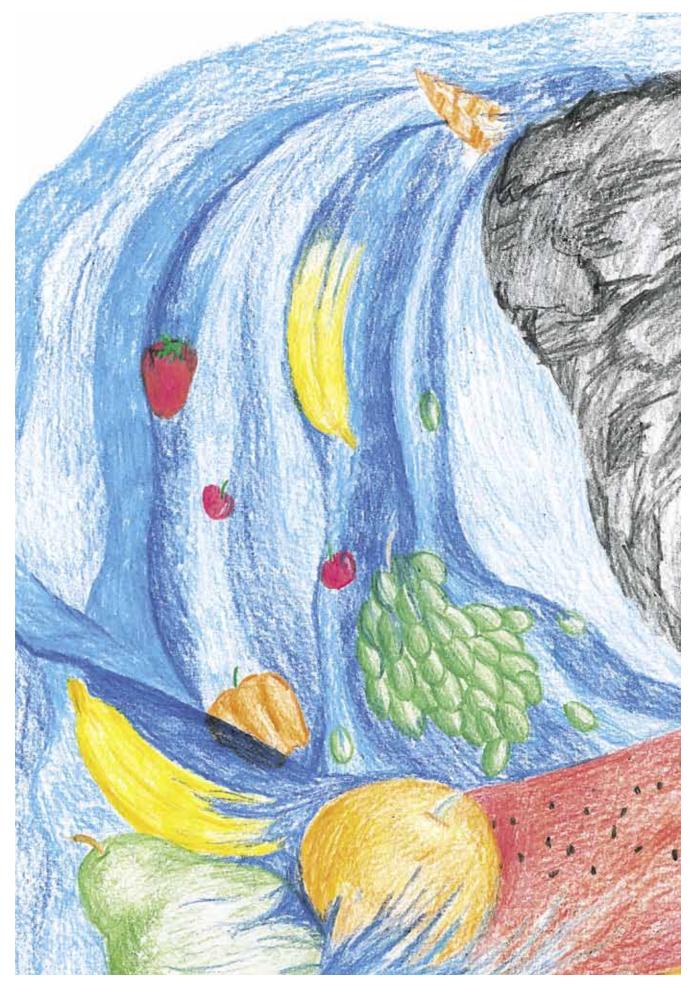
The programme of the Ministry of Agriculture 229 210 – "Renewal, Dredging and Rehabilitation of Fishponds and Reservoirs" aimed at the overall improvement of the technical status of the fishpond system and the strengthening of water management and non-productive functions of fishponds with regard to their flood control and landscaping importance has already ended.

Sub-programme 229 218 "Remedying of Damages to Fishponds and Reservoirs after Floods in August 2002" was followed in 2007 by sub-programme 129 130 "Support for Renewal,

Dredging and Rehabilitation of Fishponds and Construction of Reservoirs" which is implemented in a similar manner. Renewal and rehabilitation of fishponds and water reservoirs is aimed at improving their water management and non-productive functions. The focus is placed in particular on improving retention capacity. At the same time, attention is paid to improving operational safety of fishponds and reservoirs in connection with flood situations. The retention capacity is also supported by the continued dredging of the most silted ponds and it is also possible to support the construction of water reservoirs serving for flood control and protection against drought. Under sub-programme 129 130, in 2011 the funding of 64 projects was under way, with the total expenditures amounting to CZK 520.110 million. In more detail, the information on the sub-programme 129 130 funding is presented in chapter 9.



Polder Žichlínek, the Moravská Sázava River



**Monika Randisová – I I years** Primary school and nursery school in the hospital, Ústí nad Orlicí, Pardubický kraj region

# 9. State financial support for water management

## 9.1 Ministry of Agriculture

In 2011, the Ministry of Agriculture provided support amounting to the total of approximately CZK 2.2 billion under its programme 229 310 "Construction and Rehabilitation of Water Supply and Sewerage System Infrastructure" and programme 129 180 "Construction and Rehabilitation of Water Supply and Sewerage System Infrastructure II" aimed at implementation of measures to meet the directives of the EU in the field of water supply and sewerage systems and at the development of this sector. The programme 229 310, based on the approved documentation, was scheduled for the years 2006-2010 and extended until the end of 2011. In the years 2010-2011 this programme was involved in completing the co-financing of multi-year projects. The follow-up subsidy programme 129 180 is scheduled for the years 2009-2013.

The above support was granted to the investors both in the form of subsidies and in the form of "advantaged loans". In 2011, 121 projects received from the state budget support amounting to approximately CZK 477 million under sub-programmes 229 312 and 129 182 of the Ministry of Agriculture (measures aimed at water supply systems) and 156 projects were granted support amounting to approximately CZK 1,630 billion under sub-programmes 229 313 and 129 183 of the Ministry of Agriculture (measures aimed at sewerage systems).

In 2009, within the framework of support in the form of "advantaged loans" the remaining funds were drawn from the loan granted to the Czech Republic by the EIB based on the



Flood control measures in the Vltava River in Nové Ouholice and Veltrusy

loan contract called "the Czech Republic – framework loan for water management intended for rehabilitations, improvements, modernizations and extensions of water management systems in the Czech Republic", implemented on the basis of the Czech Government Resolution No. 1179 of 1999, and simultaneously from the loan granted by the CEB. These terminated loans were replaced, based on the agreement with the Ministry of Finance, by compensation of payments for a part of interest rates for commercial loans in case of projects requiring larger investments. In 2011, subjects investing into 88 projects with loan contracts amounting to approximately CZK 1,444 billion were reimbursed a part of interest on these loans in the total amount of CZK 31.8 million (this is a subsidy for a part of interest, therefore, this amount is included in tables 9.1.1 and 9.1.2 on the line "subsidy").

Table 9.1.1
State budget funds provided in the year 2011 under the programmes 229 310, 129 180 and 129 140 of the Ministry of Agriculture in millions of CZK

Form of support	Water supply systems and water treatment plants	Sewerage systems and waste water treatment plants	Renovation of water supply systems and sewerage systems after floods in 2009 and 2010	Ministry of Agriculture in total
Refundable financial assistance	0.000	0.000	0.000	0.000
Subsidy	477.021	1,629.975	86.538	2,193.534
Total	477.021	1,629.975	86.538	2,193.534

Source: MoA

Table 9.1.2

Development of the state support for construction of water supply systems, water treatment plants, sewerage systems and waste water treatment plants in the years 2007–2011, provided by the Ministry of Agriculture in millions of CZK

Financial resource	2007	2008	2009	2010	2011
Refundable financial assistance	0	0	0	0	0
State budget subsidy	1,620	1,947	1,819	2,092	2,194
Support from the state budget	1,620	1,947	1,819	2,092	2,194
Advantaged Ioan (EIB and CEB)	161	31	9	0	0
Support in total	1,781	1,978	1,828	2,092	2,194

Source: MoA

Under the programme 129 140 "Support for Remedying Flood Damage to Infrastructure of Water Supply and Sewerage Systems" the implementation of two sub-programmes in response to floods from the years 2009 and 2010 was under way in 2011. Under the sub-programme 129 142 "Support for Remedying Damages Caused by Floods 2009", in total 12 projects were granted support in the total amount of CZK 70.3 million in 2011, and under the sub-programme 129 143 "Support for Remedying Damages Caused by Floods 2010", in total 7 projects were granted support in the total amount of CZK 16.3 million in 2011.

In 2011, the Ministry of Agriculture implemented programmes aimed at rehabilitation of water management property

owned by watercourse administrators, within the process of remedying damages caused by floods in the previous years, as well as at the implementation of flood control measures, the renewal, dredging and rehabilitation of fishponds and water reservoirs, increasing the functionality and utility of hydraulic structures, the renewal and construction of irrigation detail and optimization of irrigation systems, and the management of state-owned property on minor watercourses and main drainage facilities.

The use of state funds for capital and current expenditures is shown in tables 9.1.3, 9.1.4 and 9.1.5.

Table 9.1.3

State funds provided by the Ministry of Agriculture in the year 2011 for capital and current expenditures under programme financing in programme 229 110 in millions of CZK

Programme identification number	Name of programme	Expenditures on programme financing
229 110	Remedying of the impacts of floods on state-owned water management property	352.452

Source: MoA

Table 9.1.4

State funds provided by the Ministry of Agriculture in the year 2011 for capital and current expenditures under programme financing in programmes 129 120, 129 130, 129 170 and 129 190 in millions of CZK

Programme identification number	Name of programme	Expenditures on programme financing
129 120	Flood prevention II	1,220.493
129 130	Renewal, dredging and rehabilitation of fishponds and water reservoirs	520.110
129 170	Support for increasing the functionality of hydraulic structures	134.397
129 190	Support for agricultural watercourses administered by Agricultural Water Management Administration	0

Source: MoA

Table 9.1.5

Non-investment support provided by the Ministry of Agriculture in the year 2011 for other measures in water management in millions of CZK

Name of support	Amount of funds provided	Beneficiary
Administration of main drainage facilities *)	28.150	Agricultural Water Management Administration

Source: MoA

Note: \*) Including operation and maintenance.

In 2011, the Ministry of Agriculture continued to administer the programme 129 120 "Support for Flood Prevention II", which from the year 2010 includes five sub-programmes thematically focusing on support for flood control measures with retention, support for flood control measures along watercourses, support for increasing the safety of hydraulic structures, support for delimitation of flood areas and studies of runoff conditions and support for water retention in dry polders on minor watercourses. Subject-oriented nature of these subprogrammes allows their mutual cohesion, augmenting thus the effects of flood prevention on the watercourse.

The subject matter of sub-programme 129 122 "Support for Flood Control Measures with Retention" is the construction and the renewal of polders, the construction and rehabilitation of water reservoirs, the restoration of the existing reservoirs and polders and also the construction and restoration of structures in areas designated for overflowing.

Sub-programme 129 123 "Support for Flood Control Measures along Watercourses" is aimed at increasing channel capacity of watercourses, flood banks, flood ways and diversion tunnels, increasing the flow capacity of weirs, rehabilitation of dams and stabilization of watercourse channels.

The objective of sub-programme 129 124 "Support for Increasing the Safety of Hydraulic Structures" is the rehabilitation of the existing hydraulic structures to improve their safety during floods and to increase the operating potential of hydraulic structures in operational flood management. Priority measures are those that may increase the effect of other flood control measures downstream the respective hydraulic structure.

Sub-programme 129 125 "Support for Delimitation of Flood Areas and Studies of Runoff Conditions" is in particular aimed at identification of the extent of floods and plotting this extent to maps. This sub-programmes also includes the delimitation of areas exposed to threat of special floods caused by a failure of

hydraulic structure or a dam break of reservoirs impounding surface water. The defined flood areas, approved by the water authority, are one of the land use limits and are used by the public administration bodies particularly in issuing building permits. The studies of runoff conditions are sources of information on flood areas prior to and after the implementation of the proposed flood control measures, on the quantification of the extent of flood damages and evaluation of the effectiveness of the proposed technical and non-technical measures.

Sub-programme 129 126 "Support for Water Retention in Dry Polders on Minor Watercourses" responds to the repeating occurrences of "flash floods" and focuses on reducing risks of floods from torrential rains on minor watercourses through a construction (reconstruction) of dry polders in combination with the possible regulation of watercourse channels.

The measures under the programme 129 120 are implemented by watercourse administrators (the River Boards, state enterprises, the Forests of the Czech Republic, s.e. and the minor watercourse administrators appointed by the Ministry of Agriculture pursuant to Section 48, Subsection 2 of the Act No. 254/2001 Coll., on Water and the amendment to certain laws (the Water Act) as amended. The implementation of flood control measures under the sub-programme 129 126 is ensured by municipalities only.

Through the institution of the so-called promoter, the programme allows participation of municipalities, association of municipalities, towns and regions in the process of proposing flood control measures which are then implemented by the watercourse administrators.

In 2011, the total number of projects in progress under the programme 129 120 "Support for Flood Prevention II" included 7 projects of flood control measures with retention, 85 projects of flood control measures along watercourses, 9 projects aimed at increasing the safety of hydraulic structures and 5 projects of the delimitation of flood areas and studies of runoff conditions. The following table 9.1.6 shows some of the major projects under the programme 129 120.



Hydraulic structure Římov

Table 9.1.6
Use of funds for selected major projects under the programme 129 120 "Support for Flood Prevention II" in millions of CZK

Watercourse administrators	Name of project		Total costs	Subsidies in 2011
Forests of the Czech Republic, s. e.	Flood control measures on the Žernovník stream 10/10-06/1		11.390	9.000
Elbe River Board, s. e.	Lovosice area (Pišťany, Lovosice) – flood control measures against Q100 on the Elbe	04/10-06/13	649.809	286.223
Morava River Board, s. e.	The Třebůvka River, Moravičany – damming	10/10-12/13	130.341	109.920
Oder River Board, s. e.	The Porubka River regulation, Ostrava – Svinov km 0.900-7.200	07/09-03/12	85.816	20.327
Ohře River Board, s. e.	Bohušovice nad Ohří – flood control measures	06/11-12/13	60.680	7.600
Vltav River Board, s. e.	Flood control measures for the protection of Strakonice	06/11-04/13	80.000	26.705

Source: MoA

Table 9.1.7
Use of state budget funds in the year 2011 under the programme 129 120 by the individual watercourse administrators in millions of CZK

Owners and administrators	Use of funds in 2011			
C where and administrations	Investments	Non-investments		
Elbe River Board, s. e.	515.329	0.000		
Vltava River Board, s. e.	79.954	0.000		
Ohře River Board, s. e.	37.111	0.000		
Oder River Board, s. e.	128.556	0.000		
Morava River Board, s. e.	368.496	4.694		
Forests of the Czech Republic, s. e.	82.357	0.000		
Minor watercourse administrators – municipalities	3.996	0.000		
Total	1,215.799	4.694		

Source: MoA

In 2011, the Ministry of Agriculture continued to implement the programme 229 IIO aimed at the rehabilitation of state-owned water management property administered by watercourse administrators, which was damaged by floods in the previous years. The rehabilitation is carried out in the year 2011 through the implementation of the sub-programme 229 II6 "Remedying of the Impacts of Floods in the Year 2009" and the sub-programme 229 II7 "Remedying of the Impacts of Floods in the Year 2010".

In 2011, under the sub-programme 229 116, financial support was granted to 81 projects. Most of them, 48 projects, were implemented by the watercourse administrator Forests of the Czech Republic, s. e. Table 9.1.8 shows some of the major projects under this sub-programme.



Flood control measures of Strakonice

Table 9.1.8

Summary of costs of selected major projects under the sub-programme 229 116 "Remedying of the Impacts of Floods in the Year 2009" in millions of CZK

EDS/SMVS 229116	Name of project	Implementation period	Total costs of the project	Investor
1002	Remediation of flood damage on the Bystrá stream – reconstruction of stream channel downstream of the fire brigade building in Nový Oldřichov (km 16.000 – 16.950)	01/11-11/11	14.881	Ohře River Board, s. e.
1010	Remediation of flood damage on the Bystrá stream – repair of stream channel in Nový Oldřichov (km 16.950 – 17.770)	03/11-11/11	3.854	Ohře River Board, s. e.
2119	The Vojtovický stream in km 15.05 – 17.30	09/10-05/12	12.930	Forests of the Czech Republic, s. e.
2122	The Lánský stream in km 4.735 – 7.700, stage l	11/10-12/11	13.674	Forests of the Czech Republic, s. e.
5672	Nameless left-hand tributary of the SedInice stream km 0.000 – 1.100	01/11-12/11	5.683	Oder River Board, s. e.
5671	The SedInice stream km 18.040 – 20.270	11/10-12/11	34.521	Oder River Board, s. e.
5807	The Lichnovský stream km 3.950 – 5.800, cadastral territory of Bordovice	09/10-12/11	2.640	Oder River Board, s. e.
6004	Hydraulic structure Lovosice, dredging of sediments, river km 786.5 – 787.4	06/10-12/11	17.598	Elbe River Board, s. e.
9807	The Loučský stream – flood damage 2009	06/10-11/11	3.699	Morava River Board, s. e.

Source: MoA

Table 9.1.9
Use of state budget funds in the year 2011 under the sub-programme 229 116 in millions of CZK

Owners	Use of funds in 2011		
and administrators	Investments	Non- investments	
Elbe River Board, s. e.	0.000	3.132	
Vltava River Board, s. e.	0.000	0.000	
Ohře River Board, s. e.	17.486	2.710	
Oder River Board, s. e.	46.633	12.813	
Morava River Board, s. e.	3.645	2.738	
Forests of the Czech Republic, s. e.	27.508	17.056	
Total	95.272	38.449	

Source: MoA

In 2011, under the sub-programme 229 117, financial support was granted to 190 projects. Most of them, 57 projects, were implemented by the watercourse administrator Forests of the Czech Republic, s. e. The following table 9.1.10 shows some of the major projects under this sub-programme.



