



Annual Report 2016

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

Prague 2017

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1 Introduction

The year 2016 was like previous years characterized by many changes in the environment where the T. G. Masaryk Water Research Institute, public research institution (Institute) operates. Most of these changes, both inside and outside the Institute, can be characterized as a positive change. These changes can be considered as a stabilizer for the further development of water management in the Czech Republic.

From a hydrological point of view, year 2016 was not so dry year compared to 2015; however the activities of the Institute were directed to the solution of the problems of drought. A series of meetings of the interdepartmental commission Water-Drought took place. The output of the commission activity is a fulfillment of the Government Resolution No. 620/2015. The resolution defines many tasks and activities that will be fulfilled by the Institute in the field of combating drought in 2016–2018.

In 2016, the first comprehensive volume of journal Water Management Technical and Economical Information – VTEI came out as the restored separate journal. Six numbers were issued, of which two were monothematic and were devoted to seminatural flood management measures and to the impacts of climate change on the hydrological balance. In this regard, meetings of editorial board of the VTEI Journal, scientific board of the VTEI Journal and editorial board of the TGM WRI, p.r.i., took place. From the long-term perspective, stabilization of the staffing of the Institute continued regarding capacity and the emerging activities in the areas of the Institute operation.

Fourth informal meeting of experts in water resource management took place in cooperation with Heineken, SWECO Hydroprojekt, VRV, Aquatis and Geotest in the Institute on 26th May 2016. The experts from different organizations had the opportunity to discuss current issues in an informal atmosphere. Open day was organized in cooperation with the Ministry of the Environment and many conferences and seminars were organized by the Institute.

In 2016, the Institute participated in projects funded by national and international funds. The expert support for the Ministry of the Environment took place based on frame contract. The projects financed by other providers were carried out. The other providers were: Technological Agency of the Czech Republic, Grant Agency of the Czech Republic, Ministry of the Interior, Ministry of Agriculture and Ministry of Culture. Projects financed by the Norway Grants that started in 2015, were finalized. However, the financial issues are significant: e.g. issues of cofinancing, pre-financing from own sources, the extent of eligibility of costs (overheads and costs of the coordination and management of projects) etc.

Many international meetings took place on the topic of the cooperation in water resources management and environment protection in 2016. Members of national governments participated in these meetings; e.g. ministers of the environment of Slovenia, Israel and Moldova.

We managed to get a major project Water for Prague, financed by the operational programme Prague – pole of growth and the Institute is also involved in a wide range of commercial contracts and projects, which are the only source for possible co-financing of the research projects. Major part of the activity was dedicated to the support of the research and development from our founder. All the necessary steps have been made to the Ministry of the Environment of the Czech Republic would become a provider of institutional funds starting 2017 and could affect the next direction of research in the field of water management in accordance with the long-term concept of the research and development of the Ministry of the Environment.

Two partial hydraulic models of Troja Valley were built. The models allow to investigate compensatory measures as a part of flood protection of Prague. The compensatory measures are connected with construction of Central Wastewater Treatment Plant. Additionally, the inputs to mathematical model of flood protection of Prague were made more precise. These

models can be used in the future e.g. for proposals on flood protection of the Prague zoological garden.

In conclusion, I would like to thank all, who contributed in 2016 to the fact that T. G. Masaryk Water Research Institute, p.r.i., could end up in the black despite the aforementioned problems with co-financing and pre-financing of projects. Therefore, I would like to thank all the researchers, but also to workers that provide research infrastructure.

Mgr. Mark Rieder
the director of the public research institution



2 Information on Institute Bodies Members and Activities

2.1 Institute bodies and their members

a) Director: Mgr. Mark Rieder (appointed as a director since 1st January 2014)

b) The Council of the TGM Water Research Institute, p.r.i.:

Ing. Petr Tušil, Ph.D., MBA (TGM WRI, p.r.i., Ostrava Branch) – chairman,
RNDr. Dana Baudišová, Ph.D. (TGM WRI, p.r.i., Prague) – deputy chairman,
Ing. Eduard Hanslík, CSc. (TGM WRI, p.r.i., Prague),
Ing. Anna Hrabánková (TGM WRI, p.r.i., Prague),
Ing. Jaroslav Beneš (River Board Povodí Vltavy, state enterprise, Prague),
Ing. Rut Bízková (self-employed, Prague),
Mgr. Vít Kodeš, Ph.D. (CHMI, Prague).

Secretary of the Council of TGM WRI, p.r.i., is Ing. Michal Vaculík, TGM WRI, p.r.i.

c) Supervisory Board

Ing. Jan Landa (chairman) - Ministry of the Environment of CR,
Prof. Ing. Jiří Wanner, DrSc. (deputy chairman) – Institute of Chemical Technology, Prague,
Ing. Berenika Peštová, Ph.D. – Ministry of the Environment of CR,
Ing. Vladimír Sassmann – Ministry of the Environment of CR,
Mgr. Ladislav Faigl – Ministry of Agriculture of CR,
Prof. RNDr. Jakub Hruška, CSc. (Czech Geological Survey),
Ing. Roman Dvořák (TGM WRI, p.r.i.).

Secretary of the Council of TGM WRI, p.r.i., is Ing. Jan Rykl from TGM WRI, p.r.i.

2.2 The Report on activity of the Council of the TGM Water Research Institute, p.r.i., in 2016

The members of the Council of the TGM Water Research Institute, public research institution (TGM WRI Council) have not changed in 2014.

Three meetings of the TGM WRI Council took place in 2016. The most important conclusions of these meetings were as follows:

TGM WRI Council discussed and approved the 2015 Annual Report in accordance with section 18 article (2) letter e) of Act No. 341/2005 Coll., about public research institutions, as amended, in the structure required by Act No. 341/2005 Coll., On Public Research Institutions, as amended, pursuant to Section 30 article (4) letter a) to g). The financial statements for 2015 were also discussed and approved.

- TGM WRI Council approved proposed budget of the institute for the 2016 period in accordance with section 18 article (2) letter e) of Act No. 341/2005 Coll., about public research institutions, as amended. The budget was created as a balanced. Investment plan was also approved.
- TGM WRI Council approved the adjustment of the organizational protocol of TGM WRI, p.r.i. In accordance with Section 18 article (2) letter d) and Section 20 article (1) letter c) of Act No. 341/2005 Coll., On Public Research Institutions, as amended.
- The proceedings are made from every meeting. After ten days of approval procedure by members of the TGM WRI Council and by the director of TGM WRI, p.r.i., the pro-

ceedings are at disposal to all employees in internal information database of the Institute.

Fifth and last year of activity of the newly elected TGM WRI Council was relatively administratively calm according to its rights and duties which were given to the Council by Act No. 341/2005 Coll., about public research institutions, as amended, in comparison with previous years. TGM WRI Council fulfilled all its duties in 2016. The duties are defined by the aforementioned act. TGM WRI Council also dealt in detail with current status and development of selected economical parameters of the 2016 at each meeting.

2.3 The Report on activity of the Supervisory Board of the TGM Water Research Institute, p.r.i., in 2016

In 2016, four meetings of the Supervisory Board took place on 10th March, 20th May, 29th September and 15th December. Deputy Director for Research and Professional Activities Ing. Petr Bouška, Ph.D., participated in 26th meeting on 10th March. Director of TGM WRI, p.r.i., Mgr. Mark Rieder participated in remaining three meetings.