Hydraulic structure Labská, the Labe River

Table 9.1.10
Summary of costs of selected major projects under the sub-programme 229 117 "Remedying of the Impacts of Floods in the Year 2010" in millions of CZK

EDS/SMVS 229117	Name of project	Implementation period	Total costs of the project	Investor
1021	Remediation of flood damage 08/2010 – the Fojtovický stream, repair of stream channel in Heřmanov	03/11-11/12	9.942	Ohře River Board, s. e.
2101	Left-hand tributary of the Jičínka River in km 20.940	11/10-12/11	4.000	Forests of the Czech Republic, s. e.
2150	The Satina River km 3.350	11/10-12/11	3.034	Forests of the Czech Repubnlic, s. e.
4005	The Lužnice River, river km 116.900 – 117.022, Majdalena – repair of bank lining	08/11-11/11	2.388	VItava River Board, s. e.
5808	The Olše River km 19.100 – 19.800	09/11-12/11	4.198	Oder River Board, s. e.
5851	The Vendryňka River and left bank of the Vendryňka River, river km 0.600 – 2.800; 0.000 – 1.200	08/11-12/11	2.723	Oder River Board, s. e.
6040	The Černá Nisa River, Liberec, repair of channel, river km 0.00 – 7.15	11/11-12/11	6.429	Elbe River Board, s. e.
6044	Fojtka, hydraulic structure Fojtka, renovation of hydraulic structure	07/11-12/11	6.230	Elbe River Board, s. e.
9717	The Bečva River, repair of dike and remediation of left bank, Přerov and Kozlovice km 13.574 – 13.770 and 14.940 – 16.070	09/11-12/11	1.966	Morava River Board, s. e.
9692	The Rožnovská Bečva River, km 8.290, Zašovský weir – repair	08/11-12/11	4.148	Morava River Board, s. e.

Source: MoA

Table 9.1.11
Use of state budget funds in the year 2011 under the sub-programme 229 117 in millions of CZK

Owners and administrators	Use of funds in 2011		
	Investments	Non-investments	
Elbe River Board, s. e.	30.475	52.403	
Vltava River Board, s. e.	0.000	5.249	
Ohře River Board, s. e.	9.831	20.892	
Oder River Board, s. e.	3.916	42.974	
Morava River Board, s. e.	0.316	32.755	
Forests of the Czech Republic, s. e.	8.544	11.376	
Total	52.082	165.649	

Source: MoA

In 2011, the Ministry of Agriculture continued to implement the programme 129 130 "Renewal, Dredging and Rehabilitation of Fishponds and Construction of Water Reservoirs".

The administration of the programme 129 130 was in the beginning postponed due to certain changes in the notification deadline and the consequent delays in the process of approving the programme documentation. For this reason, the funding of this programme effectively began as late as in the year 2008.

The objective of this programme is to improve the technical status of fishpond system in the Czech Republic and to renew the water management functions of fishponds and water reservoirs with focus on increasing their safety during floods, including the prevention of the threat of special floods, as well as to dredge fishponds and water reservoirs in order to restore their storage

capacity and thus fully renew their function. Another objective of this programme is to support construction of new water reservoirs that will be included in flood control system, in dry periods used for controlled increase of discharge and, at the same time, they will also be used for extensive fish farming. Both objectives of the programme are aimed at reducing the impacts of extreme hydrological situations, i.e. floods and drought.

In 2011, in total 64 projects were financed under the following breakdown: non-capital investment funds of the state budget were expended in the amount of CZK 14.999 million and capital investment funds in the amount of CZK 45.999 million, the EIB loan was used to draw non-investment funds in amount of CZK 269.556 million and capital investment funds in amount of CZK 189.556 million.

"Binding Rules" governing the submitting of project applications to be included in the programme 129 130 "Support for the Renewal, Dredging and Rehabilitation of Fishponds and Construction of Water Reservoirs" stipulate detailed terms, of which the most important are:

The applicant may only be an entity carrying out business in primary agricultural production, carrying out subsidized fish farming and fishing operations in a fishpond or water reservoir, which proves farming on more than 20 hectares of water bodies in the course of the last year and submits documents certifying the ownership, lease or other legal relationship in respect of 20 hectares of water bodies.

For the prepared project, the applicant shall submit the documents of ownership (lease or other legal relationship) of the land affected by the construction, the affirmative standpoints of the river basin administrator (River Board, state enterprise), of the administrator of the watercourse downstream of the respective hydraulic structure, and of the competent water authority having subject-matter and local jurisdiction.

In case of construction of a new water reservoir (or a system of water reservoirs), which must be larger than 2 hectares, the

Table 9.1.12
Use of state budget funds for selected major projects under the programme 129 130 "Renewal, Dredging and Rehabilitation of Fishponds and Construction of Water Reservoirs", in millions of CZK

Applicant	Name of project	Implementation period	Total costs	Subsidies in 2011
Kinský Žďár, a.s.	Renewal and reconstruction of the Velké Dářko pond structures	07/11-08/12	25.200	19.039
Czech Agricultural University in Prague	Rehabilitation of the Vyžlovský pond in the cadastral territory of Vyžlovka	11/11-12/12	5.080	1.900
Rybářství Třeboň a.s.	Reconstruction of the Vitek pond structures in the cadastral territory of Stará Hlína	11/10-02/12	20.428	16.341
Moravský rybářský svaz, místní organizace Vyškov	The desilting and rehabilitation of water reservoir Kačenec II	07/11-04/12	18.532	14.291
František Švehla	Construction of water reservoir Křivohlav	06/11-06/12	20.381	14.400

Source: MoA

main purpose of such hydraulic structure will be the protection against floods and drought, i.e. only extensive fish farming will be permitted. Table 9.1.12 shows some of the major projects included in the programme 129 130.

Sub-programme 129 162 "Support for the Renewal and Construction of Irrigation Detail and Optimization of Irrigation Systems"

In 2011, the sub-programme 129 162 was not opened due to lack of financial resources under the programme 129 160.

In 2011, the Ministry of Agriculture continued to implement the programme 129 170 "Support for Improving the Functionality of Hydraulic Structures".

The primary objective of the programme is to ensure, in particular, the following: to prevent major failures of the hydraulic structures, in respect of their technical condition and improvements in the quality of water in reservoirs. The main aspects include the reliability and safety of hydraulic structures and the quality of water in reservoirs, the deterioration of which might have significant impacts.

The subject-matter objectives of the programme are supported by rich experience in coherent and systematic technical and safety surveillance of hydraulic structures and water quality monitoring in the reservoirs. The programme focuses, in particular, on implementation of measures aiming to remedy the condition of the most threat-posing hydraulic structures.

The programme objectives are oriented at improving the functionality of the impounding structure itself and the dam, at accessories and service structures, and also at the reservoir area and the quality of accumulated water.

The programme does not include measures for fishponds and certain measures to improve the safety which are covered by another subsidy tools.

In 2011, three projects falling within the Morava River Board, s. e. were granted financial support in the amount of CZK 6.591 million of capital investment funds and CZK 127.805 million of non-capital investment funds under the programme 129 170. In total, the amount of CZK 134.397 million was used.

Programme 129 190 "Support for Agricultural Watercourses" - Agricultural Water Management Administration

The programme follows up with the sub-programme 229 013 and includes expenditures on purchase and technical renovation of state-owned property administered by the Ministry of Agriculture, namely by its organizational unit – Agricultural Water Management Administration.

The programme is constituted by three sub-programmes:

129 192 "Preparation of projects under the Operational Programme Environment",

129 193 "Rehabilitation of Watercourses and New Adaptations of Watercourses".

129 194 "Restoration of Water Reservoirs".

In 2011, no state budget funds were released for the programme 129 190.

State funds are also provided for other measures in water management pursuant to Section 102, Subsection I letters b), i), k) of the Water Act. This support is of non-investment nature and is provided for current expenditures of the specific indicator "Support for water management in total" in the budget chapter of the Ministry of Agriculture for maintenance of minor water courses, water reservoirs and polders and related structures, as well as for maintenance and operation of main drainage facilities.

Maintenance of minor watercourses, water reservoirs and polders

In 2011, no state budget funds were released for this purpose.

Operation of minor watercourses, water reservoirs and polders and related structures

In 2011, no state budget funds were released for this purpose.

### Maintenance of main drainage facilities

In 2011, the non-capital investment funds of the state budget expended within the framework of this support, i.e. for maintenance, repairs and management of the state-owned property on main drainage facilities and related structures administered by the Agricultural Water Management Administration amounted to CZK 14.763 million. In total 161 non-capital investment projects (including 24 immediate interventions) were executed and completed and maintenance was carried out for 287.83 km of main drainage facilities.

### Operation of main drainage facilities

In 2011, the non-capital investment funds of the state budget in the amount of CZK 14.266 million were expended within the framework of this support to cover operating costs of I12 projects of main drainage facilities administered by the Agricultural Water Management Administration

### 9.2 Ministry of the Environment

## 9.2.1 Financial support provided under the programmes co-financed from the EU funds

#### **Operational Programme Environment**

The Operational Programme Environment is a sectoral operational programme for the programming period 2007–2013, which was approved on 20 December 2007. The funds started to be used in September 2008. The aim of the operational programme is the protection and improvement of the quality of the environment as a basic principle for sustainable development. The Operational Programme Environment is divided into a total of eight priority axes:

- I. Water Management Infrastructure Improvements and a Reduction of Flood Risks,
- 2. Air Quality Improvements and a Reduction of Emissions of Pollutants,
- 3. Sustainable Use of Energy Sources,
- Improved Waste Management and Rehabilitation of Contaminated Sites,
- 5. Reducing of Industrial Pollution and Environmental Risks,
- 6. Improving the State of Nature and the Landscape,
- Infrastructure Development for Environmental Education, Consultancy and Awareness,
- 8. Technical Assistance.

The Operational Programme Environment is managed and guaranteed by the Ministry of the Environment, the Intermediate Body is the State Environmental Fund of the Czech Republic. The applications for support are received by regional offices of the State Environmental Fund of the Czech Republic, those submitted under the priority axis 6 and under the intervention area 1.3.2

are also received by the Agency for Nature Conservation and Landscape Protection of the Czech Republic. Dates for submitting the applications are published in the form of Calls on the portal www.opzp.cz. For the year 2011, the receipt of applications for the granting of support under the Operational Programme Environment was opened within one Call with focus on flood protection and implementation of measures aiming to execute river basin management plans. Under the priority axis 1 – Water Management Infrastructure Improvements and a Reduction of Flood Risks, the ERDF/CF funds in the total amount of CZK 5,546 million were used in 2011. Under the priority axis 6 – Improving the State of Nature and the Landscape (area of intervention 6.4 – Optimization of the Landscape Water Regime), the ERDF/CF funds in the total amount of CZK 663.6 million were used in 2011.

Under the Operational Programme Environment, the priority axis I - Water Management Infrastructure Improvements and a Reduction of Flood Risks, the Ministry of the Environment in 2011 approved 13 projects (registration sheet issued), of which 2 projects fell under the area of intervention I.I The Reduction of Water Pollution (the total support from the EU funds amounted to CZK 953.3 million), 10 projects fell under the area of intervention 1.2 Drinking Water Quality Improvement (the total support from the EU funds amounted to CZK 846.3 million) and I project fell under the area of intervention 1.3 The Reduction of Flood Risks (the total support from the EU funds amounted to CZK 19.8 million). In 2011, no so-called large projects were approved, but the EC issued a decision for two water management projects approved at a national level in previous years. Under the OPE, priority axis 6 - Improving the State of Nature and the Landscape, the Ministry of the Environment in 2011 approved 66 projects (registration sheet issued) falling under the area of intervention 6.4 - Optimization of the Landscape Water Regime (the total support from the EU funds amounted to CZK 269.8 million).

Table 9.2.1.1

Grant funds from the Operational Programme Environment for the financing of measures in the area of water management in 2011

area of support	number of approved projects	total costs of approved projects (millions of CZK)	total amount of the EU support for approved projects (millions of CZK)	reimbursed by the EU *) (millions of CZK)	reimbursed from the State Environmental Fund/state budget in total (millions of CZK)
1.1	2	1,476.3	953.3	5,387.2	331.2
1.2	10	1,473.6	846.3	26.2	1.5
1.3	1	23.3	19.8	132.6	7.8
Priority axis I in total	13	2,973.2	1,819.4	5,546.0	340.5
6.4	66	408.9	269.8	663.6	73.4
Total	79	3,382.1	2,089.2	6,209.6	413.9

Source: MoE

Note: "State budget funds expended on the pre-financing of expenditures that are to be covered from the ERDF/CF funds

### Support under ISPA and Cohesion Fund

Based on the Government Resolution No. 149 of 14 February 2001, the Ministry of the Environment of the Czech Republic was established the Intermediate Body and the State Environmental Fund of the Czech Republic the implementing agency for the implementation of ISPA projects. The pre-accession instrument ISPA was designed for sectors of transport and environment in EU candidate countries. Through the accession to the EU on I May 2004 the Czech Republic was entitled to draw subsidies from the Cohesion Fund. Based on the Government Resolution No. 125/2004, the Ministry of the Environment of the Czech Republic was established the Intermediate Body and the State Environmental Fund of the Czech Republic the Implementing Body for the implementation of Cohesion Fund projects in the area of the environment. Due to the fact that as of the day of accession of the Czech Republic to the EU none of ISPA projects

was completed, these projects were transferred to the Cohesion Fund projects, pursuant to Art. 16a of the Council Regulation (EC) No. 1164/94. In total 106 projects applying for support under ISPA programme and CF were registered by the State Environmental Fund of the Czech Republic. As of 31 December 2006, of the total number of 106 projects, the European Commission approved 40 projects, of which 39 focused on the implementation of measures in the area of water management.

The eligible costs for 39 approved projects amount to € 800.1 million. The CF/ISPA support allocated for these projects amounts to € 565.6 million. The above mentioned projects also include a project of remediation of flood damage (comprising 13 sub-projects which were supported from ISPA fund), a non-investment project of Technical Assistance and also a project in the field of the hydrosphere monitoring (see table 9.2.1.2).

Table 9.2.1.2

The allocation of funds for types of measures (approved CF/ISPA projects) in millions of €

Type of measure	Number of projects	Eligible costs	CF/ISPA support
water	36	763.2	536.6
monitoring of hydrosphere	1	16.9	12.7
Technical Assistance	-	2.3	1.7
floods ISPA 2002	I (13 sub-projects)	17.7	14.6
Total	39	800.1	565.6

Souce: MoE

In 2011, support was granted for 4 CF/ISPA projects. Since 2006, the granting of funds for the final beneficiaries has been proceeding in the form of a so-called pre-financing, i.e. through effecting payments from the state budget funds for the cofinancing and pre-financing of expenditures that are to be covered from the CF funds. In the sector of environment, the payments for CF projects are effected through the chapter 315/MoE of the state budget. In 2011, support in the total amount of CZK 303.4 million was transferred from the state budget to the final beneficiaries. Approximately 20 projects in 2011 had the so-called final report of the project to the EC submitted. The approval of this final report is bound to the release of the final payment from the EU grant funds in the amount of 20% of the total grant provided.

Table 9.2.1.3
Summary of financial support provided under the national programmes of the Ministry of the Environment and programmes co-financed from the EU funds

Grant funds for the Ministry of the Environment in total	millions of CZK	
National grant titles	20.60	
Operational Programme Environment	6,623.50	
ISPA / CF	303.40	
State Environmental Fund*)	413.90	
Total	7,361.40	

Note:  $^{9}$  Support provided to the applicants from the SEF funds in the form of loans is not included in the table above.

### 9.3 The State Environmental Fund

The State Environmental Fund of the Czech Republic 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 compartments.

The revenues of the State Environmental Fund of the Czech Republic include collected charges for environmental pollution. In the area of the protection of waters they comprise a charge for waste water discharges into surface waters and a charge for abstracted groundwater quantities. The collection of charges for waste water discharges into surface waters in the year 2011 reached 119% of the budgeted revenues. This exceedance of the budgeted revenues was caused, despite the remaining low production in industrial sectors affected by recession, especially by enhanced inspection activities of the State Environmental Fund staff members in cooperation with control laboratories and measuring groups of the selected providers of these services (monitoring) in close cooperation with the Czech Environmental



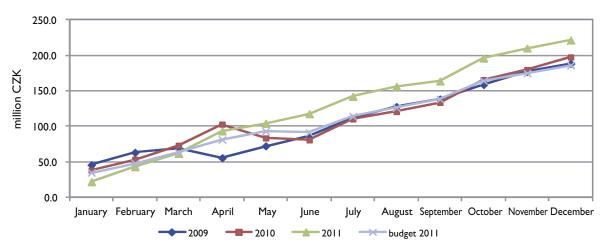
Hydraulic structure Kamenička

Inspection. These positive results were achieved despite the fact that many organizations still make use of the legal opportunity to defer payments of charges due to investments to waste water treatment plants, where the current legal regulations are relatively very benevolent, allowing even to fully forgive these deferred charges.

The chart below documenting the collection of charges for abstracted groundwater quantities in 2011 shows a similar trend as in the previous year. The revenues from charges reached the value of 137.7% of the planned annual revenues. It is evident that very positive results were achieved, in particular, due to permanent intensive controls performed in the recent three years by the State Environmental Fund staff members in close cooperation with the Czech Environmental Inspection. A slight but steady decrease in the revenues for abstracted water quantities was managed to be eliminated by this measure. Given the drastic reduction in the number of experienced inspectors due to a reorganization performed in late 2010, however, it can be assumed with a high degree of probability that the established trend of successful collection of charges will fail to be maintained in the coming years and repeated avoidances from the obligation to pay charges will occur again. Also legislative proposals to amend the current legislation, prepared by the State Environmental Fund of the Czech Republic, which would allow, among other things, to reduce losses of funds and stabilize revenues in this area, have not yet been accepted by the competent authorities and submitted to the government and the legislative councils. The development of revenues from both charges is shown in charts 9.3.1 and 9.3.2.

Chart 9.3.1

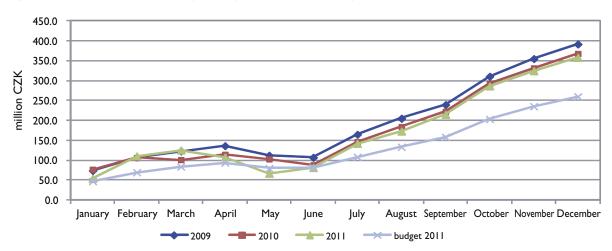
Development of revenues from charges for waste water in the years 2009–2011 in millions of CZK



Source: The State Environmental Fund of the Czech Republic

Chart 9.3.2

Development of revenues from charges for groundwater in the years 2009–2011 in millions of CZK



Source: The State Environmental Fund of the Czech Republic

The State Environmental Fund provides support from its resources under the so-called national programmes and carries out the activities which were delegated to it for administration of funds granted from the EU for the area of the environment. The State Environmental Fund of the Czech Republic was appointed the Implementing Body for the Cohesion Fund and the Intermediate Body for the Operational Programme Environment. To co-finance projects supported under the Cohesion Fund, the Operational Programme Infrastructure and the Operational Programme Environment, the State Environmental Fund provides financial grants from its resources.

Grant funds provided by the State Environmental Fund of the Czech Republic pursuant to MoE Directive 6/2010, on the provision of funds from the SEF under the national programmes

In 2011, in the area of water protection under the national programmes, the following programmes were announced by the State Environmental Fund of the Czech Republic:

 sub-programme IV.2.D Waste Water Treatment under the Programme of Support for Municipalities Located in the Regions of National Parks,

- sub-programme IV.4 The Increase in Support from the SEF in Co-financing OPE Projects after two completed Calls to submit applications for support it can be stated that the overwhelming majority of projects (except for 2 submitted projects) under this sub-programme are projects in the field of water management infrastructure (18 projects, of that 16 approved),
- V.I Support Programme to Ensure Comprehensive Monitoring of Water Status in the Czech Republic,
- V.2 Support Programme to Ensure Monitoring of Waters.

In 2011, based on approved projects under the above-mentioned support programmes, the area of water protection received grants in the total amount of CZK 31.8 million (of that CZK 13.8 million on the basis of the minister's exemption for the Municipality of Klec). As regards approved projects, liabilities in the total amount of CZK 22.8 million (of that CZK 18.7 million for the sub-programme IV.4 The Increase in Support from the SEF in Co-financing OPE Projects) are transferred to the year 2012.

In 2011, under support programmes for water protection, no Call to submit applications for support was announced, only Call



The Labe River in Klášterská Lhota

2 pursuant to Annex IV of the MoE Directive No. 6/2010 was coming to the end. Under this Annex IV, in the area of water protection, only one application for support for household waste water treatment plant in the amount of CZK 151.000 (included in the above-mentioned liabilities) was submitted.

In addition, under the national programmes, the completion of previously approved funding of projects in already closed programmes is under way.

# 9.4 Financial support from international cooperation and the EU

Projects focusing on the area of water management are also implemented under the Objective 3 programmes. The implementation of water management projects continued also in 2011, especially through the individual operational programmes falling under the Objective 3 of the European Territorial Cooperation. Control of these projects was entrusted to the Centre for Regional Development of the Czech Republic, which performs it through a network of offices in NUTS II regions. The offices store the project documentation, including documents on provided and used support from the foreign resources.

Under the Objective 3 programmes that are represented by Operational Programmes of Cross-border Cooperation Czech Republic – Republic of Poland, Slovak Republic – Czech Republic, Austria – Czech Republic, Free State of Saxony – Czech Republic and Free State of Bavaria – Czech Republic, support continues to be granted for the projects focusing on environmental protection, contributing to environmental status improvements and aiming to prevent risks (natural and technological risks including climate change, water management, etc.). Transnational Cooperation Operational Programme for Central Europe focuses, among other things, in the 2007–2013 programming period also on transfer and exchange of experience in the field of environmental protection.

## During 2011, projects launched this year or in previous years continued to be implemented.

- I. Operational Programme of Cross-border Cooperation between Austria and the Czech Republic in the field of environmental protection is represented mainly by the following projects:
  - "Research of self-purification processes in minor heavily degraded watercourses in the area of Weinviertel and South Moravia: – the development of the methodology for sustainable measures to improve the quality of waters" (the ERDF support in the amount of 83.650 € for the Czech partner). The execution of this project was completed as at 31 December 2011.
- "Flood forecasting system for the Morava River the Dyje River" (with a grant in the amount of 217.680 € for the Czech partner). The execution of this project was completed as at 31 December 2011.
- project "Nature-friendly flood control measures in the confluence area of the Morava River and the Dyje River" (with a grant in the amount of 1,801.804 € for the Czech partner) was approved in 2010 and its execution is currently under way.

The newly approved project is "Schwarzenberg navigation canal – cultural heritage revives".

- 2. Operational Programme of Cross-border Cooperation between the Free State of Bavaria and the Czech Republic covers the implementation of the following projects:
- "The issues of nutrients and cyanobacteria in the Skalka water reservoir" with a grant in the amount of 135.371 €.
- "Cross-border water protection in the Drachensee Basin" with a grant in the amount of 92.650 €.
- "Mercury on the tributary to the Skalka water reservoir" with a grant in the amount of 68.000 €.

In 2011, all three projects were completed. The following projects continue to be executed in 2011:

- "The effects of the acidification on soils and water resources" with a grant in the amount of 407.150 €.
- "Bubbling Cheb area a river without borders" with a grant in the amount of 310.564 €.
- The newly approved project in 2011 became a project "Integrated soil and water protection in the Drachensee Basin" with a grant in the amount of 229.500 €.
- 3. Under the Operational Programme of Cross-border Cooperation between the Free State of Saxony and the Czech Republic, the following projects continued to be executed:
  - "The research of possibilities how to minimize the contents of organic harmful substances in drinking water resources in the Krušné hory Mountains" with a grant in the amount of 1,224.850 € and "The revitalization of peat-bogs between Hora Sv. Šebestiána and Satzung – Stage I" with a grant in the amount of 375,310.69 €.
  - Project VODAMIN focusing on flood prevention.
- Focusing on education is the project "The Elbe River our shared heritage" (with a grant in the amount of 467,117.50 €).

#### Newly approved projects include:

- "Flood protection and remediation of flood damage Hrádek nad Nisou – Zittau focusing on the rehabilitation of damaged meadows along the Nisa River in the area of Trojzemí and acquisition of water level monitoring system on the Nisa River and tributaries", with a total grant in the amount of 1.219 million €.
- Building adaptations including construction of a flood control dike will be executed under the project "Reconstruction of border communications and bridges after floods 2010" with a grant in the amount of 2.993 million €.

- The Krušné hory Mountains area, German-Czech project of waste water discharge with a grant in the amount of 6.630 million € focuses on construction of networks for German-Czech sewerage in the Upper Krušné hory Mountains area.
- T. G. Masaryk Water Management Research Institute, public research institution, on the Czech part represents a new project called "Jointly used groundwaters on the Czech-Saxonian border" with a grant in the amount of 9.991 million €.
- 4. Under the Operational Programme of Cross-border Cooperation between the Czech Republic and the Polish Republic, the following projects continued to be executed:
- The project "Optimization of water use and water quality improvement in the Metuje River basin in the Kladsko borderland through a construction of sewerage systems in the surroundings of the towns Chudoba and Náchod" (with a grant in the amount of 430,513.85 €) was executed between I May 2010 and 31 October 2011.
- Last but not least, also the project of the towns Žacléř and Lubawka: "The protection and rational management of surface waters and groundwaters in the Czech Polish borderland" with a grant in the amount of 4,494,181.23 €, whose execution has been under way since June 2009 and will be completed in May 2012.
- 5. Under the Operational Programme of Cross-border Cooperation between the Slovak Republic and the Czech Republic, the following projects continued to be executed:
- "Automatization of exchange of crisis data in the hydrological district of the Morava River and the Dyje River basins" with a grant in the amount of 1,288,212.52 € and a project following up with the already completed project titled "Flood control measures and early warning system Říka-Vlára-Váh Rivers, Stage II", with the ERDF support in the total amount of 338,493.61 €.



Runoff from hydraulic structure Přísečnice – specific profile

Under the Operational Programme for Supranational Cooperation there continues the execution of the projects LABEL - Adaptation to flood risk in the LABe-ELbe river basin, where the partners are the Ministry of the Environment, state-owned enterprises the VItava River Board, s. e. and the Elbe River Board, s. e., the Pardubický kraj, Liberecký kraj, Středočeský kraj, Královéhradecký kraj, Plzeňský kraj, Jihočeský kraj and Ústecký kraj regions and the claimed ERDF support amounts to 1,803.530 €. The project execution has been under way since I September 2008 and will be completed by 29 February 2012. The Czech partners to the project REURIS - REvitalization of Urban RIver Spaces are the Statutory City of Brno, Department of Planning and Development of the City of Plzeň and the ERDF support amounts to 619.977 €. The project implementation started on 1 September 2008 and was completed on 31 August 2011. In addition, under way is the execution of the project CEframe - Central European Flood Risk Assessment and Management in CENTROPE, where the Czech partners are the Ministry of the Environment, Regional Authority of the Jihomoravský kraj region and the ERDF support amounts to 599.250 €. The project execution is scheduled between I April 2010 and 31 March 2013.

Under the Operational Programme INTERREG IVC, the newly approved project is Lake-Admin (Regional administration of lake restoration initiatives), where the Czech partner is University of South Bohemia in České Budějovice, Faculty of Fisheries and Water Protection. The ERDF support for this project amounts to 157.250  $\epsilon$ . The project execution started on I January 2012 and is expected to be completed not later than 31 December 2014.

The Rural Development Programme of the Czech Republic for the period 2007–2013 is based on the National Strategic Plan for Rural Development and was prepared in accordance with the Council Regulation (EC) No. 1698/2005. The provision of grants is aimed at developing rural areas, improving the environment, supporting the expansion and diversification of economic activities, creating new jobs and strengthening solidarity of the rural population.

The subsidies from the Rural Development Programme are cofinanced from the EAFRD and from the state budget of the Czech Republic. The EAFRD support for the period 2007–2013 amounts to 2.8 billion  $\epsilon$  and the total support including the funds from the state budget of the Czech Republic amounts to 3.6 billion  $\epsilon$ . The funding for the Rural Development Programme proceeds in the form of pre-financing from the state budget, i.e. all payments to beneficiaries are first effected from national resources.

The Rural Development Programme through its measures significantly contributes not only to improving of living conditions in rural areas, but also supports investments in the basic water management infrastructure in municipalities with the population of less than 2 000 PE.

Measure III.2.1 Village Renewal and Development, Public Amenities and Services is divided into:

- sub-measure III.2.1.1 Village Renewal and Development,
- sub-measure III.2.1.2 Public Amenities and Services.

The sub-measure III.2.1.1 Village Renewal and Development is aimed at support for small municipalities with the population of less than 500. The support is intended for the area of traffic infrastructure including improvements in appearance of municipalities and for territorial plans of municipalities. In the area of water management infrastructure, the support is intended for municipalities with the population of less than 2000 PE (agglomerations with the population of less than 2000 PE). The sub-measures are further broken down to individual project schemes.

Under the project scheme b) public water supply systems, sewerage systems and waste water treatment plants, the applicants for subsidy may be municipalities and associations of municipalities.

Under this project scheme, support is not provided for projects aimed at construction of water supply systems, sewerage systems and waste water treatment plants in the territories requiring special protection — national parks and protected landscape areas including their protection zones, Natura 2000 sites, protected areas of natural accumulation of waters, water resource protection areas and the basin district of the Nové Mlýny hydraulic structure. The listed territories fall into the area of subsidies provided from the Operational Programme Environment. The association of municipalities may also include municipalities with the population of more than 2000 PE, but the project must be implemented in municipalities with the population of less than 2000 PE.

The eligible expenditures under scheme b) public water supply systems, sewerage systems and waste water treatment plants, for which subsidies can be drawn, include:

- public water supply systems,
- public sewerage systems and waste water treatment plants,
- supporting systems for the technical infrastructure,
- hard surfaces and laying of paved surfaces in connection with the project.

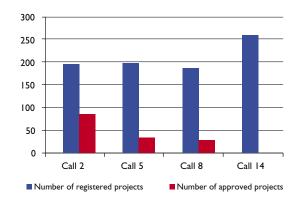


Flood control measures in the Lužická Nisa River in Machnín

For the sub-measure III.2.1.1 Village Renewal and Development, four Calls to submit the applications for the granting of support have already taken place. The last 14th Call took place in 2011 at the turn of October and November. Due to nearly exhausted funds, applications for the granting of support could be submitted only in some of NUTS 2 regions. Specifically, applications for the granting of support could be submitted in Central Bohemia, Southwest, Northeast and Moravia-Silesia regions (other NUTS II regions chose the project scheme a), i.e. traffic infrastructure).

#### Chart 9.4.I

Registered/approved projects in Call 2, Call 5, Call 8 and Call 14 to submit the applications for support – the state of approved applications/project execution under sub-measure III.2.1.1 Village Renewal and Development, project scheme b) public water supply systems, sewerage systems and waste water treatment plants as of 31 December 2011 in pcs



Source: MoA

Due to the fact that as of the mentioned date the results of Call I4 or the number of approved projects were not known, the chart only includes the number of registered projects under this Call. The chart further shows a sustained high applicants' interest in the measure and the fact that despite commitments higher than the average amount of allocation in first three Calls there remains a large number of projects not approved due to lack of resources for their financing.

In the period between 2007 and 31 December 2011, in total 130 applications for support in the amount of over CZK 2 billion were approved. Of this, 110 projects in the amount of CZK 1.6 billion were reimbursed, i.e. put into operation, before 31 December 2011.

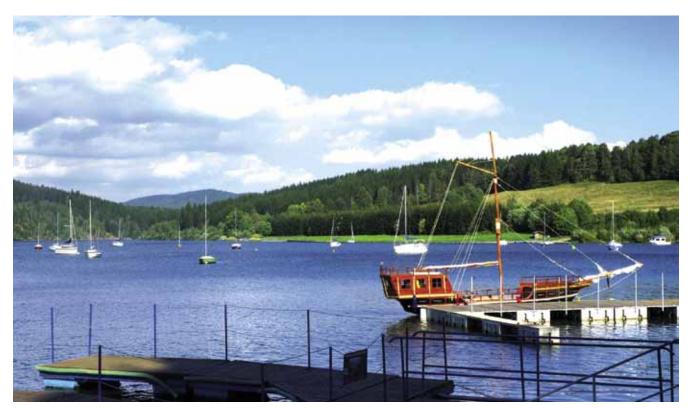
Table 9.4

Status of implementation of sub-measure III.2.1.1 Village Renewal and Development, project scheme b) public water supply systems, sewerage systems and waste water treatment plants as of 31 December 2011

	Ш.2.1.1 Ь
Number of registered projects	818
Amount claimed by registered projects	12,056,575.428 CZK
Number of approved applications	130
Amount covering approved projects	2,085,555.805 CZK
Number of reimbursed projects	110
Reimbursed amount	1,667,389.834 CZK

Source: MoA

Under the 2007–2013 programme period, the financial allocation for the measure III.2.1 Village Renewal and Development, Public Amenities and Services has already been fully exhausted. The last opportunity to submit the application for the granting of support was Call 14 which took place in autumn 2011.



Hydraulic structure Slezská Harta



**Lukáš Drdla – 8 years** Palachova primary school, Žďár nad Sázavou, kraj Vysočina region

## 10. Legislative measures

## 10.1 Water Act and implementing regulations

The Water Act in 2011 has not undergone any major changes, but there was completed the greater part of implementing legal regulations to reflect changes caused by major amendment of 2010 to the Water Act.

In the year 2011, water management legislation focused on completion of implementing legal regulations to the Water Act that responded mainly to changes in the Water Act made by major amendment No. 150/2010 Coll. Also practice was adapting to changes and new procedures set by major amendment.