The Supervisory Board, after discussion, considered:

- the draft of 2015 Annual report and recommended its approval by the Council of TGM WRI, p.r.i.,
- results of economic activities of TGM WRI, p.r.i., in 2015 that are described in 2015 Annual Report with no objection,
- the draft of the budget of TGM WRI, p.r.i., for 2016.

The Report on activity of the Supervisory Board of the TGM Water Research Institute, p.r.i., in 2015 was processed and transferred to be included in 2015 Annual Report.

The Supervisory Board presented the Report about its ninth year of activity (from 1st June 2015 to 31st May 2016) to the founder and Mgr. Mark Rieder within the meaning of paragraph 19 article (1) letter I) of Act No. 341/2005 Coll., as amended.

The Supervisory Board also dealt with current issues of TGM WRI, p.r.i., activities, e.g. adjustment of the organizational protocol of TGM WRI, p.r.i. (dissolution of the Centre for Waste Management), the contract on the audit of the financial statements for the 2016 with the new auditing firm, the economic management of TGM WRI, p.r.i., in 2016, the issues of public research institutions funding and theft (sale) of buildings and land at Horní Soběšovice (cadastral zone) that are owned by TGM WRI, p.r.i.

3 Profile of the Institute

TGM WRI was included to the Register of public research institutions, administered by the Ministry of Education, Youth and Sports, on 1st January 2007.

The activities of the Institute are based on the founding deed of the public research institutions given by Provision No. 12/06 of the Ministry of the Environment from 12th December 2006, as amended by Provision No. 2/11 of the Ministry of the Environment on publication of the full wording of the founding deed from 31st May 2011.

Authorities of the Institute according to article 16 of Act No. 341/2005 Coll., as amended, are as follows:

- the Director is an official representative competent to make decisions within the framework of the public research institution, with the exception of issues in competence of the Council of the Institute, the Supervisory Board or the founder of the Institute,
- Council of the T. G. Masaryk Water Research Institute, public research institution,
- Supervisory Board of the T. G. Masaryk Water Research Institute, public research institution.

The main mission of the Institute is:

- the research of the status, use and changes of water ecosystems and their linkages with landscape and related environmental risks; waste and packaging management,
- professional support of the water protection; prevention of flood risks and waste and packaging management based on the above mentioned research.

Activities of TGM WRI are categorized into main activity and additionally activity according to the founding deed.

The main activity includes:

■ hydrological, hydrogeological and hydraulic research ■ research of water resources, protection of water and protection of river basins ■ research in water chemistry, toxicology and radiology ■ research in water biology and microbiology ■ research of processes caused by water pollution and elimination of pollution ■ research of the status of water and water bodies and protection of aquatic ecosystems ■ research of methods for identification and evaluation of water status ■ research of ecological relations of water in a landscape ■ research of monitoring methods, field measurements and sampling techniques including technical instruments ■ research of methods in analytical chemistry including technical instruments ■ research of methods for information processing, development and use of databases including geographical information systems ■ economic research in relation to water and its use as a component of the environment ■ research in remediation of river systems and aquatic remediation of damaged landscape ■ research for selection of water biotopes suitable for renewal or remediation and management of databases of relevant sites ■ research for protection against harmful impacts of water ■ research in water management planning, water balance and use of water ■ research in waste management, composition and quality of waste, including dangerous waste and its impact on aquatic environment ■ research of risks of landfills and contaminated sites for the water environment ■ research of management of packaging and packaging waste ■ research, development, application and evaluation of technological methods for waste management including assessment of waste production and waste management ■ development of research infrastructure.

Within its additional activity the Institute ensures:

- expert opinions, positions, assessments and analyses in the area of the main activity
- observations, field measurements, sample analyses, chemical analyses in the area of the main activity
- international cooperation, activities in a framework of relevant thematic strategies in the area of the main activity
- cooperation with universities, institutes of the Academy of Sciences and other research institutions in the area of the main activity
- publishing and dissemination of information in the area of the main activity
- proposing of parameters of good ecological status of water
- proposing of programmes for reduction of pollution of surface water by dangerous harmful substances and priority dangerous substances
- assessment of sensitive and vulnerable zones, as well as surface water suitable for life and reproduction of native fish species and other aquatic fauna, protected areas of natural accumulation of water and bathing surface water
- proposing and monitoring of areas of natural accumulation of water in the area of the main activity
- proposing protection measures for water resources
- maintaining registry of watercourses and water reservoirs, protection zones of water supply reservoirs and water supply groundwater resources
- maintaining thematic water management cartography
- assessment and evaluation of surface water and groundwater regime in relation to status of use of water resources
- determination of minimum residual flows and minimum groundwater levels
- expert support to preparation of district river basin management plans
- operation of reference laboratories for all components of the environment
- proficiency testing of hydroanalytical laboratories for chemical, biological, microbiological, toxicological and radiochemical analytical methods and organizing intercalibration laboratory testing in the area of the environment
- methodological guidance for hydroanalytical laboratories and unification of their practices
- expert support to prevention of major accidents involving chemical substances and preparations,
- participation in operating the permanent and emergency component of the national radiation monitoring network
- development and operation of the evaluation system of status and potentials of water bodies and reference conditions of water bodies
- establishment and operation of monitoring network for observation of surface water and groundwater except their quality
- strategic and organizational provisions of activities for evaluation and assessment of status of surface water and groundwater
- maintaining and updating registries of water of public administration information system
- assessment of technologies and evaluation of operation of technological installations for water treatment and wastewater treatment
- evaluation of effectiveness of remediation measures of river systems
- expert support to the international cooperation of CR within the framework of bilateral and multilateral agreements and conventions in the area of water protection
- preparation of background documents necessary for meeting the obligations towards the European Union and documents included in reports on implementation of directives in the area of water protection and waste management according to the requirements of the European Community
- evaluation of waste management methods for individual waste types
- operating the waste management information systems and maintaining registry of production and management of waste and packaging
- evaluation of analytical methods and quality of waste, evaluation of efficiency of waste treatment technologies including dangerous waste
- carrying out the function of the National inspection authority for proper laboratory practice
- expert support to updating and evaluation of waste management plans
- provision of information on the status of the environment in the area of waste management
- carrying out the function of the expert institution for professional and registering activities
- operating the calibration center for hydraulic measurements
- carrying out the function of the center for evaluation of competency for calibration of measuring instruments for water discharge in conditions of free water level
- operation of a Testing laboratory for water management equipment.

Apart from the above listed functions, the Institute carries out also other activities according to Provision No. 12/06 of the Ministry of the Environment in compliance with the relevant Trade Certificates.

4 The Activity of TGM Water Research Institute, p.r.i., in 2016

Research activities of the Institute take place primarily as a part of the main activities of the Institute, with significant contribution of supplementary and other activities as specified in the Founding Deed of the Institute.

The research activity of the Institute encompasses mainly the issues of research of the status, usage and changes of water ecosystems and their relations in landscape and connected environmental hazards, protection of the hydrosphere, flood prevention and waste and packaging management. Other important projects include a research of water quality, aquatic environments, use of water, and development of comprehensive proposals aimed at improvement of water quality and functioning of aquatic ecosystems. The overview of the most important projects is presented in the following description of activities of individual research branches.

Branch of Hydraulics, Hydrology and Hydrogeology is oriented besides basic areas delimited by scientific disciplines in its name on issues of environment protection.