## The wording of the Water Act was affected by the following two Acts:

First, the Act No. 77/2011 Coll. of 3 March 2011, amending the Act No. 25/2008 Coll., on the integrated pollution registry and on the integrated system of meeting environmental notification obligations and on amendment to some laws, as amended, and other related laws. This was necessitated by the amendment to the Act No. 25/2008 Coll., the related change in the Water Act only consisted in extending the method of meeting environmental notification obligations (Section 126, subsection 6) for the MoE data box designed to meet environmental notification obligations. The change became effective on the day of publication in the Collection of Laws, i.e. on 25 March 2011.

The latter Act affecting the wording of the Water Act was the Act. No. 151/2011 Coll. of 28 April 2011, amending the Act No. 258/2000 Coll., on the protection of public health and on amendment to some related laws, as amended, and the Act No. 254/2001 Coll., on waters and on amendment to some laws (the Water Act), as amended. This Act transferred the Directive of the European Parliament and of the Council 2006/7/EC of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC, mainly through the amendment to the Act on the protection of public health. The Water Act was not affected significantly by the changes, only a greater part of powers over bathing waters were transferred from the Water Act to the Act on the protection of public health and thus also the powers of the Ministry of Health and of the Regional Public Health Offices under the Water Act were repealled (repeal of Section 108, subsection 4 and Section 113). In connection with the transfer of Directive 2006/7/EC, the socalled bathing water profiles were established (Section 34), which are compiled, reviewed and updated by river basin administrators in cooperation with the Ministry of the Environment, the Ministry of Health, water authorities and the relevant regional public health offices. The content and the method of establishing bathing water profiles is specified by Decree No. 155/2011 Coll. The Act No. 151/2011 Coll. became effective, due to the ongoing advanced phase of infringement, on the day of publication in the Collection of Laws, i.e. on 7 June 2011.

As regards implementing regulations, nine Decrees and one Government Order were published in the Collection of Laws of the Czech Republic in 2011. Only one decree (No. 155/2011 Coll.) was not prepared following the major amendment to the Water Act.

The first of them was published in the Collection of Laws at the very beginning of the year, on II January 2011, Decree No. 5/2011 Coll., defining groundwater zones and groundwater

bodies, the method of groundwater status assessment and the requirements of groundwater status identification and assessment programmes. It responds to changes in the amendment to the Water Act No. 150/2010 Coll., regulating especially the definition of groundwater zones and groundwater bodies and their monitoring. The decree became effective on 26 January 2011.

On 17 February 2011, there was published in the Collection of Laws the Government Order No. 23/2011 Coll., amending the Government Order No. 61/2003 Coll., on indicators and limits of surface water and waste water pollution, requirements of permits to discharge waste waters into surface waters and sewerage systems and on vulnerable areas, as amended by the Government Order No. 229/2007 Coll. It responds to changes in the amendment to the Water Act No. 150/2010 Coll. (Section 15a, Section 38 and Section 39) and regulates especially the categorization of products reported for discharges into surface waters or the best available technologies in the field of waste water disposal and conditions of their use. Government Order No. 23/2011 Coll. became effective on 4 March 2011.

On 17 February 2011, there was published in the Collection of Laws the Decree No. 24/2011 Coll., on river basin management plans and flood risk management plans which, with regard to the new regulation of planning in the area of waters in the amendment to the Water Act No. 150/2010 Coll., repealled the Decree No. 142/2005 Coll. and regulates in detail the process of preparation of river basin management plans and flood risk management plans. The Decree No. 24/2011 became effective on 4 March 2011.

Decree No. 49/2011 Coll., defining surface water bodies, was published in the Collection of Laws on 8 March 2011. The decree defines surface water bodies for the purpose of identifying and assessing the status of these waters and preparing river basin management plans. It became effective on 15 March 2011.

The next of implementing regulations relating to the major amendment of the Water Act was published in the Collection of Laws on 12 April 2011. It is a Decree No. 93/2011 Coll., amending Decree No. 20/2002 Coll., on the method and frequency of measurement of quantity and quality of water. It responds to omitting the obligation to measure quality of abstracted surface waters and groundwaters through the amendment to the Water Act No. 150/2010 Coll. (this also led to a change in the name of the decree to "Decree on the method and frequency of measurement of quantity of water"). It became effective on 27 April 2011.

Decree No. 98/2011 Coll., on the method of status assessment of surface water bodies, the method of assessment of ecological potential of heavily modified and artificial surface water bodies and the requirements of programmes of surface water status identification and assessment, was published in the Collection of Laws on 15 April 2011. The decree responds to changes in the amendment to the Water Act No. 150/2010 Coll. and governs mainly the details of monitoring of surface waters. It became effective on 15 May 2011.

Following the change in the Water Act by the Act No. 151/2011 Coll. and the establishment of bathing water profiles, on I July 2011 there was published in the Collection of Laws Decree No. 155/2011 Coll., on bathing surface water profiles, defining the content and the method of establishing bathing water profiles. Decree No. 155/2011 Coll. became effective on I July 2011.

Decree No. 175/2011 Coll., amending Decree No. 450/2005 Coll., on essential elements of the use of harmful substances and essential elements of the emergency plan, the method and scope of accident reporting, their amelioration and elimination of their harmful effects was issued in the Collection of Laws on 29 June 2011. The decree responds to changes in the amendment to the Water Act No. 150/2010 Coll., especially specifying the rules for the use of harmful substances and essential elements of the emergency plan, the method and scope of accident reporting, the method of their amelioration and elimination of their harmful effects and defines the requirements concerning qualified persons and trap basins pursuant to Section 39 subsection 4 letter d) of the Water Act. It became effective on 15 July 2011.

Decree No. 216/2011 Coll., on details of the manipulation regulations and operating regulations of water works was issued in the Collection of Laws on 21 July 2011. This decree replaced the previous Decree No. 195/2002 Coll. and responds to changes in the amendment to the Water Act No. 150/2010 Coll., especially in the provision of Section 3 subsection 3, and specifies the requirements concerning operating regulations of the reported water work pursuant to Section 15a of the Water Act in the way, that it consideres instruction manual processed by contractor of the water work and complemented by some other details as operating regulations. Decree No. 216/2011 Coll. became effective on 1 st of August 2011.

The last in 2011, Decree No. 336/2011 Coll., amending Decree No. 432/2001 Coll., on documents for an application for a decision or standpoint and on details of a permit, consent and standpoint of a water act authority, as amended, was issued in the Collection of Laws on 21 November 2011. The decree responds to changes made by the amendment to the Water Act No. 150/2010 Coll., and the subject-matter of the decree was extended. Long expected decree became effective on 6 December 2011.

In 2011, the Interpretation Committee for the Water Act at its three meetings adopted five interpretations that are made available to the public on the website of the Ministry of Agriculture.

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

In 2011, neither direct nor indirect amendment to the Act No. 274/2001 Coll., on public water supply systems and sewerage systems was made. Amendment was made to Decree No. 428/2001 Coll., implementing the above mentioned Act. Changes under the decree only apply to Annexes, especially Annex No. 12 Target figures of annual water demand. Full text of the Annexes to Decree No. 428/2001 Coll., as amended by Decree No. 120/2011 Coll., becomes effective from 1 January 2012.

The Department of Water Management of the Ministry of Agriculture issued on 18 August 2011 under ref. No. 44929/2011-15000 the Guidance Document on the discharges and treatment of waste waters containing standard-exceeding pollution.

The purpose of this Guidance Document is to ensure a consistent approach in addressing the issues of the discharges and treatment of waste waters containing standard-exceeding pollution within the approval of Sewerage System Operating Regulations pursuant to Section 14 subsection 3 of the Act No. 274/2001 Coll., on public water supply and sewerage systems and on amendment to some laws, as amended, and Sections 24 and 25 of the MoA Decree No. 428/2001 Coll., on implementing regulations of the Act No. 274/2001 Coll., as amended.

In 2011, Senior Director of Water Management Department approved two interpretations that in relation to the Act on public water supply and sewerage systems were prepared by the Interpretation Committee at its one meeting.

# 10.3 Audits of the execution of state administration in the field of water management and water protection

#### Ministry of Agriculture

Auditing of the execution of the delegated authority in water management sector were carried out by the Ministry of Agriculture, through the Department for State Administration in the Water Management Sector and for River Basin Administration as the central water authority. At the regional level, auditing activities were carried out in compliance with the Government Resolution No. 1181 of 18 October 2006 and in compliance with the Plan for Audits of Regional Authorities and the City of Prague for the years 2010 and 2011 prepared by the Ministry of the Interior.

Audits carried out by the Ministry of Agriculture, in addition to examining water authority operation (such as the matters of the achieved qualifications and practice of personnel, organization of work, material background for work, etc.) focus on due application of the relevant legal regulations, in particular, the Act No. 254/2001 Coll. on Water and on amendment to certain laws (the Water Act), as amended, the Act No. 274/2001 Coll. on Public Water Supply and Sewerage Systems and on amendment to certain laws (the Water Supply and Sewerage Systems Act) as amended, as well as the related implementing legal regulations. The agenda of water right proceedings is also associated with other fields of administrative law, therefore, the audits were always also examining the compliance with the provisions of the Act No. 500/2004 Coll., Code of the Administrative Procedure, as amended. With regard to the fact that water authorities carry out the agenda of special building offices, the audits examined also the procedure according to the Act No. 183/2006 Coll., on Land-Use Planning and Building Code (the Building Act) as amended and its implementing legal regulations. In the particular proceedings, the audits are effected by examining the randomly selected documents.

The audits examining the execution of the delegated authority monitor the legality of this activity. This is corresponded to by the scope of the audits of the individual components guaranteeing legality in activities of water authorities – for instance, correct application of legal regulations in general, compliance with the relevant competence legal provisions, due conduct of administrative proceedings, compliance with administrative time-limits, provision of source documents for decisions in compliance with the Code of Administrative Procedure and the possibility to review the content of a decision.

Table 10.3.1

Audit of the execution of state administration, carried out by the Ministry of Agriculture at Regional Authorities in 2011

Region	Audit date
Liberecký	27 January 2011
Pardubický	24 February 2011
Moravskoslezský	29 March 2011
Vysočina	14 April 2011
Jihočeský	12 May 2011
Karlovarský	14 June 2011
City Council of Prague	30 June 2011
Zlínský	16 November 2011

Source: MoA

Based on the audits that were carried out it can be stated that the execution of the delegated authority by regional authorities in the water management sector maintains its high level. Positive as well are continuing efforts of regional authorities to provide detailed methodological guidance for water authorities in their jurisdiction. This statement can also be confirmed by the fact that no measures to remedy the situation were imposed in any of the audits. The most frequent shortcomings were identified, similarly to the previous periods, in the application of the relevant provisions of the Code of the Administrative Procedure in practice. The identified irregularities, nevertheless, in none of the cases made the issued decisions unlawful.

High levels of the execution of state administration are also reflected by the fact that the Ministry of Agriculture cooperates with Regional Authorities to develop water management legislation. In 2011, this cooperation consisted mainly in the preparation of changes in implementing regulations relating to the amended Water Act.

At the level of water authorities of municipalities with extended authority, the audits were carried out randomly in the period between July and September, in accordance with long-term efforts of the Ministry of Agriculture to contribute, mainly through the methodological guidance, to improvements in the level of execution of state administration in the water management sector.

The highly positive feedback from the audits confirms their correct targeting, which helps to deepen mutual communication at all levels of the administrative hierarchy. Beneficial to all interested parties as well is the acquaintance with the regional water right issues and findings in the field of application of legal regulations under the authority of the Ministry of Agriculture.

Table 10.3.2

Audit of the execution of state administration, carried out by the Ministry of Agriculture at water authorities of municipalities with extended authority in 2011

Municipality	Audit date
Municipal Office Jablonec nad Nisou	19 July 2011
Municipal Office Tanvald	19 July 2011
Minicipal Office Třebíč	27 July 2011
Municipal Office Moravské Budějovice	27 July 2011
Municipal OfficeZnojmo	28 July 2011
Municipal Office Dačice	28 July 2011
Municipal Office Praha 18	4 August 2011
Municipal Office Šternberk	10 August 2011
Municipal Office Uničov	10 August 2011
Municipal Office Zábřeh	II August 2011
Municipal Office Mohelnice	II August 2011
Municipal Office Praha 19	23 August 2011
Municipal Office Bystřice pod Pernštejnem	31 August 2011
Municipal Office Boskovice	31 August 2011
Municipal Office Kuřim	I September 2011
Municipal Office Tišnov	I September 2011

The audits of water authorities of municipalities with extended authority repeatedly confirmed the long-term trend of improving quality of the execution of the state administration in water management sector also at this level. In comparison with the regional authorities some larger differences in the quality of the management of the agenda continue to occur, but this is caused especially by the fact that the quality of work of the water authorities of municipalities with extended authority is influenced by personnel and material equipment. The higher quality level of the administrative proceedings is usually observed at larger water authorities, better equipped with personnel and material background, although this may not always be the case. In smaller municipalities, the delegated authority is sometimes executed by only one person responsible for several fields of administration, in some cases even including the separate authority.

In spite of that, nevertheless, most of the identified irregularities were largely of formal and procedural nature and repeatedly occurred to a larger or smaller extent practically in all of the authorities. Similarly to the regional authorities, the shortcomings were mainly identified in the application of the individual provisions of the new Code of the Administrative Procedure. Furthermore, conditions referred to in statements and opinions of the participants in the proceedings and the respective bodies were insufficiently incorporated into the conditions of the decision. It has to be emphasized, nevertheless, that despite these problems of purely formal and procedural nature the audits revealed no case of insufficient execution of the state administration.

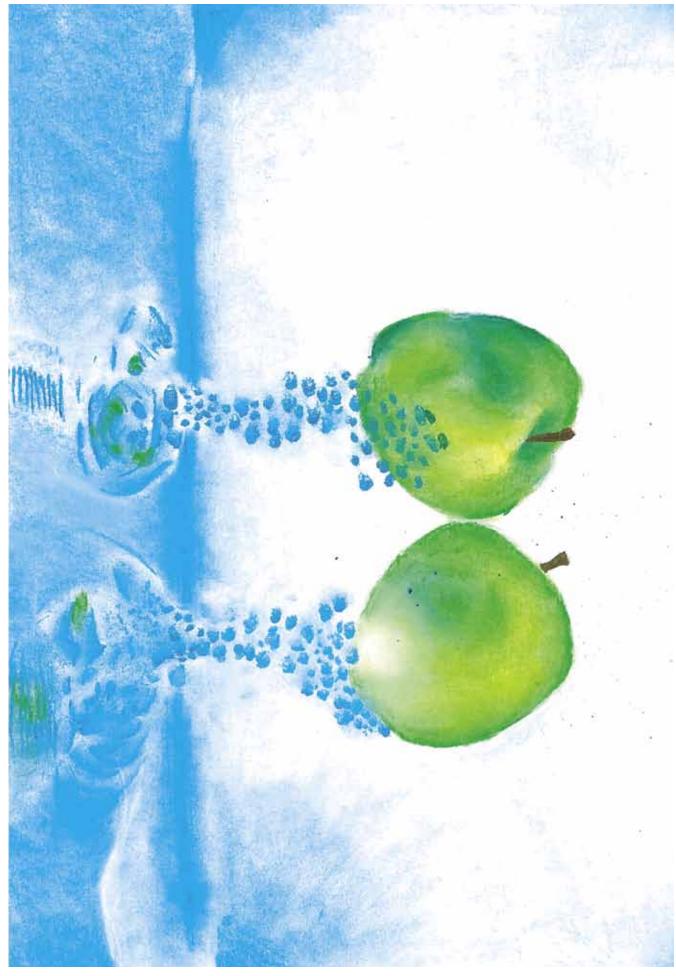
The audit results are used for the potential legislative or methodological activities. The water management sector also organized as every year a work meeting with water authorities, which is traditionally of high interest to all participants. These events are aimed at educating and making water authorities staff members acquainted with the current water management issues. The audit findings also serve as a basis to prepare concepts of the methodological presentations. In this way, the audit findings are almost immediately applied in the methodological guidance for subordinate water authorities.

The audit results show that despite the above mentioned minor shortcomings the execution of the state administration in 2011 in the water management sector at all levels of water authorities can be assessed to be of high quality and again fully meeting the requirement for adherence to the basic principles of public administration which can be called public service.

#### Ministry of the Environment

The departments executing state administration at the Ministry of the Environment, in compliance with the rules of organization, similarly to the past years, dealt only with individual appeals against first instance decisions of the Czech Environmental Inspectorate, the City Council of Prague and the regional authorities.

In 2011, similarly to the years before, the Department of Water Protection organized work meetings with water authorities and the Czech Environmental Inspectorate. The purpose of this event was to make water authorities staff members acquainted with the current issues of water protection and the activities of the Department of Water Protection. Staff members of the Department of Water Protection of the Ministry of the Environment participated, whenever possible, also in other training workshops and meetings organized by the individual regional authorities.



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# II. Priority tasks, programmes and key documents in water management

## II.I Planning in the field of waters

In 2011, the implementation of Programmes of Measures adopted by River Basin Management Plans continued. There also started a preparation of the second river basin management planning cycle until 2015, during which the current River Basin Management Plans will be reviewed and updated. In the preparation of flood risk management plans, areas with significant flood risks were defined.

Programmes of Measures to achieve the objectives of water protection are to be implemented within three years from the approval and publication of the respective plans, i.e. by 22 December 2012. In 2011, there began a preparation of report to the European Commission pursuant to Article 15 par. 3 of Directive 2000/60/EC describing the progress achieved in preparing and implementing the approved measures to protect waters; the report will also be the basis for updating the measures within the second river basin management planning cycle.

For the purpose of the second river basin management planning cycle, activities of the Commission for Planning in the Water Sector at the national level as well as of the commissions for subbasins for each of the river basin administrators were renewed in 2011 in cooperation between the Ministry of Agriculture and the Ministry of the Environment.

The task of these commissions is, similarly to the first river basin management planning cycle, the coordination of the preparation of national river basin management plans, sub-basin management plans and flood risk management plans. Its members are representatives of the central authorities, under the competence of which there fall various areas relevant to water planning, representatives of the regional authorities, the Association of Regions of the Czech Republic, river basin administrators, Forests of the Czech Republic, significant water management institutions, Agency for Nature Conservation and the Landscape Protection, Czech Environmental Inspection, major water users and non-governmental organizations. Working Group for implementation of the Flood Directive was incorporated into the Commission for Planning in the Water Sector.

To ensure planning in the water sector by 2015, a time schedule and work programme which identifies the individual tasks in the process of planning in the water sector and assigns responsibility for addressing these challenges started to be prepared. The general objective of planning in the water sector there remains, also for the second planning cycle, a definition and mutual harmonization of public interests to protect water as the environmental compartment, a reduction of the adverse effects of floods and droughts and sustainable use of water resources, especially for the purposes of drinking water supply. In the second river basin management planning cycle, the authors of plans have to eliminate uncertainties specified in the approved river basin management plans through ensuring the availability of existing and adding the missing data, and they also have to address a number of new suggestions and requirements. The most important requirements include those ensuing from the Strategic Framework for Sustainable Development of the Czech Republic and the requirement of the European Commission to take into account the need for adaptation to climate change in updating Programmes of Measures for the second planning cycle. Other requirements include mutual harmonization of measures to achieve good water status and measures for flood risk management, harmonization of river basin management plans with development plans for water supply and sewerage systems in terms of protection of water resources and investments in the development of the sector of drinking water supply, sewerage and waste water treatment. The second planning cycle in the water sector will also have to be more interlinked with the Common Agricultural Policy which is scheduled to be reformed by 2013. This reform will be an exceptional opportunity for the Czech Republic, how to further modernize the Common Agricultural Policy and adapt its operations to better respond to the current needs and challenges faced by European society. In this context, a preparation of the new setting of Rural Development Programme for the years 2014-2020 is under way. This programme should focus on stronger enforcement of water management measures. The condition for successful linking of river basin management plans with the Common Agricultural Policy is that measures under river basin management plans must be compatible with the tools of Rural Development Programme.

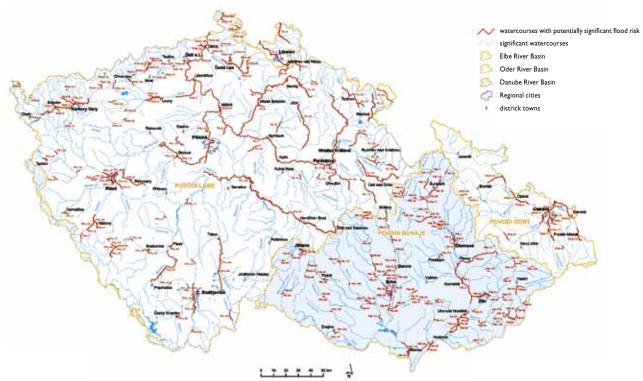
The significant part of water management planning is the implementation of the Directive 2007/60/EC of the European Parliament and of the Council, on the assessment and management of flood risks. In 2011, in accordance with the requirements of the Directive, with financial support provided by the Ministry of the Environment, a preliminary assessment of flood risks and definition of areas with potentially significant flood risks was completed (see Figure 11.1.1). After taking into account the comments, the resulting material is made available to the public and can be found on the website of Flood Information System www.povis.cz. This system will further be used to inform and involve the public in further work in the implementation of the Flood Directive.

The transparency of the process is contributed to by the fact that all current and general information on water management planning process are available to the public on the website of the Ministry of Agriculture www.eagri.cz with links to the websites of the Ministry of the Environment and individual river basin administrators. More information relating to water management planning is provided on the website of Public Administration Information System WATER www.voda.gov.cz.



The Krounka River in Předhradí

Figure 11.1.1
Definition of areas with potentially significant flood risks in the Czech Republic



Source: MoE

## II.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 I, Letter c) of the 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.

The National Development Plan for Water Supply and Sewerage Systems is a medium-term concept of the sector of water supply and sewerage systems for the period until the year 2015. It follows up with other strategic documents and departmental policy documents and also respects the requirements resulting from the relevant regulations of the European Communities.

The Regional Development Plans for Water Supply and Sewerage Systems are the basis for utilization of the European Community funds and national financial resources for construction and renewal of water supply and sewerage system infrastructure. Therefore, one of the obligations of each applicant requesting the provision of the state financial support is to document the compliance of the submitted technical and economic solution with the valid Regional Development Plan for Water Supply and Sewerage Systems.

For the approved and effective Development Plans for Water Supply and Sewerage Systems in the Regions of the Czech Republic, the Ministry of Agriculture continued to issue statements on the proposed changes in the technical solutions for drinking water supply and waste water sewerage and treatment.

302 statements were issued in 2006, 423 statements were issued in 2007, 597 statements were issued in 2008, 612 statements were issued in 2009, 1,163 statements were issued in 2010

and 352 statements were issued in 2011 by the Ministry of Agriculture. In total for the period 2006–2011, the Ministry of Agriculture issued 3,449 statements.

The Regional Development Plans for Water Supply and Sewerage Systems are used by the Ministry of Agriculture, the Ministry of the Environment, the regional authorities, municipalities with extended authority (water authorities), municipalities, owners and operators of water supply and sewerage systems as well as by both specialists community and the general public.

The National Development Plan for Water Supply and Sewerage Systems together with the Regional Development Plans for Water Supply and Sewerage Systems express the concept of the Ministry of Agriculture. In relation to this fact a change is being prepared, through which these materials will become continually complemented medium-term plans. This means that a preparation of new plans will not be carried out after the elapsed expiry dates.

## II.3 Programmes and measures to reduce surface water pollution

The programme to reduce surface water pollution by hazardous substances and especially hazardous substances

The Programme to Reduce Surface Water Pollution by Hazardous Harmful Substances and Especially Hazardous Harmful Substances (hereinafter the "Programme") was adopted by the Czech Republic Government Resolution No. 226 of 22 March 2010. This resolution established an obligation to prepare every two years, starting in 2011, the information on the progress of implementation of the Programme and submit it to the Government as part of the Report on Water Protection. With regard to the Government Resolution No. 770 of 2007, however, the report concerned is the

Report on Water Management in the Czech Republic in 2011. The commitment to prepare the Programme is based on Article 6 of Directive of the European Parliament and of the Council 2000/60/EC of 23 October 2000, establishing a framework for Community action in the field of water policy. It was transferred into Section 38 subsection 5 of the Act No. 254/2001 Coll., on waters and on amendment to some laws (the Water Act), as amended.

The Programme is valid for the entire territory of the Czech Republic for the period between I January 2010 and 22 December 2013, and relates to the substances or groups of substances hazardous to (or through) the aquatic environment, listed in Annex I of the Water Act. The Programme specifies the main measures related to water protection and other measures not directly related to water protection, but which ultimately contribute to water protection.

#### Especially hazardous harmful substances

The discharges of waste waters containing especially hazardous harmful substances, listed in Annex I to the Water Act and specified in part C of Annex I to the Government Order No. 61/2003 Coll., on indicators and values of permissible pollution of surface waters and waste waters, on requirements for permits to discharge waste waters to surface waters and to sewerage systems and on vulnerable areas, as amended by the Government Order No. 229/2007 Coll., to surface waters and sewerage systems may only be performed if permitted by the water authority (Section 38, Subsection 3 of the Act No. 254/2001 Coll.). Permissible values of pollution indicators for waste waters with the contents of especially hazardous harmful substances, for sectors of industry and types of production listed in Annex I, part C of the Government Order No. 61/2003 Coll., had to be complied with as at the date of the accession of the Czech Republic to the EU, for certain sectors of industry or uses as at the date of 31 December 2009. The following text describes the status for the year 2010 for each of especially hazardous harmful substances, the discharges of which from the pollution sources are relevant.

In the Czech Republic there exist approximately 60 important economic entities or their plants that by the activity according to the sectoral classification CZ-NACE fall within the scope of part C of Annex No. I to the Government Order No. 61/2003 Coll.

The most significant sources of mercury pollution include plants engaged in the chemical production (amalgam electrolyzers in two plants), refining of metals and hazardous waste disposal. In the majority of cases, the most advanced technological processes are applied in the facilities and slight exceedances of emission standards occur only sporadically. Small mercury pollution sources include, in particular, stomatological facilities, reaching the number of approximately 6,000 registered in the Czech Republic. As at 31 December 2005, all these stomatological workplaces were furnished with amalgam separators showing the efficiency of at least 95 %. There is an ongoing process of replacing the electric facilities containing mercury by facilities not containing this hazardous substance.

The discharges of cadmium, according to part C of Annex No. I to the Government Order No. 61/2003 Coll. concern particularly plants engaged in metallurgy of cadmium and nonferrous metals, production of negative accumulator mass or Ni-Cd galvanic cells, production of fertilizers and in surface finishing, in total 10 significant plants. In the majority of cases, the most advanced technological processes are applied in the facilities. In two of them, technologies wihout the production of waste waters are used. As regards cadmium plating, used by 50 % of the plants in question, emission standards expressed in grams of the discharged cadmium relative to the quantity of

processed cadmium are not complied with. This is particularly given by a very small quantity of cadmium consumed in the process of electroplating (generally first kilogrammes per year). The discharges of waste waters containing cadmium are fully in compliance with water management permits. Cadmium pollution of waste waters further occurs in the locations where this hazardous substance appears as an admixture in raw materials used or in the contaminated sites (for example, the Příbram area). Significant quantities of cadmium compounds are also used in glass industry (for glass-staining), however, the discharges of waste waters to surface waters occur to the minimum extent only. Every year, the consumption of cadmium and its compounds for surface finishing of metals gradually declines, and cadmium using plants in glass industry are gradually restricted or closed.

The only significant source of tetrachloromethane, hexachlorobenzene and hexachlorobutadiene pollution of waters is the production of tetrachloroethene and tetrachloromethane by perchlorination. Exceedances of the emission standards set by the Government Order No. 61/2003 Coll. do not occur. The Integrated Pollution Register mentions emissions of hexachlorobenzene in wastes only. As regards tetrachloromethane, emissions to the air are registered, as regards hexachlorobutadiene, emissions in wastes are registered.

Chloroform in significant quantities is used as organic solvent in the pharmaceutical production (only two producers in the Czech Republic). Exceedances of the emission standards set by the Government Order No. 61/2003 Coll. do not occur. Trichloromethane is further used as solvent in organic synthesis for the production of adamantane in the pilot plant apparatus. The Integrated Pollution Register mentions emissions of this substance in both waters and wastes. In total four plants are registered to monitor chloroform in their waste waters.

The production of 1,2-dichloroethane proceeds in the only plant in the Czech Republic. In 2010, emission standards set by the Government Order No. 61/2003 Coll. were complied with. With regard to the earlier unsatisfactory situation, the pollution monitoring frequency has been changed since 2005 and daily measurements are performed. From the production plant premises, this hazardous substance is also discharged via the remediation waters. Further, 1,2-dichloroethane is used for the production of other substance than vinylchloride. In the technological process, no waste waters are produced. To the limited extent, 1,2-dichloroethane is used as solvent in the pharmaceutical production. In total four plants are registered to monitor 1,2-dichloroethane in their waste waters.

The production of tetrachloroethene is carried out in the only plant in the Czech Republic, using the TETRA-PER technique – the manufacturing unit designed for the production by the method of thermic chlorination of propylene in excess chlorine. The latest technological procedures are used in this facility. In 2010, emission standards set by the Government Order No. 61/2003 Coll. were complied with. Further, tetrachloroethene along with trichloroethene are used in significant quantities especially as solvent and degreasing agent before surface finishing of metals by 56 plants. Permits to discharge waste waters with the contents of trichloroethene or tetrachloroethene were granted to approx. 30 % of plants, especially where waste waters are produced from the regeneration of sorbent fillings capturing these hazardous substances from the exhausted air in the working environment. Most of the plants handling the trichloroethene or tetrachloroethene solve or have already resolved the problems of sites contaminated by these substances. The emission standards set by the Government Order No. 61/2003 Coll. for the discharges of waste waters containing the hazardous substance are being complied with. The pollution is monitored using the AOX indicator. The formation of trichloroethene in the production of tetrachloroethene and tetrachloromethane using

the perchlorination cannot be excluded, the emission standards for the contents of tetrachloroethene in waste waters from this production are complied with. In 2010, the use of trichloroethene or tetrachloroethene to degrease metals was finished in a number of plants. From year to year, the consumption declines and these substances remain to be used in the cases where technological substitution for other environmentally acceptable degreasing agents is not possible. The Integrated Pollution Register states only leakages of these substances to the air and their contents in wastes (a declining trend). In total 63 plants are registered to monitor tetrachloroethene in their waste waters.

#### Hazardous substances

With regard to the extent of hazardous substances, they are not individually discussed. The discharges of waste waters containing hazardous substances are also subject to permits granted by the water authority. The electronic registration of the selected data from the effective administrative decisions falls within the cognizance of Decree No. 7/2003 Coll., on Water Right Evidence, as amended by Decree No. 619/2004 Coll., Decree No. 7/2007 Coll. and Decree No. 40/2008 Coll. The obligation of water authorities to include in this electronic registration also all earlier issued decisions was extended until 31 December 2009. The central database of water right evidence is maintained by the Ministry of Agriculture.

#### Audits performed for management of hazardous substances

In 2010, approximately 460 audits were carried out in industrial plants and establishments providing services (such as petrol stations), and 270 audits were carried out in facilities with the integrated permit. Pursuant to the Water Act, 42 penalties in the amount of CZK 3,450.450 were imposed on industrial plants and establishments providing services. In total 76 farming establishments were audited and 19 penalties in the amount of CZK 705,527 were imposed. In the area of fisheries, 37 establishments were audited and 6 penalties in the amount of CZK 95,000 imposed. Minor irregularities were resolved by imposing corrective measures in approximately 35 cases.

In 2010, in total 8 kg of Hg, 4 kg of Cd and 38,700 kg of AOX contained in discharged waste waters were charged for. The Czech Environmental Inspection in cooperation with the regional authorities and integrated inspection bodies, pursuant to the Act No. 59/2006 Coll., on the major accident prevention, audited in 2010 in total 157 entities (43 falling within group A, 113 within group B and I establishment not classified). Since 2000, when the Act on the major accident prevention became effective, six major accidents by course of this law occurred. In 2010, no such accident occurred. With regard to the quantities of leaked substances, the number of persons injured and the fact that no environmental damage occurred, other emergency events were not accidents by course of the Act No. 59/2006 Coll.

## Construction projects for water quality protection completed in 2011

As regards the most important projects relating to the sources of pollution produced by the municipalities with the population of more than 2,000 PE, the following waste water treatment plants were completed in 2011 (N = nitrification, DN = denitrification, BP = biological removal of phosphorus, CHP = chemical removal of phosphorus):

New municipal waste water treatment plants (in total 18,300 PE): Třeboň (16,000 PE, N, DN, CHP), Konice (2,300 PE, N, DN, CHP).

New industrial waste water treatment plant: Vinium Velké Pavlovice (8,700 PE, N, DN, CHP).