The Department of hydrology dealt with standard hydrology research and issues of climate change impact on water resources and hydrosphere with focus on drought. The most important activity in 2016 was research on drought issues in frame of support to state administration of the Ministry of the Environment. Specifically, the following topics were dealt with: regionalization of the Czech Republic regarding the drought occurrence, countrywide hydrological balance during a drought, shortage volumes and state of protection of surface and groundwater bodies during a drought, the operation drought management plans, comparison of the effect of the construction of new water reservoirs and semi-technical measures for solution of drought impact and water management aspects of water transfers during a drought. Other research project focused on impacts of climate change that were supported by various programs were e.g. research of localities for potential accumulation of surface water and research on adaptive measures in landscape management. The research of water resources in Karlovy Vary Region was focused on assessment of water resources availability for drinking water supply. The basic hydrological research was carried out on calculation of baseflow from influenced flow time series and hydrological data were processed for stations Hlasivo, Bučnice and Pec pod Sněžkou.

Commercial activities were e.g.: processing the data for feasibility studies of water reservoirs Senomaty, Šanov, Čučice, Jozefův Důl and catchment of river Liboc, issues of wastewater discharge in the catchment of Bečva River, validation of flood flows in planned polder Prague-Maniny etc. Regarding the water management planning, the General plan of Water Management of the Czech Republic was dealt with and data were processed for operative management of the Vltava Water Management System during a drought. The hydrological and hydrogeological activities were carried out for Czech Power Works at nuclear power plants Temelín and Dukovany.

The Department of hydraulics successfully finished the research project supported by Technological Agency of the Czech Republic (TA CR): Increasing the Safety and Reliability of Culverts with Regards to the Transfer of Flood Flows. The international project on homogenization of time series continued in cooperation with Federal Hydrological Institute at Koblenz, CHMI and Aqualogic Consulting. The project COST continued and was completed. The project financed by Grant Agency of the Czech Republic continued (Headwaters Retention Potential with Respect to Hydrological Extremes). Regarding the physical hydraulic modeling, the extensive research was completed: Adjustment of the Water Duct below the Navigation

Step Dečín in collaboration with Czech Technical University, Faculty of Civil Engineering. The issues of Navigation Step Děčín were dealt with also by project Physical hydraulic modeling Research of Construction Progress of Water Duct Děčín for the Directorate of Waterways. The new project started: Modeling Research No. 6963 Total Reconstruction and Extension of Central Waste Water Treatment Plant on Císařský Ostrov, stage 0001 new water line – Model for Determination of Hydraulic Parameters in Praha-Troja

In 2016, the Department of hydrogeology carried out four main activities. First was Monitoring of groundwater in surroundings of new nuclear facility at the nuclear power plant Dukovany (completion of boreholes of deep circulation). The department staff participated in project AQUARIUS Assessing Water Quality Improvement Options Concerning Nutrient and Pharmaceutical Contaminants in Rural Watersheds (supported by Norway Grants). In 2016, the project was successfully extended by nationwide socio-economic study on impacts of changes in wastewater treatment. A three-year cross-border Czech-Saxon project RESIBIL financed by EU funds. The aim of the project is to create a joint Czech-German strategy of use of groundwater resources in cross-border areas at climate change conditions. In addition, the department participates in the conceptual and methodological preparation of the 3rd cycle of river basin plans. In 2016, attention was mainly devoted to the application of exceptions for new water management projects and the identification of heavily influenced bodies based on their use and determination of their ecological potential. The hydrogeological study on selected wetlands in Jihlava region was finished, supported by Norway Grants.

Czech Calibration Station for Current Meters (CCSCM) is accredited by the Czech Accreditation Institute as fulfilling the requirements established by CSN EN ISO/IEC 17025:2005 on General requirements for the competence of testing and calibration laboratories. The station is accredited to 17th July 2020. The number (identifier) of the calibration laboratory is the 2278. Scope of the granted accreditation is as follows: calibration of hydrometric propellers (cupped and propeller types) carried out in accordance with ISO 2537:2007 Hydrometry – Rotating-element current-meters and other gauging instruments (electromagnetic and ultrasonic), which can be calibrated in accordance with ISO 3455:2007 Hydrometry – Calibration of current-meters in straight open tanks. Measured variables are the flow velocity derived from the number of pulses of the rotational component of the propeller (with varied increase of k) and flow velocity v derived directly from velocity indicated by gauge. The range of the calibration rate is 0.02–7.00 m/s, the nominal calibration temperature is in the range 1–26 °C. The calibration of hydrometric propellers and other hydrometric devices is a permanent activity included in the statutory activities of the Institute.

Reference Laboratory for the Environment Components and Waste of TGM WRI, p.r.i., is one of the two units of the Test laboratory for components of the environment and water technology of TGM WRI, p.r.i. The Test laboratory received a valid Certificate of good laboratory practice No. 445 issued by ASLAB (Centre for Assessing Proficiency of Laboratories) according to CSN EN ISO / IEC 17025:2005. The Test laboratory received also a Certificate of accreditation issued by Czech Accreditation Institute (CAI): Test laboratory No. 1492 accredited by CAI according to CSN EN ISO / IEC 17025:2005.

Reference Laboratory for the Environment Components and Waste of TGM WRI, p.r.i., consists of four departments, which are able to provide a variety of common and special analyses in various types of matrices.

The Department of hydrochemistry focused on project Criteria and Requirements for the Competence of Persons Authorized to Sample Water supported by TA CR programme Omega. The residues of selected pesticides were determined in hop crops, heads and granules for external client PP servis, a.s. Given that the number of analytes determined has increased significantly in 2016, other methods of determining them have been introduced. The department provided the analyses of samples for the other units of the Institute and also for external costumers. The important activities were the analyses of selected drugs and their

metabolites in surface and municipal wastewater and preparation of samples for proficiency in the basic chemical analysis for the ASLAB (Centre for the assessment of the competence of laboratories). The department participated in preparation of several projects for public calls.

The Department of microbiology focused on two project supported by TA CR OMEGA: project Quality and Assessment of Surface Water and project Conditions for the Successful Transposition and Implementation of the Risk Analysis System for Drinking Water Supply in the Czech Republic (in cooperation with The National Institute of Public Health). The department provided the analyses of samples for the other units of the Institute and also for external costumers. Sample analyses on assimilable organic carbon in waters from different water treatment plants formed a significant part of the activity. The Department prepared samples for proficiency in the microbiology analysis for the ASLAB. The department participated in preparation of several projects for public calls.

The Department of hydrobiology participated in completion of the projects financed by Norway Grants in collaboration with the Branch 280 and the Branch 210: Monitoring of Long-term Changes in Biological Diversity of Running Waters during Climate Change and the project Protection of our Most Vulnerable Biotopes – Wetlands and Steppes. The department provided the analyses of samples for the other units of the Institute and also for external costumers. The Department prepared samples for proficiency in the hydrobiology analysis for the ASLAB.

The Department of radioecology dealt with the studies focused on occurrence and behavior of natural and synthetic radionuclides bellow a source of pollution, at uninfluenced monitoring sites in water samples, samples of sediments, in atmospheric precipitation and water treatment plants. The department performs the activities of the permanent component of the national Radiological Monitoring Network in the normal and emergency radiological situation in cooperation with River Boards, state enterprises (Povodí, s.e.); the activities are based on a contract between Ministry of the Environment and the State Office for Nuclear Safety. The department provided the analyses of samples for the other units of the Institute and also for external costumers. The Department prepared samples for proficiency in the radiology analysis for the ASLAB.

The traditional activity of **Branch of Water Protection and Informatics** is the support of the projects in the Institute regarding informatics. The support is provided by the development and operation of TGM WRI Hydroecological Information System (HEIS VUV). The other branch activity is the management of DIBAVOD including the activities connected to using of geographic information systems. Other activity was annual preparation of Summary water balance assessment of the main river basins of CR according to the Decree of Ministry of Agriculture No. 431/2001 Coll., which provided the results of the analysis of the use of water resources and the water use requirements in terms of quantity and quality in spatial units that are not covered by the water management balances by the River Boards (Povodí), state enterprises.