## Furthermore, the existing municipal waste water treatment plants were reconstructed or extended in 2011:

The existing municipal waste water treatment plants: Uherský Brod (95,170 PE, N, DN, CHP), Strakonice (75,000 PE, N, DN, CHP), Krnov (70,000 PE, N, DN, CHP), Česká Lípa (48,150 PE, N, DN, CHP), Pelhřimov (43,000 PE, N, DN, CHP), Nový Jičín (35,000 PE, N, DN, CHP), Kopřivnice (29,000 PE, N, DN, CHP), Broumov (25,167 PE, N, DN, CHP), Nové Město nad Metují (25,000 PE, N, DN, CHP), Rokycany (25,000 PE, N, DN, CHP), Moravská Třebová (20,070 PE, N, DN, CHP), Říčany (16,160 PE, N, DN, CHP), Hlučín (13,300 PE, N, DN, CHP), Police nad Metují (11,950 PE, N, DN, CHP), Tachov (11,600 PE, N, DN, CHP), Nový Bydžov (10,000 PE, N, DN, CHP), Studénka (9,500 PE, N, DN, CHP), Praha-Vinoř (8,923 PE, N, DN, CHP), Staré Splavy (8,440 PE, N, DN, CHP), Žirovnice (8,340 PE, N, DN, CHP), Opočno (8,000 PE, N, DN, CHP), Praha-Kbely (7,120 PE, N, DN, CHP), Pečky (7,000 PE, N, DN, CHP), Pacov (7,000 PE, N, DN, CHP), Stráž pod Ralskem (7,000 PE, N, DN, CHP), Klánovice (6,055 PE, N, DN, CHP), Úvaly (6,000 PE, N, DN, CHP), Chýně (6,000 PE, N, DN, CHP), Dolní Břežany (5,000 PE, CHP), Trnávka (4,800 PE, N, DN, CHP), Hrušovany nad Jevišovkou (4,500 PE, N, DN, CHP), Jince (4,400 PE, N, DN, CHP), Lány (4,000 PE, N, DN, CHP), Řevnice (3,700 PE), Nebušice (3,600 PE, N, DN, CHP), Heřmanice (3,600 PE, N, DN), Němčice nad Hanou (3,500 PE, N, DN, CHP), Mirošov (3,300 PE, N, DN, CHP), Blovice (3,300 PE, N, DN, CHP), Jirny (3,200 PE, N, DN, CHP), Dolní Čermná (3,200 PE, N, DN, CHP), Dubenec (3,000 PE, N, DN), Mratín (2,500 PE, N, DN, CHP), Nučice (2,500 PE, N, DN, CHP), Slavonice (2,500 PE, N, DN, CHP), Dolní Roveň (2,300 PE, N, DN), Velké Hamry (2,300 PE, N, DN, CHP), Hrotovice (2,200 PE, N, DN, CHP), Kunštát (2,100 PE, N, DN, CHP), Hluboká – Zámostí (2,080 PE, N, DN), Nová Ves pod Pleší (2,000 PE, N, DN), Slapy (2,000 PE).

#### Action Programme under the Directive of the Council 91/676/ EEC (so-called Nitrate Directive)

In 1991, Council Directive 91/676/EEC on the protection of waters against pollution caused by nitrates from agricultural sources, the so-called Nitrate Directive, was adopted. The transfer of the Nitrate Directive was implemented into the provisions of Section 33 of the Act No. 254/2001 Coll., on waters, as amended (the Water Act), where it is imposed on the government to set by order vulnerable areas and in these areas to regulate the use and storage of fertilizers and farmyard manure, crop rotation and implementation of erosion control measures (the so-called Action Programme).

Vulnerable areas represent the areas, where the contamination of groundwaters and surface waters by nitrates has already exceeded or might exceed the set limit of nitrate concentration in amount of 50 mg/l. The list of vulnerable areas was promulgated by the Government Order No. 103/2003 Coll., on the designation of vulnerable areas and on the use and storage of fertilizers and farmyard manure, crop rotation and implementation of erosion control measures in these areas. Vulnerable areas are subject to review, according to the Nitrate Directive, at least every four years from their promulgation. The first review of vulnerable areas was carried out in 2007 and promulgated through the amendment to the Government Order No. 219/2007 Coll., with effect from I September 2007. The second review of the designation of vulnerable areas was carried out in March 2011 and will be promulgated through the Government Order, whose preparation is under way, with effect from 1 July 2012.

The Action Programme which is prepared each time for the period of four years, represents mandatory methods of management in the defined vulnerable areas which are aimed at reducing the risk of nitrogen leaching into surface waters and groundwaters. Through the amendment to the Government Order No. 103/2003 Coll., the so-called Action Programme 2 (Government Order No. 108/2008 Coll.) with effect from 4 April 2008 was promulgated and through the Government Order, whose preparation is under way, Action Programme 3 will be promulgated, with effect from 1 July 2012. User relation-based Land Use Register brings information for farmers on measures which the farmer should comply with within the specific land block. The Action Programme is the most effective system of measures in the implementation of the Nitrate Directive.

The general measures of the Action Programme in the Czech Republic which is produced in compliance with Annex III to the Nitrate Directive, include:

- Period, when the use of certain types of fertilizers and farmyard manure is prohibited.
- 2. The establishment of maximum nitrogen fertilization limits for the individual crops.
- 3. Specification of the minimum capacity of farmyard manure storage facilities allowing to store farmyard manure during the period when manuring is prohibited (in the Czech Republic, this is based on general legal regulations; from the year 2014 on, the required capacity of farmyard manure storage facilities will have to be large enough for six-month production).
- 4. Ban on wide-row crop growing on land threatened by erosion.
- 5. Reduction of the application of fertilizers on sloping land.
- 6. Maintaining a protection zone near surface water bodies.

The measures included in the Action Programme must guarantee that the quantity of farmyard manure together with organic and organic-mineral fertilizers applied in any farming establishment in a vulnerable area will not exceed on average the limit of 170kg nitrogen per hectare per year.

The Government Order, whose preparation is under way, will slightly extend vulnerable areas and, mainly based on comments raised by the European Commission, it will tighten some methods of land use and management in these areas. This is particularly the extension of the period when the use of fertilizers is prohibited, the harmonization of farming on sloping land with GAEC requirements and by the end of 2013 the increase in the capacity of farmyard storage facilities for six-month production.

## II.4 Czech Republic's reporting to the EU

The reporting pursuant to the Council Directive 91/271/ EEC, concerning urban waste water treatment

Official data on the status of waste water treatment in 2011 was submitted to the European Commission as part of regular reporting under Article 15 of Directive 91/271/EEC, concerning urban waste water treatment, in three terms as required by the European Commission between February and March 2012. The corrected reporting was carried out as required by the European Commission on 30 March 2012. The data will be publicly available on the EIONET.

The reporting documents the status of waste water discharges as of 31 December 2011 in the Czech Republic in agglomerations with the population of more than 2,000 PE. All agglomerations with the population of more than 10,000 PE have nitrogen and phosphorus removal (tertiary treatment), although not all meet the requirements of the Directive in terms of quality limits of discharged waste waters. This fact was also reflected in filling the data in the reported WWTP database. Still, there are agglomerations in the category of between 2,000 and 10,000 PE, which do not have yet their own waste water treatment plant.

The situation in agglomerations with the population of more than 2,000 PE at the end of 2011 is as follows: requirements of the Directive in terms of treatment limits are not met by 35 agglomerations (20 agglomerations having a waste water treatment plant fail to meet the requirements for total nitrogen and 15 agglomerations still do not have a waste water treatment plant). In total 6 agglomerations are connected to a waste water treatment plant in other agglomerations having still unsatisfactory WWTP and 2 agglomerations build connections to a satisfactory waste water treatment plant in another agglomeration. Unsatisfactory status of waste water discharges and treatment in relation to the Directive is shown by 43 agglomerations of the total number of 633 agglomerations with the population of more than 2,000 PE. The current status is continuously improving.

Reporting pursuant to the Council Directive 76/160/EEC, concerning the quality of bathing water and Directive of the European Parliament and of the Council 2006/7/EC, concerning the management of bathing water quality

In terms of the European legislation, the issues of bathing waters are governed by the following Directives: Council Directive 76/160/EEC of 8 December 1975, concerning the quality of bathing water, which will be repealled with effect from 31 December 2014, and Directive of the European Parliament and of the Council 2006/7/EC of 15 February 2006, concerning the management of bathing water quality and the repeal of Directive 76/160/EEC. Before the start of the bathing season 2011, a list of waters identified as bathing waters for the recreational season 2011 was submitted to the European Commission. Report on the quality of waters used for bathing in the recreational season 2011 was prepared in accordance with the requirements of Directive 76/160/EEC and submitted to the European Commission in December 2011. Reports from European countries are annually after the processing of the results placed on the portal of the European Commission http://ec.europa.eu/environment/water/ water-bathing/index\_en.html.

In the Czech Republic, waters used for open air bathing of persons are divided into natural open air bathing pools operated on surface waters used for bathing (surface waters where bathing services are offered by the pool operator) and surface waters where large numbers of persons are expected to bathe and for which no permanent ban on bathing or permanent warning against bathing was issued by the relevant public health protection authority (so-called other surface waters used for bathing).

The most frequent problems of water quality in the Czech Republic are associated with the mass presence of cyanobacteria, which during the bathing season 2011 led to the ban on bathing at 12 sites. At one site, the ban on bathing was imposed due to exceedances of the microbiological indicators. Of the total number of 183 reported bathing waters, only one site was classified as failing to comply with the mandatory values defined by Directive 76/160/EEC.



Hydraulic structure České Vrbné



**Kateřina Rjašková – 8 years** Komenského primary school, Ústí nad Orlicí, Pardubický kraj region

# 12. International cooperation in the field of water protection

Water as a force of nature knows no boundaries. Problems that occur in the field of water management on the territory of one country may become a problem faced by other states situated in the lower parts of the river basin. Similarly, the measures implemented within one region may affect the neighbouring regions. This fact is significantly noticeable in international relations. The aim of the Czech Republic is to maintain these relations at such level, so that Czech water management problems were manifested in other states as little as possible and that measures implemented by the Czech party on its territory would be of not negative, but rather a positive impact on the neighbouring states. Although the Czech Republic is not a coastal state, it participates through this cooperation in reducing pollution of the North Sea, the Black Sea and the Baltic Sea.

The principle of international cooperation of the Czech Republic in the field of water protection, based on international agreements, treaties and conventions, is the comprehensive protection of surface waters and groundwaters in integrated hydrological river basins or groundwater zones. This cooperation is based on:

- I. cooperation within UN ECE;
- cooperation in the area of international river basins of the Danube, the Elbe and the Oder;
- cooperation of the Czech Republic with the neighbouring states in the field of water management on transboundary watercourses.

## 12.1 Cooperation within UN ECE

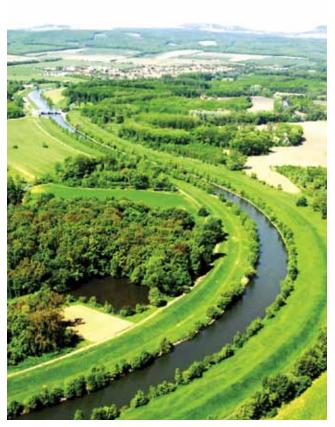
The cooperation within the framework of UN ECE covers most of the aspects of protection of the quality and quantity of waters. The Convention on Protection and Use of Transboundary Watercourses and International Lakes in its Article 9 assumes that the riparian states sharing the same waters shall enter into bilateral or multilateral agreements or other arrangements, which is met by the cooperation of the Czech Republic within transboundary waters and integrated river basins. Thanks to the Protocol on Water and Health having become effective, this cooperation also includes the aspect of the population health protection against diseases transmitted by water.

## Convention on Protection and Use of Transboundary Watercourses and International Lakes

The Czech Republic has been a party to the UN ECE Convention on Protection and Use of Transboundary Watercourses and International Lakes ("Convention on Water") since May 2000 and the Czech experts participate in activities relating to the fields of integrated management of water resources and water ecosystems, monitoring and assessment of water status, flood control, adaptation to climate change, protection of waters against accidental pollution from industrial sources, support for international cooperation on transboundary watercourses and in integrated international river basins as well as to the field of water and human health.

In 2011, the activities within the UN ECE Convention on Water focused on completion of the preparation for the 7th ministerial conference The Environment for Europe, which took place on 21

-23 September 2011 in Astana in Kazakhstan. With regard to the fact that one of the main topics of the conference was water and its environment, the Secretariat and the Bureau of the UN ECE Convention on Water participated in organizing the conference. Bureau of the UN ECE Convention on Water together with the UN ECE Committee for Environmental Policy prepared the conference topics: "sustainable management of waters and the related ecosystems", "sustainable management of waters and greening of the economy" and "greening of the economy - the inclusion of environmental considerations into economic development" and agreed upon the way of their presentation at the conference. The Working Group for integrated management of water resources in cooperation with the Bureau prepared a questionnaire "Water Action", which represents a list of actions taken up by the individual countries at the conference. For the needs of the conference, the Working Group for monitoring and assessment prepared a publication "The Second Assessment of Status of Transboundary Watercourses, International Lakes and Groundwaters", which comprehensively assesses the watercourses, lakes and groundwaters within the entire UN ECE region. In parallel to these activities, discussions of the joint group for water and accidents on preparing the harmonization of emergency planning for accidents with a possible impact on transboundary waters and a workshop on the 25th anniversary of the accident in Sandoz called "Sandoz+25" took place. The group for legal issues dealt with preparation of a document concerning the mechanism to support the implementation of the Convention on Waters and control of this implementation. This group was also preparing a document on groundwaters. In connection with the work of the task force for water and climate, a regular workshop on this topic was organized.



The Dyje River in Bulhary

#### Protocol on Water and Health

Within the UN ECE Convention, a convention document was produced with focus on the connection between water and human health – the Protocol on Water and Health. The Czech Republic has been a party to the Protocol since 2001. The Protocol entered into force in 2005.

In 2011, guidance documents related to the setting of the Protocol objectives and control mechanisms were reviewed. Exchange of experience in monitoring the occurrence of diseases transmitted by water continued, parties to the Convention dealt with problems of quality of bathing waters and waters from small sources, which are also associated with the communication with the public.

In more detail, the information on the UN ECE Convention and the Protocol is available on the website www.unece.org/env/water.

# 12.2 International cooperation in the field of water protection in the integrated Elbe River, Danube River and Oder River Basins

International cooperation in the field of water protection in the integrated river basins proceeds through the International Commission for Protection of the Elbe, the International Commission for Protection of the Danube River and the International Commission for Protection of the Oder River against Pollution.

The Commissions were established for the purpose of implementation of the following international agreements:

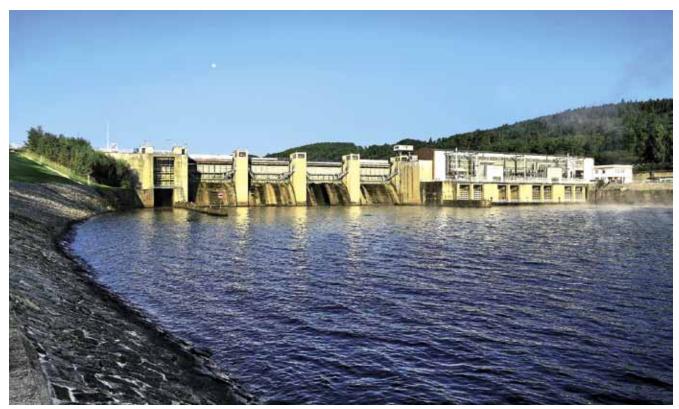
- Agreement on the International Commission for Protection of the Elbe (signed on 8 October 1990, entry into force on 13 August 1993);
- Convention on Cooperation for Protection and Sustainable Use of the Danube River (signed on 29 June 1994, entry into force on 22 October 1998);

 Agreement on the International Commission for Protection of the Oder River against Pollution (signed on 11 April 1996, entry into force 28 April 1999).

This international cooperation in protection of the main river basins in the Czech Republic primarily focuses on reducing the pollutant load on the Elbe, the Danube River and the Oder River, striving to achieve an ecosystem that is as close as possible to natural condition with a healthy diversity of species, allowing the use of water, especially the provision of drinking water from bank infiltration and the agricultural use of water and sediments, reducing pollution in the North Sea from the Elbe River Basin, in the Black Sea from the Danube River Basin and in the Baltic Sea from the Oder River Basin, flood control, coordinated implementation of Directive 2000/60/EC of the European Parliament and of the Council, establishing a framework for Community action in the field of water policy in integrated river basins.

## Agreement on the International Commission for Protection of the Elbe

The International Commission for Protection of the Elbe is the most important board of the Czech-German cooperation in the field of water protection in the Elbe River Basin. Its activity is focused on reducing the pollution of the Elbe and its tributaries, improving the status of water-related ecosystems, the programmes of water quality measuring and monitoring, the prevention of accidental pollution and in the recent years especially on the coordinated approach to fulfilling the requirements of the so-called Water Framework Directive and improving flood control measures through the coordinated approach to fulfilling the requirements of the EC Directive on the assessment and management of flood risks (the so-calleds Flood Directive). In addition, since 1988 the International Commission for Protection of the Elbe participates in preparing and implementing the Magdeburg Workshop on protection of waters which is the most significant international expert and scientific event in the field of water protection in the Elbe River



Hydraulic structure Kamýk

The International Commission for Protection of the Elbe in its 24th session which took place in Vienna from II October to 12 October 2011, approved the documents "Summary of tasks according to the Water Framework Directive and the daughter Directive on environmental quality standards for the years 2010-2015, "Scheduled terms and objectives for the implementation of the Water Framework Directive at a national level in the Elbe River Basin in the years 2010-2015" and "International Programme of the Elbe Monitoring 2012". In the field of flood protection, the International Commission for Protection of the Elbe was informed on the progress of work in implementing the so-called Flood Directive, the results of workshop on preliminary assessment of flood risks in the International Elbe River Basin District and approved the text and publication of the document "Hydrological characteristics of low flows in the Elbe and its major tributaries". The Commission also agreed upon a preparation of this publication in English. In addition, the Commission took note of the documents "Summary of current knowledge on the impacts of climate change on the hydrological regime of the Elbe River Basin, especially with regard to the occurrence of floods" and "Criteria for evaluation of floods in the Elbe River Basin". In the field of accident prevention, the Commission was informed about the preparation of the revised version of the "International Warning and Alert Plan for the Elbe" and discussed the possibilities of realization of a stable accident profile in the border stretch of the Elbe. Furthermore, the ICPE was acquainted with the progress of work on the report "Surface waters used for navigation purposes".