The branch carried out the support for the state administration (the management of the selected registers ISVS-VODA, preparation of the EC reporting according to Water Framework Directive and support of the reporting in international commissions ICPER, ICPDR and ICPO). The data were collected for Report on Water Management Status in the Czech Republic (the Ministry of the Environment). The Branch participated in the project Procedures for Compilation and Verification of Water Footprint according to International Standards (Ministry of Agriculture, programme KUS), the project Assessing the Impact of Drought on Water Use and ResiBil – The Balance of Water Resources in Eastern Part of Czech-Saxony Border Region and Review of Potential of Their Long-term Use supported by European Fund for Regional Development from Programme Collaboration Czech Republic-Free State of Saxony

2014–2020. The project Flooded cultural and natural heritage of Southern Moravia was completed (Ministry of Culture).

Another activity was the update of water resource protection zones, Bathing Waters Reporting and preparation of cartographic outputs in connection to operation programme environment. The staff of the Branch participated in following projects via data support and development of software for calculation and publishing: Monitoring of NATURA 2000 Sites as a Tool for Effective Management and Conservation of Autochthonous Crayfish, Procedures for Compilation and Verification of Water Footprint according to International Standards, water management balance of current and projected status for catchments of Vltava River and Ohre River, solutions of drought impacts on water use and processing supporting water management studies in connection with preparation of construction of the New Nuclear Facility at Dukovany.

The issues of waste were transferred in the **Branch of Water Technology** with effect from 1st January 2016. The new name of the branch will be the Branch of Water Technology and Waste.

In 2016, the Branch focused mainly on the commercial projects for manufacturers of waste water treatment plants and for state administration. Many smaller projects were carried out and one project of project of foreign development cooperation.

For the support of state administration, three projects were realized. First was focused on processing and verification of data on municipal sources of wastewater pollution, second one was focused on legal analysis on discharge of wastewater from a unified sewer system and third one was focused on impacts of wastewater discharge on surface water quality during a drought.

The collected data will be used to inform the European Union about the status of urban waste water treatment from agglomerations above 2000 PE according to articles 15 and 17 of Directive No. 91/271/EEC on urban waste water treatment.

During the legal analysis, it was founded that forthcoming amendment will not be a part of an amendment to the Water Act, but the issue will be solved via amendments to the decree implementing the Water supply and sewerage Act; the decree belongs to the Ministry of Agriculture. Consequently, the comments were prepared to the draft of the standard CSN 75 6262 (rain separators and relief chambers).

Partial task of the contract Activities to Support the State Administration Regarding the Issues of DROUGHT was focused on assessment of wastewater discharge impacts on surface water quality during a drought.

One of bigger contracts was creation of expert and technical documents for the preparation of three implementing regulations of the new Waste Act for the Waste Department of the Ministry of the Environment. The implementing documents are aimed to fulfill one of the main objectives of the new law: reduction of dumping of waste at landfills and increase of recycling to the level of successful Western EU states. The first implementing regulation concerns setting criteria and conditions specifying that selected types of waste (waste plastic, paper and gypsum) to be ceased to be waste and can be able to be treated as a commodity. The objective of the second regulation was to define the criteria and conditions in such way that fuel produced from a waste can be considered as a commodity (i.e. to lose its status of waste). Last implementing regulation set the criteria specifying when it is possible to consider excavated earth and asphalt slabs from constructions as a byproduct.

Smaller contracts were expert opinions e.g. for the Police of the Czech Republic, the assessment of capacity of wastewater treatment plant for town of Dobřichovice, the assess-

ment of functionality of domestic wastewater treatment plant and the assessment of water effusion on the land and assessment of the impact of supplements in domestic wastewater treatment plants.

At the same time, the staff of the Branch participated in a wide range of research projects, which, however, were not lead by the Branch (especially project financed by the Norway Grants).

Foreign development cooperation project for the Czech Development Agency is focused on some aspects of implementation of the Directive 91/271/EEC on urban wastewater treatment in Moldova. The project aims to assist in the definition of agglomerations and sensitive areas under the Directive in Moldova, and training to increase expertise on the issue of the Directive and the waste water treatment in general. In 2016, the project started by study visit of the staff of the Moldovan Ministry of the environment and the State ecological inspection in the Czech Republic and by data collection in Moldova. The final proposals for the definition of agglomerations and sensitive areas will be processed in 2018.

In 2016, the Testing Laboratory for Water Technology and Environment Components of TGM WRI continued working in similar extent as in previous years. The Laboratory is accredited according to the standard CSN EN ISO/IEC 17025 by Czech Accreditation Institute under number 1492.

Testing Laboratory of Water Equipment (a part of the Testing Laboratory) completed tests of the effectiveness of three small wastewater treatment plants. The testing was carried out according to the procedure laid down in standard CSN EN 12566-3+A2. The test is still running for one small wastewater treatment plant. The testing was initiated for one wastewater treatment plant in non-accredited regime. Other wastewater treatment plant was transported to the Institute to be tested by the procedures reflecting the client requirements.

In 2016, on Course of Sampling for Personnel of Laboratories in Water Management and Technology was organized. All twenty participants have successfully completed the course. Comments were processed on draft legislation of Water Act, Waste Act and Packaging Act and their Implementing Regulations.

In 2016, **Brno Branch** focused on issues of hydrological extremes: floods and drought. Two projects financed by the Ministry of Agriculture (programme KUS) continued for second year. The project New approaches to optimization of integrated protection systems in the context of their economic sustainability brought a variant solution of a system of flood protection and erosion measures in the catchment of the Husí potok stream. The collection of project documentation of selected pilot sites has been completed and their digitalization was initiated within the project System of Water Management Infrastructure Monitoring and Maintenance in cooperation with the firm VARS, a.s. (project leader) and Brno University of Technology (Faculty of Civil Engineering).

Regarding the support of state administration, the data sets were processed and sent to the Ministry of the Environment. The data sets contained information on the procedure of fulfilling the obligations arising from the requirements of EU Directive 2007/60/EC (plans for flood risk management). In connection with the clear tasks resulting from the Directive, calculations were carried out to update the preliminary assessment of flood risks in the Czech Republic. The results were presented to the Working Committee on Implementation.

The final conference was organized for the project Complex planning, monitoring, Information and Educational Tools for Adaptation to the Impacts of Climate Change, with the Main Emphasis on Agriculture and Forestry Management in the Landscape in May 2016.

The attention was paid to drought in second half of 2016. The potential of implementation of seminatural measures for increasing of landscape retention and improvement of ecological status of water bodies was assessed for the Ministry of the Environment.

In 2016, the research project coordinated by Department of Water Quality Protection was initiated (Ministry of Culture, programme NAKI II). The main objective of the project is the comprehensive theoretical and practical elaboration of the quality of the environment of water elements of cultural monuments and historical settlements in the context of heritage care with regard to the assessment of the influence of possible changes of climate. The experts from several institutions participate in the project (National Heritage Institute, The Institute of Vertebrate Biology CAS CR).

Simultaneously, the staff of the branch also ensured the tasks arising from the activities of the committees focused on cooperation in transboundary waters with Slovak Republic and Austria. In the framework of the Czech-Slovak Commission for border waters, activities were carried out in a group for the protection of the waters (the evaluation of the results of monitoring of surface waters on the border watercourses and activities to prevent the exceptional deterioration of water quality. The branch participated in International Commission for the Protection of the Danube River. The activities were focused on requirements for processing the data needed by key expert groups (P&M, MA, Nutrients).

In 2016, the important project was Monitoring of Long-term Changes in Biological Diversity of Running Waters during Climate change Design, Realization, and Implementation in the ARROW Public Information system. The project objective is to extend the current information system of surface water monitoring with a module for monitoring long-term changes in diversity of significant components of the biota of surface running waters (phytobenthos, macrophytes, macrozoobenthos, fish) in conditions of climate change. Partial analyzes of biotype samples were completed and additional sampling was carried out including analyzes, hydromorphological mapping and assessment of monitoring network stations were carried out and data files were analyzed. New data on species composition were compared with data from earlier surveys carried out at the same sites in the 1990s and the last decade.

The objective of interesting project Monitoring of the Effects of the D4 Motorway and Expressway R7 on the Environment– Monitoring of the Biological Elements of the Quality of Surface Waters before the Construction was to obtain the underlying data sets that will be used to monitor the effects of construction and operation of motorway D4 and R7 Expressway in the immediate surroundings of Bratislava. A total of 18 sites were monitored in 2016. Monitoring of water and macrophyte was carried out at these sites; the samples of benthic invertebrates, benthic diatoms, and phytoplankton were taken and processed.

Examples of commercial activities in 2016 are: using the artificial wetlands and extensive water treatment technologies (root wastewater treatment plants, earth filters, stabilization ponds for treatment and final treatment of waste water), the operation of such type of waste water treatment plants and evaluation of impacts of discharged water on water quality in recipients. The clients were local authorities, NGOs, design companies and general public. The hydrochemistry and microbiology laboratories of the Brno Branch provided analyses for the project Monitoring of the Jihlava River in the Surroundings of Nuclear Power Plant Dukovany and for the contract Jungbunzlauer AG (analyses of boundary running waters with Austrian partners).

To sustain the projects of Education for Competitiveness Operational Programme and project ProFor from public call Interreg Czech Republic-Austria from previous years, the collaboration continued with former partners in 2016 (especially Mendel University in Brno).

The expert activity of the **Ostrava Branch** is focused mainly on monitoring and evaluation of the physic-chemical and biological characteristics of processes in hydrosphere to ensure its

protection. The branch activity is also focused on participation in public tenders on water protection, on status and changes of water ecosystems and on other activities. Thanks to that, a wide range of project is carried out according the requirements of contracting authorities (Technological Agency of the Czech Republic, Grant Agency of the Czech Republic, the Ministry of the Interior, the Ministry of Agriculture and Ministry of Education, Youth and Sports).

In 2016, the Branch staff participated in projects that are organized by other units of the Institute and that would be completed in 2017: Quality and Assessment of Surface Water (TACR OMEGA). The cooperation continued on the project Monitoring of NATURA 2000 Sites as a Tool for Effective Management and Conservation of Autochthonous Crayfish. In the long term, the activities are carried out for support of state administration in water management and in waste management according to needs of the founder Ministry of Environment.

As part of the support to the state administration, the employees of the Branch participated in the preparation of documents for the update of the Framework Program of Monitoring, especially given the new requirements and incentives from the European regulations. At the same time, the tasks that emerged from the meetings conclusions of the commissions for cooperation on border waters with Poland were fulfilled. In the frame of the Support to the Participation of the Czech Republic in the Activities of the International Commission for the Protection of the Odra River against Pollution, the attention was paid to the preparation and processing of documents for the group G1 (the Steering Group of the WFD) GM (Monitoring), GP (Planning) and G3 (accidental pollution). In addition, the material was prepared for draft amendments to legislative regulations and implementing methodological guidelines in the field of water management, in particular to the current version of Government Decree No. 401/2015 Coll., On Indicators and Values of Permissible Pollution of Surface Waters and Waste Water, Details of Permit for Discharge of Waste Water into Surface Water and Sewerage Systems and for Sensitive Areas. Independently, the documents were prepared for the draft amendment of the Water Act and its implementing regulation on the protection zones of water resources. As a part of expert support for monitoring and evaluation of surface and groundwater status, the first proposal of methodical procedure for evaluation of long-term trends of concentrations of priority substances in sediments was elaborated. Data were prepared within the complex data base of actual emissions into the aquatic environment in the Czech Republic.

An important part of the professional activities of the employees of the Ostrava Branch was the cooperation on the project of the Compilation and Design of Concept for the Protection from Drought Impacts in the Czech Republic using the implemented measures, which was solved in as a part of the support of state administration in water management for the Ministry of the Environment of the Czech Republic.

Regarding the commercial activities, expert opinions were prepared for construction plans of different construction categories in the framework of the construction of a new transport infrastructure in terms of applying the requirements of article 4.7 of the Water Framework Directive 2000/60/ EC, especially for Directorate of Waterways, the Road and Motorway Directorate and Railway Infrastructure Administration.

In July, the Departments of Hydrochemistry and Hydrobiology obtained the Certificate of accreditation issued by Czech Accreditation Institute (CAI): Test laboratory No. 1702 and the status of Test Laboratory of Hydrochemical and Hydrobiological Analyzes of TGM WRI, branch Ostrava. The scope of the accreditation granted covers the chemical and biological testing of waters, water effluents, sediments, plains, earth, sludge, including surface and waste water sampling. In January, the laboratory departments received an extension of Certificate of good laboratory practice No. 436 issued by ASLAB (Centre for Assessing Proficiency of Laboratories).

Branch of Applied Ecology dealt with several projects supported by TA CR in 2016. Example is the project Software Tools for Evaluating the Hydromorphology of Aquatic Ecosystems and Proposed Measures in Relation to Biological Components. For that, macrozoobenthos and fish communities were sampled. Then, the results of the analyzes in relation to the individual studied habitats were implemented into the developed modeling environment. Another project focused the quality of fish meat from free water, taking into account concentrations of substances threatening human health. The last project focused on development of methodological documents for the protection of the fresh water pearl mussel demands and the provision of suitable conditions for its reproduction and survival in selected localities.

The project focused on water footprint continued in 2016. Pilot studies have been carried out in several business companies for the purpose of elaborating specific water footprint studies. At the same time, the testing and verification was carried out of characterization models for water availability and the possibility of using local data in global models.

Three projects financed from the EES funds continued in 2016 and two of them were completed in 2016. First project was dedicated to monitoring and research on populations of threatened species of crayfish. The activities of the project were focused on the research in the field. Many informative events for professionals and the public were organized. Mutual visits of cooperating experts from Czech Republic and Norway took place. Second project dealt with chemical monitoring and biomonitoring of the river Horní Malše focused on fresh water pearl mussel demands. The project will provide important supporting document for implementation of a part of the Rescue program for *Margaritifera margaritifera* in Czechia. Last project dealt with fragmentation of river network that restricts two-way migration of fish. The project is focused on finding suitable pilot projects for removing migration barriers in territories with priority of nature protection in national and international scale.

In addition to research projects, the Branch also contributed to a number of water-related projects in many aspects. In the framework of the contract for Povodí Vltavy, s.e., an extensive wastewater treatment survey was carried out, including sampling of waste water for the determination of phosphorus forms in nearly 380 municipalities in the catchment of Švihov Reservoir in Želivka River. The evaluated data was processed in the form of geographic layers and detailed technical reports. Within the long-term cooperation with Šumava National Park in 2016, the monitoring of the macrophytes in Teplá Vltava was carried out in order to assess the influence of river riding on macrophytes. Similar project was carried out on Jizera and Ploučnice rivers supported by the Ministry of the Environment. Several smaller projects focused on monitoring sites with the occurrence of protected and endangered species of aquatic organisms from the Natura 2000 network.