In more detail, the information on the activities of the International Commission for Protection of the Elbe is available on the website www.ikse-mkol.org.

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

The International Commission for Protection of the Danube River was established on the basis of the Convention on Cooperation for Protection and Sustainable Use of the Danube River, which entered into force in 1998 and represents one of the most extensive international activities in the field of water protection, involving 14 states in the Danube River Basin and the EU. The seat of the Secretariat of the International Commission for Protection of the Danube River is in Vienna.

The 14th session of the International Commission for Protection of the Danube River took place from 13 December to 14 December 2011 in Vienna under the presidency of Ukraine. The session was attended by the delegations of all 15 parties to the Convention on Cooperation and Sustainable Use of the Danube River), chairmen of the individual expert groups, representatives of observer organizations and the Commission Secretariat staff members.

The ICPDR over the years of its existence has a number of international contacts and in 2007 in Brisbane, Australia it was awarded by the IRF the Thiess Riverprize for the most successful river commission. The awarded prize is associated with money which can only be used for transfer of experience to other commissions for protection of river basins. Based on agreement with the IRF and proposal of the ICPDR delegations it was decided to establish with the ICPDR an institution allowing cooperation between the commissions for protection of international river basins, which would also perform the function of the European offshoot of the IRF. One of its tasks would be to award European Riverprize. The ICPDR discussed the possibilities of establishing this institution and asked the relevant expert group to elaborate the proposal into a definite form.

In addition, the International Commission for Protection of the Danube River approved the auditors' report for the previous period, the budget and the membership fees for the next period.

The Commission discussed the work of the individual expert groups aimed especially at the fulfilment of the Water Framework Directive requirements and the preparation of reports 2012 and 2013 according to this directive. The activities relating to flood control and coordination of preparing the implementation of the Directive on the assessment and management of flood risks (2007/60/EC) were presented. The Commission discussed the issues relating to financing of audits of the laboratories and a preparation of the third Joint Survey of the Danube River, which will take place in 2013. The Commission also discussed the Danube Strategy, where it intends to get involved in the points concerning water quality, accident prevention and biodiversity and participate in a number of projects funded from external sources (the EU, WB, FAO, etc.). Worth mentioning is the intended project of fish pass through the Iron Gate dams.

In more detail, the information on the activities of the International Commission for Protection of the Danube River is available on the website www.icpdr.org.

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

The Agreement on the International Commission for Protection of the Oder River against Pollution is implemented through the International Commission for Protection of the Oder River against Pollution, which is seated in Wroclaw in the Republic of Poland.

The activities of the Working Groups in 2011 were discussed at the 14th plenary session of the International Commission for Protection of the Oder River against Pollution, held on 22 November 2011 in Wroclaw. The reports presented at this session included reports on the activities of the individual working groups aimed primarily at preparing the work plan for the International Commission for Protection of the Oder River against Pollution and the task schedule for the planning period 2010-2015, preparing the Terms of Reference for the project "Modelling of nutrient emissions for the International Oder River Basin District from point sources and various diffuse sources of pollution for the historical, current and future volumes of nutrient emissions", preparing the strategies to meet the objectives for significant water management issues, preparing the report "Preliminary assessment of flood risks in the International Oder River Basin District" accoding to the socalled Flood Directive and update of Emergency Plan including the International Warning and Alert Plan for the Oder River for the Events of Emergency Pollution.

Detailed information on the activities of the International Commission for Protection of the Oder River against Pollution is available on the website www.mkoo.pl.

## 12.3 International cooperation on transboundary waters

Cooperation of the Czech Republic on transboundary waters with the Republic of Poland, the Austrian Republic, the Slovak Republic and the Federal Republic of Germany is regulated by bilateral international or intergovernmental agreements. The fulfilment of these agreements is being ensured by bilateral committees for water management issues on transboundary waters, or by the authorized government representatives appointed for water management issues with the neighbouring states.

Although more than 30% of the state border are constituted by watercourses and water bodies (approx. 740 km of the total length of 2.290 km of the state border of the Czech Republic with the neighbouring states), border reaching waters are considered not only segments of watercourses or of their main branches that constitute or cross the state border, but also surface waters and groundwaters in the vicinity of the state border, where the water management measures implemented on the territory of one party would substantially affect water management conditions on the territory of the other party.

Cooperation on transboundary waters especially focuses on ensuring the stability of the state border in segments which are constituted by border reaching watercourses, regulation and maintenance of border reaching watercourses including construction and operation of structures on these watercourses, the protection of transboundary waters against pollution (including the respective monitoring, joint monitoring of the quality of transboundary waters, exchange of data and organization of warning and alert service in case of emergency), hydrology and flood warning service (including monitoring, joint measurements, exchange of data and organization of warning and alert service in case of emergency), cooperation in matters of the state border administration on transboundary watercourses, etc.

### Agreement between the Czech Republic and the Federal Republic of Germany on Cooperation on Transboundary Waters in the Field of Water Management

Cooperation in the field of water management is regulated by the "Agreement between the Czech Republic and the Federal Republic of Germany on Cooperation on Transboundary Waters in the Field of Water Management", which was signed on 12 December 1995 and became effective on 25 October 1997. The fulfilment of the Agreement with the Federal Republic of Germany takes places through the Czech-German Commission for Transboundary Waters (hereinafter referred to as the "CR-FRG Commission").

The 14th session of the CR-FRG Commission was held in Dresden in the Federal Republic of Germany from 21 October to 22 October 2011. The purpose of this session was to discuss and approve the results of the 13th session of the Standing Committee Bavaria (on 13-15 April 2011 in Český Krumlov in the Czech Republic) and the 13th session of the Standing Committee Saxony (on 7-9 June 2011 in Oybin in the Federal Republic of Germany).

The CR-FRG Commission further discussed other relevant issues of cooperation on transboundary waters, concerning especially the principles for direct cooperation of the relevant authorities and expert workplaces, Lists of Transboundary Waters, points of cooperation with the Standing Czech-German Border Commission and implementation of the Water Framework Directive on transboundary waters. In addition to these topics, both parties informed each other about the current state of preparations for a change of "Agreement between the Government of the Czechoslovak Socialist Republic and the Government of the German Democratic Republic on the adjustment of some of the common issues associated with the construction and operation of the water reservoir in the Föha stream valley near Rauschenbach" (concerning the new calculation of the elevation of upper level of the retention area of this reservoir), possibilities of funding for the project "Stable Accident Profile of the Elbe", etc.

The next, 15th session of the CR-FRG Commission will take place on 25-26 October 2012 in Prague in the Czech Republic.

The results of the meeting are included in the "Protocol on the 14th meeting of the Czech-German Commission for Transboundary Waters", which was signed by both representatives of the Parties, submitted to heads of the departments concerned for their standpoint and on the Czech party approved by the Minister of the Environment.

### Convention between the Government of the Czechoslovak Republic and the Government of the People's Republic of Poland on Water Management on Transboundary Waters

Cooperation with the Republic of Poland on transboundary waters is regulated by the Convention between the Government of the Czechoslovak Republic and the Government of the People's Republic of Poland on Water Management on Transboundary Waters, which was signed on 21 March 1958 and became effective on 7 August 1958.

The 13th meeting of the representatives of the governments of the Czech Republic and the Republic of Poland for cooperation in the field of water management on transboundary waters took place in Prague in the Czech Republic from 8 November to 10 November 2011. During this meeting, the results of activities of the individual joint working groups for the period from the 12th meeting of the government representatives were discussed and approved. The individual working groups were assigned tasks in the respective fields of cooperation and work plans for the next period were approved. The matters discussed included, among others, the issues of reducing flood risks to the Upper Opava River by means of the Nové Heřminovy water reservoir, the issues of effects of the scheduled Ratiboř water reservoir and the Kopytov stage, joint monitoring in the area of Intra-Sudetian Basin and the issues of the impact of Turów mine operations on surface waters and groundwaters (including the requirement of the Czech party to get current information to assess the impact of this mine on groundwaters), and also the current status of implementation of the Danube River-the Oder River-the Elbe River corridor. At the 13th meeting of the representatives of the Governments, both parties informed each other about the status of the preparatory work on the "Agreement between the Government of the Czech Republic and the Government of the Republic of Poland on Cooperation in the Field of Water Management on Transboundary Waters", which will replace the currently valid Convention of 1958. In 2011, both parties finished the national inter-departmental consultations on the planned update of the Convention and informed each other about the drafts of the new text to be discussed at the expert level. This agreement is expected to be signed in the second half of 2012.

Conclusions from the meeting of the government representatives are included in the Protocol on the 13th meeting, which was subjected to interdepartmental discussion and approved by the Minister of the Environment.

The next, 14th meeting of the representatives of the governments of the Czech Republic and the Republic of Poland is scheduled to take place in November 2012 in the Republic of Poland.

## Agreement between the Czechoslovak Socialist Republic and the Republic of Austria on Regulation of Water Management Issues on Transboundary Waters

The 19th session of the Czech-Austrian Commission for Transboundary Waters (hereinafter referred to as the CR-A Commission) took place in St. Lorenz/Mondsee in the Republic of Austria from 14 June to 17 June 2011. The purpose of this session of the CR-A Commission was to discuss the individual areas of mutual cooperation in water management on transboundary waters in accordance with the "Agreement between the Czechoslovak Socialist Republic and the Republic of Austria on Regulation of Water Management Issues on Transboundary Waters" of 7 December 1967 and effective from 18 March 1970.

The CR-A Commission at its 19th meeting discussed the results of monitoring of surface waters (especially the report on the results of joint monitoring of the Pulkava River and the Dyje River affected by the Austrian chemical plant in Pernhofen), the evaluation of construction work on transboundary watercourses, including final settlement of accounts relating to the joint work,

the state of proceedings regarding the extension of water management permit for the Vranov hydropower plant, the issues of optimization of its work, etc.

The result of the meeting of the CR-A Commission is included in the mutually agreed and signed "Protocol on the 19th meeting of the Czech-Austrian Commission for Transboundary Waters", which was subjected to interdepartmental discussion and approved by the Minister of the Environment.

The next, 20th meeting of the CR-A Commission will take place on 30 - 31 May 2012 in Prague.

## Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Cooperation on Transboundary Waters

The 11th session of the Czech-Slovak Commission for Transboundary Waters (hereinafter referred to as the "CR-SR Commission"), established on the basis of the "Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Cooperation on Transboundary Waters" that was signed and became effective on 16 December 1999, was held in Oščadnica in the Slovak Republic from 18 May to 20 May 2011.

The CR-SR Commission at its 11th meeting approved the reports on activities of its Working Groups in 2010 and approved work plans for 2011. In addition to the cooperation with the Standing Czech-Slovak Border Commission (under the Ministry of the Interior), evaluation of joint monitoring of surface waters, hydrological and navigation issues, the CR-SR Commission discussed the current status of joint Czech-Slovak projects focusing on flood protection and projects aimed at improvement of the existing systems of transfer of the hydrological data in cross-border catchment area of the Morava River and the Dyje River and more effective cooperation between the relevant water management control centres. In terms of the planned project "Extension of Navigability of the Otrokovice - Rohatec Waterway", both parties informed each other about the course of discussions to reach the "Agreement between the Government of the Czech Republic and the Government of the Slovak Republic on Temporary Use of Part of the Territory and Property of the Slovak Republic for the Construction and Operation of the Project "Extension of Navigability of the Otrokovice - Rohatec Waterway" on the transboundary watercouse Radějovka (Radejovka) in the cadastral territory of the town of Skalice and the municipalities of Sudoměřice and Rohatec".

The result of the meeting is included in the "Protocol on the 11th meeting of the Czech-Slovak Commission for Transboundary Waters", which was subjected to interdepartmental discussion and approved by the Minister of the Environment.

The next, 12th meeting of the CR-SR Commission was agreed to take place on  $15-16\,$  May 2012 in Prague in the Czech Republic.

Trilateral meeting of the government representatives of the Czech-Austrian Commission for Transboundary Waters, the Czech-Slovak Commission for Transboundary Waters and the Slovak-Austrian Commission for Transboundary Waters

The 5th meeting of the government representatives of the Czech-Austrian Commission for Transboundary Waters, the Czech-Slovak Commission for Transboundary Waters and the Slovak-Austrian Commission for Transboundary Waters took place on 5 December 2011 in Pavlov in the Czech Republic.

Although these meetings do not take place on the basis of existing international agreement, the effort of all three parties is to make a joint meeting once a year to discuss the topics in the field of cooperation on transboundary waters, especially in the Morava River and the Dyje River confluence area. At this 5th meeting, the government representatives informed each other of the following jointly planned or already implemented projects co-financed under cross-border programmes of the European Union:

- Czech-Austrian project "Nature-friendly Flood Control Measures in the Morava River and the Dyje River Confluence Area" (polder Soutok) and other projects in this area;
- Czech-Slovak project "Joint Flood Control Measures on Both Banks of the Morava River",
- 3. Czech-Austrian project "Flood Prediction System for the Morava Dyje Rivers,
- Slovak-Austrian project focusing on the use of the Dyje River and the Morava River for recreational boating,
- 5. The concept of harmonization of flood protection in transboundary river basins CEFRAME.

The result of the trilateral meeting of the government representatives is taken into account by all parties in the drafting of protocols for the upcoming meeting of the relevant bilateral commissions for transboundary waters.



The Šembera River in Český Brod



Hana Schovánková – 9 years Art club "Zdeňka", Kladno, Středočeský kraj region

# 13. Research and development in water management

# 13.1 Research and development in the competence of the Ministry of Agriculture

In 2011, the Ministry of Agriculture provided specialpurpose funding for research and development projects in the field of water management in the amount of almost CZK 53 million.

In 2011, the funds to support water management R&D amounted in total to CZK 52,878 thousand. The R&D projects launched in 2007 were funded by the amount of CZK 3,646 thousand, the R&D projects launched in 2008 were granted support amounting to CZK 28,030 thousand, the R&D projects launched in 2009 were granted support amounting to CZK 15,499 thousand and the R&D projects launched in 2010 were granted support amounting to CZK 2,324 thousand. In 2011, three new R&D projects tackling the issues of water management were launched and were granted support amounting to CZK 3,379 thousand. R&D projects are primarily aimed at soil and water protection in sustainable development of the agricultural sector, landscaping, revitalization and protection of cultural landscape, forests and water bodies, rationalization of water management and addressing the impacts of climate change.

An overview of the individual R&D projects in progress is shown in a summarized form in table 13.1.1. Publicly accessible data on these projects are available on the website of the Council for Research, Development and Innovations at www.vyzkum.cz in the section Information System R&D&I (the Central Register of R&D Projects). The information on the results of the R&D projects is also available on the same website in the Information Register of R&D Results. Other information on the research and development

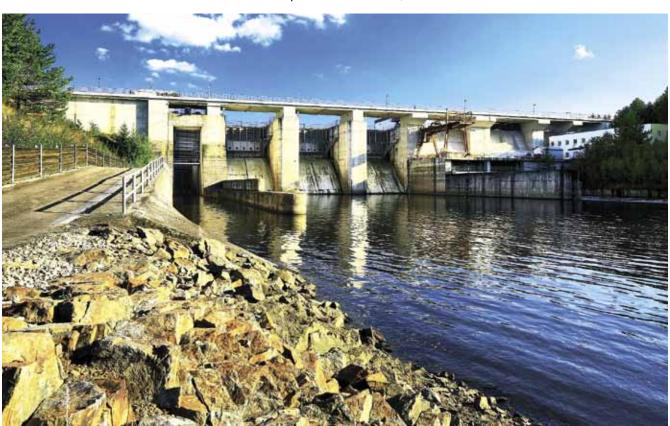
in the field of water management can also be found on the website of the National Agency for Agricultural Research with the Ministry of Agriculture at www.nazv.cz in the Infobanka section.

Water management R&D projects resulted from public tenders called under the research programmes of the Ministry of Agriculture, namely the Programme of Research in Agricultural Sector 2007–2012 and the Research in Agricultural Complex 2009–2014. They also include sub-programmes, research trends or objectives relating to water management issues.