Also, contracts focused on the hydraulic and biological monitoring of navigable rivers were dealt with in order to assess the possibilities and constraints of downstream and upstream fish migration.

An important contract was also dealt with at Dukovany, where the water abstraction options for the planned new nuclear power facility were assessed and where its expected effects on the quantity and quality of water in the Jihlava River were assessed.

ASLAB – Centre for Assessing Proficiency of Laboratories is a part of TGM WRI, p.r.i. ASLAB is authorized in accordance with the mandate of Ministry of the Environment to carry out the state delegated powers:

- organization of intralaboratory proficiency testing in the field of environmental laboratory analyses,
- assessment of professional competence of hydro-analytic laboratories in the area of environmental research and protection in accordance with the quality management system CSN EN ISO/IEC 17025 and

- acting as a National Inspection Authority on good laboratory practice in the area of chemical substances and chemical preparations in accordance with the Act No. 350/2011 Coll. and Regulation No. 219/2004 Coll., Code, as amended.

Significant proportion of ASLAB activities falls to proficiency testing (PT) that forms the fundamental level of external supervision over hydro-analytic laboratories. In 2016, 257 laboratories from the Czech Republic and Slovakia participated in testing. ASLAB organized 6 PT projects in chemistry and radiology in 2016. 224 laboratories participated. Three projects in biology were organized and 33 laboratories participated.

ASLAB continues to new and prepared legislation with new testing methods or reference to such methods and creates the methodologies of proficiency testing in these new areas with aim to implement them in programmes of ASLAB. ASLAB prepares the laboratories for the changes that follow from the new or updated legislation and their further verification.

ASLAB granted Certificate on Good Laboratory Practice to 8 newly assessed laboratories in 2016. About 49 such certificates were in force by 31st December 2016. In the area of good laboratory practice, ASLAB checked by 31st December eight testing devices.

ASLAB activities include also cooperation in developing of new regulations of the Ministry of the Environment, technical standards and documents concerning the assessment of laboratories. The objective is the support of the state administration, evaluation of data created by ASLAB activities and to transmit data created elsewhere in the activities of ASLAB. ASLAB produces technical reports on all its activities. The reports are stored in the archive of ASLAB.

Support for the state administration and projects within the competence of the Ministry of Environment were important component of the additional and other activity of the Institute in 2016. Most attention is focused on technical support in the implementation and reporting of selected EU directives and international cooperation in the field of water, on data and expert support to the Ministry of the Environment as a central water office. Many activities focused on drought and controlled artificial infiltration.

International cooperation took place in international commissions for water protection and on transboundary water. Following activities took place:

- support of participation of Czechia in activities of the International Commission for the Protection of the Elbe River (ICPER), support of participation of Czechia in activities of the International Commission for the Protection of the Danube River (ICPDR), support of participation of Czechia in activities of the International Commission for the Protection against Pollution of the Odra River (ICPO),
- expert support of expert groups set up by the European Commission,
- support of participation of Czechia of the Standing Committee for Saxony and the Standing Committee for Bavaria of the Czech-German Commission for Transboundary Waters,
- cooperation on border waters with Slovakia, with Austria and with Poland.

The operation and publishing of data of selected databases of information system ISVS and summary information on water management: this topic is focused on creation of the selected expert supporting documents for needs of the Ministry of Environment. It is necessary to collect and processed these supporting documents with regard to the requirements of section 108 of the Act No. 254/2001 Coll., on the waters, as amended (the Water Act). Those are in particular the documents that are necessary to ensure the role of the Ministry of Environment as a central water office.

Specifically, these are:

- data collection for recording under the responsibility of the Ministry of the Environment pursuant to the relevant section 21 of the Water Act,
- elaboration of documents for aggregate water balance according to section 22 of the Water Act,
- processing of comprehensive information on the waters of the Czech Republic,
- provision of web services for informing the public about the activities in a bilingual version, including the processing of expert texts placed on the web,
- implementation proposal and information support for the system for managing, updating and sharing data from the water resources protection zones,
- processing and updating metadata according to the requirements of the INSPIRE directive,
- management and operation of registers of municipal and industrial pollution sources and water protection projects.

Expert support of the reporting for EU and support of implementation of European legislation in the field of water protection included collection and processing of documents relevant to Czechia due to the implementation of the provisions of the relevant EU directives and their amendments, including a proposal for the transposition into national legislation in 2016. That are mainly the following directives: 2000/60/EC (the Water Framework Directive), 2006/7/EC (bathing water), 2006/44/EC (surface water requiring protection or improvement to support fish life), 2006/11/EC (dangerous substances), 2007/60/EC (floods), 91/271/EEC (urban wastewater treatment), 91/676/EEC (protection of waters against pollution caused by nitrates from agricultural sources), 2008/105/EC (environmental quality standards), 2009/90/EC (technical specifications for chemical analysis and monitoring of water status).

Data and expert support in the area of water protection beyond the previous topics was related to: processing of data and expert documents of application of determination of emission limits, processing of risks of ecological harm assessment, methodological and technical support to the planning process in water management and a system for monitoring and evaluation of water status in Czechia under the relevant provisions of Water Act, creation of expert supporting documents for Ministry of Environment, that are necessary to collect and process with regard to the requirements of the Directive 2007/60/EC on the assessment and management of flood risks in the area of flood damages and the cost of the implementation of relevant measures to minimize the damages and participation of representatives of Czechia in working groups of European Commission for intercalibration of the methods and procedures of evaluation of biological components of ecological status.

In the context of the support of the state administration in drought issues in 2016, the Government of the Czech Republic approved the document Preparation of Measures to Mitigate the Negative Impact of Drought and Water Scarcity in 2015. The document contains a proposal of a set of measures leading to the minimization of drought effects in the Czech Republic (Government Resolution No. 620/2015) and the fulfillment of the tasks of the measures for the period 2015–2018. In this respect, it is necessary to prepare, in particular, proposals for the solution of partial tasks the Department of Water Protection of the Ministry of Environment is responsible for and also to respond to relevant suggestions from other bodies.

The output of 2016 is an expert report covering the following:

- analysis of available data and assessment of current status and level of solution,
- formulation of expert and methodological conclusions (available in connection with the research carried out and projects already dealt with) applicable to the forthcoming

- governmental concept of drought impacts on the territory of the Czech Republic, including the formulation of existing knowledge gaps and uncertainty,
- recommending future steps in the future to provide a comprehensive solution to the issues and to remove the identified ignorance and uncertainty.

Government Resolution 620/2015 also mandates to prepare, by 30th June 2017, a draft concept of protection against drought effects for the territory of the Czech Republic. In 2016, TGM carried out activities leading directly to the fulfillment of this concept.

Regarding the controlled artificial infiltration, the initial phase of the project was carried out in 2016. This initial phase was based on the TGM WRI Study on the Methodology for the Assessment of Artificial Infiltration in the Czech Republic (Hrkal, et al., 2010) funded by the Operational Program Environment. In accordance with the approved methodology, four primary activities were carried out. Subsequently, different technological processes will be implemented based on these primarily activities.

The following activities were carried out at each of six pilot localities (Meziboří, Holedeč, Kluk, Majdaléna, Kroměříž and Lednice):

- detailed administrative research to find suitable cadastral zones, the permission of the landowner with subsequent technical activities will be secured and conflict of interest (existence of networks) will be excluded, the output of this phase is administrative readiness of given land for a subsequent set of technical activities;
- the establishment of special climate monitoring and the concepts of climatic scenarios for each locality;
- the base of hydrological balance model was built for each locality, based on archive data (long-term precipitation, temperature and flow time series) and field measurements (hydrometry, thermometry);
- the detailed geophysical survey was carried out at each locality. The objective was to get maximum information on geometry and properties (thickness and grain size) of Quaternary sediments. These data will serve as a base for proposal of drilling and other technical activities.

In the context of its activities the T. G. Masaryk Water Research Institute, p.r.i., also participates in public tenders and seeks opportunities to apply the expertise of its divisions. TGM WRI participated in the public competitions from eight providers with a total of 39 of the proposed projects in the framework of the announced tenders and programmes realized according to Act No. 130/2002 Coll. The Institute succeeded with 12 projects (30.7% success).

In 2016, 109 business opportunities were found on the Internet. The opportunities were proposals of commercial contracts based on different calls and public procurements. About 25 proposals have been prepared after consultation and 9 contracts have been obtained. Other possibilities of obtaining the projects from direct offer, besides these found by specialized department were discussed by research managers.

4.1 Main activities

4.1.1 Publications in journals

In 2016, the employees of the Institute were authors or coauthors of 44 contributions in scientific journals. The absolute majority of the other contributions were published in peer reviewed journals. Three contributions were published in journals with IF (Soil and Water Research, Climate Research, Environmental Science and Pollution Research).

4.1.2 Monographs

TGM Water Research Institute published in 2016 monographs: Ansorge, L., et al.: Projekt QJ1520322 Postupy sestavení a ověření stopy v souladu s mezinárodními standardy (Procedures for Compilation and Verification of Water Footprint according to International Standards), Hanslík, E., et al.: Behavior of selected radiological, biological and physic-chemical indicators of the hydrosphere and their changes related to the operation of the Nuclear Power Plant Temelín, Mlejnková, H., et al.: Zatopené kulturní a přírodní dědictví jižní Moravy (Flooded cultural and natural heritage of Southern Moravia, Catalogue of the exhibition), and Mlejnková, H., et al.: Zatopení kulturní a přírodní dědictví jižní Moravy (Flooded cultural and natural heritage of Southern Moravia).

4.1.3 Results with legal protection and technically implemented results

In 2016, many technically implemented research results have been created in the Institute. A patent was awarded e.g. to Passive Time Integrated Sampler Water and suspended solids. This invention is related to representative sampling of water and suspended solids (or substances bounded to them) from small and medium watercourses during increased flow.

Furthermore, 14 utility models were registered: drum washing machine for filter materials was created in the research optimization and increased efficiency of wastewater treatment; semi-continual enclosed aerobic bioreactor for cultivation of selected bacterial-enzymatic preparations with aim to support the processes of wastewater treatment was created in same research; pulse regulating drain allows to empty the root filters in the predetermined pulses: the advantage is a more compact shape and there is no need to use hanging boards, etc.; compact device for the pre-treatment of the waste water – solution increases the separation of suspended solids, and also intensifies the reduction of organic pollution by aerobic bacteria; floating mixing and aeration device – this island is designed to improve conditions for purification processes in biological tanks, i.e. limitations of the zonation of the water and the layering of the water temperature, aeration of the water, etc.; culvert of square shape with vertical inlet is an example of construction solution of culverts bellow transport communications; semi-natural riverbank bar and semi-natural impermeable riverbank bar are designed for protection of riverbanks and shaping of a channel at semi-natural and revitalization of riverbanks; seminatural semi-permeable splitter of river flow is also designed for channel shaping; culvert of circular shape with vertical inlet is an example of construction solution of culverts bellow transport communications and one of important factors for transformation of flood flow; four utility models were created in project on increasing the safety and reliability of culverts with regard to transformation of flood flows: the protective device of a culvert in a channel without permanent flow, the protective device of a culvert in a channel with permanent weak flow, the protective device of a culvert in a channel with permanent strong flow, the protective device of a culvert in a potentially inundated zone.

4.1.4 International cooperation in research

Examples of international projects are: IHA UNESCO: FRIEND (Flow Regime from International and Network Data), AQUARIUS – Assessing Water Quality Improvement Options Concerning Nutrient and Pharmaceutical Contaminants in Rural Watersheds (Norway Grants), Protection of our Most Vulnerable Biotopes – Wetlands and Steppes (Norway Grants). Important example of international cooperation is foreign development cooperation project Harmonization of Legislation with Directive 91/271/EEC on Urban Wastewater Treatment in Moldova.

Other examples of international cooperation are Monitoring of NATURA 2000 Sites as a Tool for Effective Management and Conservation of Autochthonous Crayfish and collaboration with University Koblenz-Landau concerning the fauna in groundwater.

Collaboration Federal Institute of Hydrology in Koblenz is focused on homogenization of time series for selected gauges on the Elbe River.

4.1.5 Presentation at international meetings of experts

The employees of the Institute participated in international experience exchange. They participated in organization of international workshop Proceedings of the workshop Assessment the Safety of Uranium Mining and Milling Facilities (Shijiazhuang, China).

They participated in 9 international conferences and had 26 oral presentations, conference proceedings or posters. The most important conferences were e.g. 43rd IAH Congress (Montpelier, France), 2nd EWAS International Conference: Efficient & Sustainable Water Systems Management toward Worth Living Development (Chania, Greece), 5th International Conference and Exhibition on Occupational Health & Safety (Dallas, USA), 2nd Central European Symposium for Aquatic Macroinvertebrate Research (CESAMIR) (Pécs, Hungary), 11th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES) (Lisabon, Portugal) etc.

4.1.6 Important national meetings of experts

In 2016 employees of TGM WRI, p.r.i., organized or participated in preparation of more than 30 conferences, seminars and workshops.

Examples are: National dialogue on Water, expert seminar with the company GEOTest, a.s., for potential users of the results of the project Ensuring the Quality of Drinking Water Supplied to Small Municipalities from Local Sources, conference Radionuclides and Ionizing Radiation in Water Management, XXII. consultation days for water radiological laboratory workers, expert seminar for employees of River Boards Povodí, s.e., to preparation of the updated norm ČSN 75 7221 Water quality – Surface water classification, organization of exhibition Flooded cultural and natural heritage of Southern Moravia, seminar on clearing of migration obstacles in watercourses, the course Sampling for Water Management and Inspection Laboratories, lectures on crayfish occurrence and protection etc.

4.2 Additional and Other Activity

4.2.1 Methods and results reflected in standards and legislation

The Institute employees were also significantly involved in the preparation of guidelines, legislation and standardization in 2016.

Regarding legal directives and methodological documents the Institute staff prepared documents for Government Decree No. 235/2016 Coll., Amending Government Decree No. 262/2012 Coll., on the definition of vulnerable areas and the action program, as amended. Study on effectiveness of delimitation of mixing zones according to section 6 of Decree No. 98/2011 Coll. in the conditions of the Czech Republic contains an update of the extent of the localities, where it would be useful to define the mixing zones on the basis of the results of the chemical status evaluation of the surface water bodies within the 2nd river basin plans. Within the framework of the task of expert support for legislation in water management, the Environmental Quality Standards for selected specific pollutants were prepared: benzo(a)anthracene, bisphenol A, phenanthrene, glyphosate, aminomethylphosphonic acid, ethylenediaminetetraacetic acid, 2-[Bis(Carboxymethyl) amino]acetic acid, metazac.

The Report of the Czech Republic on the state and directions of development of the aquatic environment and agricultural practices was prepared. The Report is prepared according to article 10 and annex V of Council Directive 91/676/EEC on the protection of waters against pollution caused by nitrates from agricultural sources.

The Institute prepared also four methodologies, e.g. Methodology for the determination of minimum residual flow values as a basis for government regulation, Methodology for designing inundation areas etc.

The staff of the Institute participated in the preparation of the standard CSN 757613 Water Quality – Determination of total volume activity Alpha using the fast method.

They evaluated in total 17 standards in the frame of cooperation with technical standards committee 104. Reports were prepared on the assessment of the project in relation to article 4(7) of Directive 200/60/EC of the European Parliament and of the Council of 23rd October 2000 establishing a framework for Community action in the field of water policy for state organizations in the sector Ministry of Transport.

4.2.2 Consulting and expert activity including support for the state administration

Consulting and expert activity is an important form of the direct application of research results. In 2016, the expert opinions were prepared e.g. for: The Ministry of Transport, the Directorate of Waterways, the Railway Infrastructure Administration, the Road and Motorway Directorate or the Police of the Czech Republic.

Consulting services were permanently provided in various areas for local authorities, non-governmental organizations, and specialized laboratories and also for the public. Example of such activity is the consulting in the area of using of artificial wetlands and extensive technologies of the water treatment etc.

Regarding the support of state administration the activity of the interdepartmental commission Water-drought was carried out. The documents for the Concept of Drought Protection in the Czech Republic were elaborated. The position of the Coordinator of the National Report of the Czech Republic for the Convention on Nuclear Safety SONS was ensured and comments on the National Report of the Czech Republic for the purposes of the Nuclear Safety Convention 2016 were prepared.

The other tasks in frame of support of the state administration were especially for the Ministry of the Environment: the operation and publishing of data of selected databases of information system ISVS-VODA.

The employees of the Institute were involved in reporting for the EU, the European Environmental Agency, and also in preparation of statements and orders for the need of state administration and local authorities etc.

The employees of the Institute were significantly active in international commissions – International Commission for the Protection against Pollution of the Odra River and International Commission for the Protection of the Elbe River etc. The employees of the Institute are involved in many expert groups within these commissions and also in preparation of the documents for their meetings. The employees of the Institute are also involved in the final assessment of the projects and their proposals (e.g. for TA CR).

4.2.3 Other activities

An important part of the activity of the Institute includes also collaboration with universities. The staff of the Institute presented a series of lectures at e.g. Faculty of Environmental Sciences of Czech University of Life Sciences, Faculty of Natural Sciences of Charles University, Faculty of Natural Sciences of Masaryk University, VSB-Technical University of Ostrava, Faculty of Natural Sciences of Ostrava University and at Brno University of technology. The employees of the Institute provide consultations and are supervisors of dissertation and diploma theses (Faculty of Natural Sciences of Charles University, Czech University of Life Sciences, Czech Technical University etc.). Students can participate in excursions organized by the staff of the institute and they can participate in practical training in the Institute. The employees of the Institute also act as members of the state examination commissions at Charles University, Czech University of Life Sciences and Czech Technical University.

The staff is also active in national and international professional organizations and scientific associations – Czech National Committee for Hydrology, Czech Meteorological Society, Czech Hydrogeologist's Association, the interdepartmental expert Commission WATER-DROUGHT International Association of Hydrogeologists IAH, nitrate committee EC etc.

4.3 Economic Issues

The completion of the project Strategy was only one fundamental change in 2016. The positive fact is that, despite the initial difficulties, thanks to the achievement of projects during the year Institute managed to maintain a balanced budget with a modest economic result. Cost-saving measures were in force throughout the year (especially in the area of purchases and services) and this had a positive effect on the economy. Some negative phenomena still persist, especially the ex-post reimbursement of projects, thanks to the lengthy assessment and verification of project bills, delaying payment for almost a year. However, cash flow of the Institute is disturbed and the only way to deal with the situation is to use the loan, which, however, carries additional interest costs. Another problem is unequal conditions in international projects where the conditions of a foreign partner are considerably better than ours.

A very positive can be considered the cooperation with the founder. It is evident not only from support of the state administration but also from overall approach and interest in cooperation. However, this can not be said for some other providers. High level of co-financing, disproportionately low eligible overheads, some cars operating costs: this is a minor list of the problems the Institute faces and that complicates its life. Due to these constraints, we are unable to get into the programs that are close to us, and we have to look for projects that make it possible to maintain a balanced economy. Because we are a nonprofit organization whose main focus is on research activity and our other (commercial) activity should have only secondarily priority. The other activity should provide the funds to support; consequently this method of management is not at all easy.

The impact of VAT payback has a recurring negative effect on the economy of the Institute.

The budget of CZK 170 435 thousand for 2016, was created balanced in accordance with Act No. 341/2005 Coll. on public research institutions. Total revenues amounted in 2016 to CZK 150 654 292.47 and costs reached CZK 148 335 582.99. Consequently, the total out-

come of the Institute's activities was represented by the end-of-year result of CZK 2 318 709.48 in surplus. The proposal to transfer the whole positive outcome in 2016 in reserve fund was submitted to the relevant bodies of the Institute.

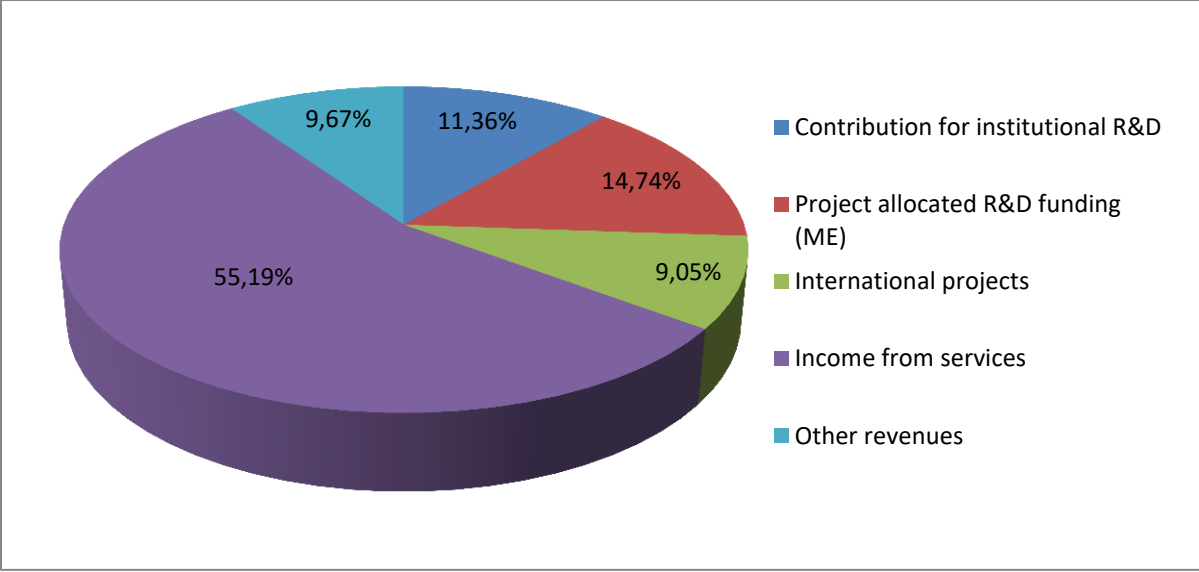


Fig. 1. Revenue structure