The Programme of Research in Agricultural Sector 2007–2012 includes the sub-programme Effective Approaches in Agricultural Sector, where one of the research trends is the Sustainability and Enhancement of Water Resources and Reducing the Impacts of Climate Change. One of the research trends under the sub-programme Effective and Friendly Management Practices is the research trend Interactions between Water, Soil and Environment.

The programme of Research in Agricultural Complex 2009–2014 includes the sub-programme Rural Development through Sustainable Management of Natural Resources, where one of the objectives of this sub-programme is to develop water management practices with regard to assumed climate change risks and to innovate waste water treatment techniques.

In 2011, the Research Institute for Soil and Water Reclamation, public research institution continued to conduct the work under research scheme No. MZE0002704902, Integrated Systems of Soil, Water and Landscape Protection and Use in Agriculture and Rural Development. Under this scheme, the chapters relating to water management received support in the amount of CZK 14.602 thousand.



Hydraulic structure Hněvkovice

Table 13.1.1
Research and development projects in the field of water management financed from the budget chapter of the Ministry of Agriculture in 2011

				funds
project No.	name of project	from - to	coordinator	(thousands of CZK)
QH71015	Minimization of risks of the occurrence of cyanobacteria metabolites in technological processes in fishing sector	I May 2007 31 December 2011	Mendel University in Brno	1,261
QH71201	Reliability and safety of water management structures in changing climate conditions	I May 2007 31 December 2011	Czech Technical University in Prague	1,203
QH72085	Differentiation of erosion control measures according to soil erodibility and rain erosivity	I May 2007 31 December 2011	Czech Agricultural University in Prague	1,182
QH81012	The use of aeration technologies for the reduction of cyanobacteria resting phases and nutrient bioavailability in reservoir sediments	I January 2008 31 December 2011	Institute of Botany of the Academy of Sciences of the Czech Republic, public research institution	1,863
QH81046	Optimization of the bio-manipulation effect of predatory fish in ecosystems of water reservoirs	I January 2008 31 December 2012	Biology Centre of the Academy of Sciences of the Czech Republic, public research institution	1,464
QH81170	Multidisciplinary evaluation of impacts of special territorial protection of hydrologically important areas in the Czech Republic	I January 2008 31 December 2012	Czech Agricultural University in Prague	1,615
QH81200	Optimization of water regime in the landscape and increasing its retention capacity through application of compost from biologically degradable waste on arable land and permanent grassland	l January 2008 31 December 2012	Research Institute of Agricultural Engineering, public research institution	1,847
QH81326	New cultivation technologies in potato production aimed at higher efficiency of fertilization and water protection	l January 2008 31 December 2012	Potato Research Institute Havlíčkův Brod	1,299
QH81331	Research of adaptation measures to eliminate the impacts of climate change in the regions of the Czech Republic	I January 2008 31 December 2012	T. G. Masaryk Water Management Research Institute, public research institution	1,425
QH82078	Water retention in floodplains and possibilities of its enhancing	I January 2008 31 December 2011	Daphne CR – Institute of Applied Ecology	2,200
QH82083	Potential and limits of the use of river and fishpond sediments in agriculture	l January 2008 31 December 2011	Research Institute for Soil and Water Reclamation, public research institution	1,271
QH82089	Non-production function of soils in the Czech Republic in relation to their production function, their assessment and their influence on soil, water and landscape protection	I January 2008 31 December 2012	Research Institute for Soil and Water Reclamation, public research institution	712
QH82090	Changes in soil properties due to grassing, afforestation or in the long-term abandoned arable land, with impacts on soil, water and landscape protection	l January 2008 31 December 2012	Research Institute for Soil and Water Reclamation, public research institution	760
QH82095	The impact of land use type location on runoff and wash loss of selected substances	l January 2008 31 December 2012	Research Institute for Soil and Water Reclamation, public research institution	2,346
QH82096	Development of conceptual model for generation of groundwater vulnerability synthetic maps and its comparison with model DRASTIC	l January 2008 31 December 2012	Research Institute for Soil and Water Reclamation, public research institution	1,516
QH82098	Analysis of changes in land use in source areas of agricultural area pollution using remote sensing data	I January 2008 31 December 2011	Research Institute for Soil and Water Reclamation, public research institution	585
QH82106	Recultivation as a tool for landscape water regime function regeneration after opencast brown coal mining	l January 2008 31 December 2012	University of South Bohemia in České Budějovice	1,693
QH82117	Environment friendly and effective fishpond management with maximum utilization of current trophic potential and maintaining good quality of water and fish production	l January 2008 31 December 2012	University of South Bohemia in České Budějovice	2,492
QH82126	Harmonization of landscaping, hydrological and production function of hedgerows and terraces for diversification of activities in countryside	l January 2008 31 December 2011	Jan Evangelista Purkyně University in Ústí nad Labem	1,615

QH82191	Optimization of batching and placement of organic matter into soil with the aim to reduce surface water runoff during intensive rainfall	l January 2008 31 December 2012	Research Institute of Agricultural Engineering, public research institution	1,143
QH82283	Research of interaction of water, soil and environment from the viewpoint of barnyard manure management in sustainable agriculture	l January 2008 31 December 2012	Research Institute for Crop Production, public research institution	2,184
QH91247	Possibilities of mitigation of current impacts of climate change through enhanced accumulation capacity in the Rakovnický stream catchment area (pilot project)	l January 2009 31 December 2011	T. G. Masaryk Water Management Research Institute, public research institution	1,312
QH91257	Socio-economic analysis of impacts of climate change in relation to water management in the Czech Republic – the effectiveness of costs of water management services and tools for their regulation	l January 2009 31 December 2011	T. G. Masaryk Water Management Research Institute, public research institution	1,177
QH92034	Identification of infiltration areas in selected river basins by means of water vegetation stress	I January 2009 31 December 2011	Research Institute for Soil and Water Reclamation, public research institution	1,304
QH92073	Mountain forests – basic ecosystems influencing water balance, floods and drought periods in the landscape	l January 2009 31 December 2011	Research Institute for Forestry and Game Management, public research institution	860
QH92086	Methodology of drafting and implementing infiltration and capture measures within rehabilitation of hydrological conditions and land use in the landscape	l January 2009 31 December 2011	Czech Agricultural University in Prague	936
QH92091	Optimization of recultivation and remediation methods for landscape units devastated by mining, with emphasis on protection of waters and ecological stability	l January 2009 31 December 2011	Czech Agricultural University in Prague	972
QH92298	System of nature friendly erosion control and flood control measures and its optimization in the process of land consolidation	l January 2009 31 December 2011	University of South Bohemia in České Budějovice	834
Q191 C008	Optimization of drafting of technical erosion control measures	1 June 2009 31 December 2013	Research Institute for Soil and Water Reclamation, public research institution	1,761
Q191 C054	Soil Climate Atlas of the Czech Republic – definition of thermal and hydric regimes and their impact on productive capacity of soils	I June 2009 31 December 2013	Mendel University in Brno	1,217
Q192A012	The assessment of implementation of erosion control and water management facilities in comprehensive land adaptations in terms of farming landscape protection and creation	l June 2009 31 December 2013	Research Institute for Soil and Water Reclamation, public research institution	1,011
Q192A139	Research of methods improving the efficiency of water management of small reservoirs with respect to risks posed by expected climate change	l June 2009 31 May 2012	Czech Technical University in Brno	851
QI92A207	Recovery and long-term nature friendly management of watercourse bank vegetation	I June 2009 31 December 2013	Silva Taroucy Research Institute for Landscape and Ornamental Gardening, public research institution	3,264
Q1102A265	Determination of the proportion of phosphorus in eutrophication of standing surface water bodies at risk	l January 2010 31 December 2013	Czech Technical University in Prague	2,324
QIIIIC034	Influence of livestock grazing on soil properties, water quality and quantity and species biodiversity in the landscape	l January 2011 31 December 2014	Research Institute for Soil and Water Reclamation, public research institution	1,371
Q1112A132	Research of measures to ensure drinking water supply in the period of climate change	I January 2011 31 December 2014	Mining University - Technical University of Ostrava	935
Q1112A174	Forestry and agricultural aspects of management of water component in the landscape	l January 2011 31 December 2014	Research Institute for Forestry and Game Management, public research institution	1,073
Total				52,878

# 13.2 Research and development in the competence of the Ministry of the Environment

In 2011, the main research institution in the competence of the Ministry of the Environment, dealing with the issues of water protection was the T. G. Masaryk Water Management Research Institute, public research institution. Another institution dealing with important research projects or participating, to a large extent, in these projects was the Czech Hydrometeorological Institute.

The year 2011 was the last year when the Ministry of the Environment supported R&D&I research projects. Therefore, all activities in this year were focused on the successful completion of all research activities within the Ministry of the Environment.

The year 2011 was the seventh and the last year of the implementation period of research scheme No. MŽP0002071101 – "Research and Protection of Hydrosphere – research of relations and processes in the aquatic compartment of the environment, with particular focus on the impact of anthropogenic pressures, and on the sustainable use and protection, including legislative tools". The subsidy is granted by the Czech Republic through the Ministry of the Environment, the beneficiary was the T. G. Masaryk Water Management Research Institute, public research institution. In 2011, the Ministry of the Environment was responsible for the execution of scientific and research projects in the field of water management (including related areas) under the programme of the Government Council for Research and Development. These projects are shown in table 13.2.1.



The Prunéřovský stream

Table 13.2.1

R&D&I projects in the field of water management financed from the budget chapter of the Ministry of the Environment in the year 2011

Project No.	Name of the project	From – to	Coordinator	Funds (thousands of CZK)
SP/1c2/121/07	Maps of flood risks in the Czech Republic	2007–2011	T. G. Masaryk Water Management Research Institute, public research institution	3,231
SP/Ic4/I6/07	Research and implementation of new flood and runoff prediction tools in the framework of ensuring flood prediction and warning system in the Czech Republic	2007–2011	Czech Hydrometeorological Institute	2,143
SP/2e7/229/07	Anthropogenic pressures on the status of soils, water resources and water ecosystems in the Czech part of the international Elbe River Basin	2007–2011	T. G. Masaryk Water Management Research Institute, public research institution	18,269
VZ-MZP0002071101	Research and Protection of the Hydrosphere  - research of relations and processes in the aquatic compartment of the environment, with particular focus on the impact of anthropogenic pressures and on the sustainable use and protection, including legislative tools	2005–2011	T. G. Masaryk Water Management Research Institute, public research institution	50,161
SP/1a6/108/07	Refinement of the existing estimates of the impacts of climate change in the sectors of water management, agriculture and forestry and proposals of adaptation measures	2007–2011	Czech Hydrometeorological Institute	4,706
SP/1a6/151/07	Assessment of the impacts of climate change on the hydrological balance and design of practical measures to mitigate such impacts	2007–2011	Czech Geological Survey	4,758
Total				83,268

Source: MoE

In 2011, the execution of the research project No. SP/Ic2/I21/07 "Maps of Flood Risks in the Czech Republic", funded by the Miistry of the Environment, was completed. The project was based on elaboration of partial issues to complete the so far used or proposed methods of risk assessment of flood plain areas and the proposal for effective fulfilment of the obligations of the Czech Republic resulting from the Directive 2007/60/ EC on the assessment and management of flood risks. The project focused on the verification of applicability of current data sources for effective description of threat, vulnerability, assessment of potential damage and expressing flood risks. This was conducted along with update and verification of partial methodologies for potential damage assessing and flood risk expressing. The vectorization of the individual drawings of landuse planning documentation of municipalities in the pilot basins of the Lužnice River and the Nežárka River was completed. The source documents were used to be incorporated into a map of flood risks on the basis of matrix for individual municipalities in the pilot basin. Field investigation in the remaining part of the pilot basin of the Lužnice River from the town of Tábor as far as confluence with the Vltava River was carried out.

The project No. SP/Ic4/16/07 "Research and implementation of new flood and runoff prediction tools in the framework of ensuring flood prediction and warning system in the Czech Republic" focused in 2011 on research of the influence of inputs of assembly systems for probabilistic weather forecast on hydrological modelling. The project further focused on the development of a methodology for long-term probabilistic hydrological predictions, the assessment of probabilistic prediction outputs applicability in water management practice, the development of a robust method of estimating runoff from torrential rains, the development of methods to determine and measure snow cover parameters with regard to the needs of flood prediction and warning system, and the compilation of flood risk guide for the needs of flood control bodies and the public.

The project No. SP/2e7/229/07 "Anthropogenic pressures on the status of soils, water resources and water ecosystems in the Czech part of the international Elbe River Basin" focused on the

identification of pressures caused primarily by human activity on the quality of water resources, soils and water ecosystems, including the description of the changes in habitats and their subsequent impact on communities of aquatic organisms. With regard to the scope of the issues dealt with, this project was divided into a series of nine separate special blocks. Other research institutions participating in this project included the Research Institute of Fish Culture and Hydrobiology of the University of South Bohemia, the Czech Geological Survey and the Czech Technical University in Prague, the Faculty of Civil Engineering.

Project No. SP/la6/108/07 "Refinement of existing estimates of the impacts of climate change in the sectors of water management, agriculture and forestry and proposals of adaptation measures". The project focused on the process of reducing the risks of the impacts of climate change, especially on the issue of adaptation measures comprehensively, with the aim to orientate it in the next few years primarily to the sectors of water management, agriculture and forestry. Current knowledge of sectoral impacts of climate change has shown that in the conditions of the Czech Republic the most vulnerable is the sector of water management and the ongoing changes in the hydrological regime are subsequently reflected in the sectors of agriculture and forestry.

Project No. SP/Ia6/I5I/07 "Assessment of the impacts of climate change on the hydrological balance and design of practical measures to mitigate such impacts". The project monitored the impacts of climate change on the hydrological balance, extreme hydrological events and water resources in forest catchments of GEOMON network. Forest in the conditions of the Czech Republic is the best approximation to the natural ecosystem and a suitable environment allowing to monitor the effects of extreme hydrological situations. With regard to the fact that in spruce monocultures the naturalness of the ecosystem is disturbed and forest is prone to acidification, also critical loads of selected chemical elements were monitored and assessed.

The execution of all of the above mentioned projects was completed in 2011.



Overflows the Ohře River in Vršovice

## List of acronyms in text

biochemical five-day oxygen demand
Council of Europe Development Bank
Cohesion Fund
chemical removal of phosphorus
chemical oxygen demand
Czech State Standard
I,I,I-trichloro-2,2-bis(p-chlorophenyl) ethane
dissolved inorganic salts
denitrification
European Agricultural Fund for Rural Development
European Commission
European Economic Community
environmental impact assessment
European Investment Bank
Environmental Quality Standards
European Regional Development Fund
European Union
flood activity degree
hexachlorocyklohexan

ISPA	Instrument for Structural Policies for Pre-Accession
MoA	Ministry of Agriculture
МоЕ	Ministry of the Environment
N	nitrification
N <sub>-inorganic</sub>	inorganic nitrogen
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne (sectoral classification of economic activities according to Eurostat)
OECD	Organization for Economic Co-operation and Development
OPE	Operational Programme Environment
РСВ	polychlorinated biphenyls
PE	population equivalent
Q <sub>a</sub>	long-term annual average flow
Q <sub>m</sub>	long-term monthly average flow
R&D	research and development
R&D&I	research, development and innovation
s. e.	state enterprise
VAT	value added tax



The Chrudimka River in Rváčov

## Important contacts in water management

## **Ministry of Agriculture**

Těšnov 65/17, Praha I, 117 05, www.eagri.cz

### **Ministry of the Environment**

Vršovická 1442/65, Praha 10, 100 10, www.mzp.cz

## Elbe River Board, state enterprise

Víta Nejedlého 951/8, Hradec Králové, 500 03, www.pla.cz

## VItava River Board, state enterprise

Holečkova 106/8, Praha 5, 150 24, 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, 701 26, www.pod.cz

## Morava River Board, state enterprise

Dřevařská 932/II, Brno, 602 00, www.pmo.cz

## Forests of the Czech Republic, state enterprise

Přemyslova 1106/19, Hradec Králové, 501 68, www.lesycr.cz

## **Agricultural Water Management Administration**

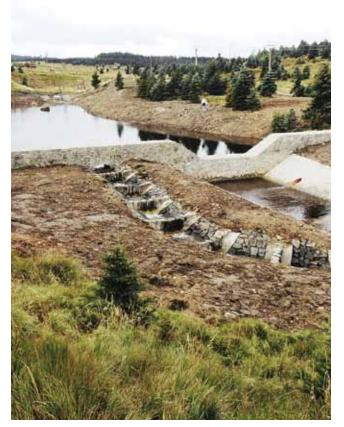
Hlinky 60, Brno, 603 00, www.zvhs.cz

## Czech Hydrometeorological Institute

Na Šabatce 2050/17, Praha 412-Komořany, 143 06, www.chmi.cz

## T. G. Masaryk Water Management Research Institute, public research institution

Podbabská 2582/30, Praha 6, 160 00, www.vuv.cz



Sphagnum in the Fláje stream



The Orlice River in Malšovice

Notes: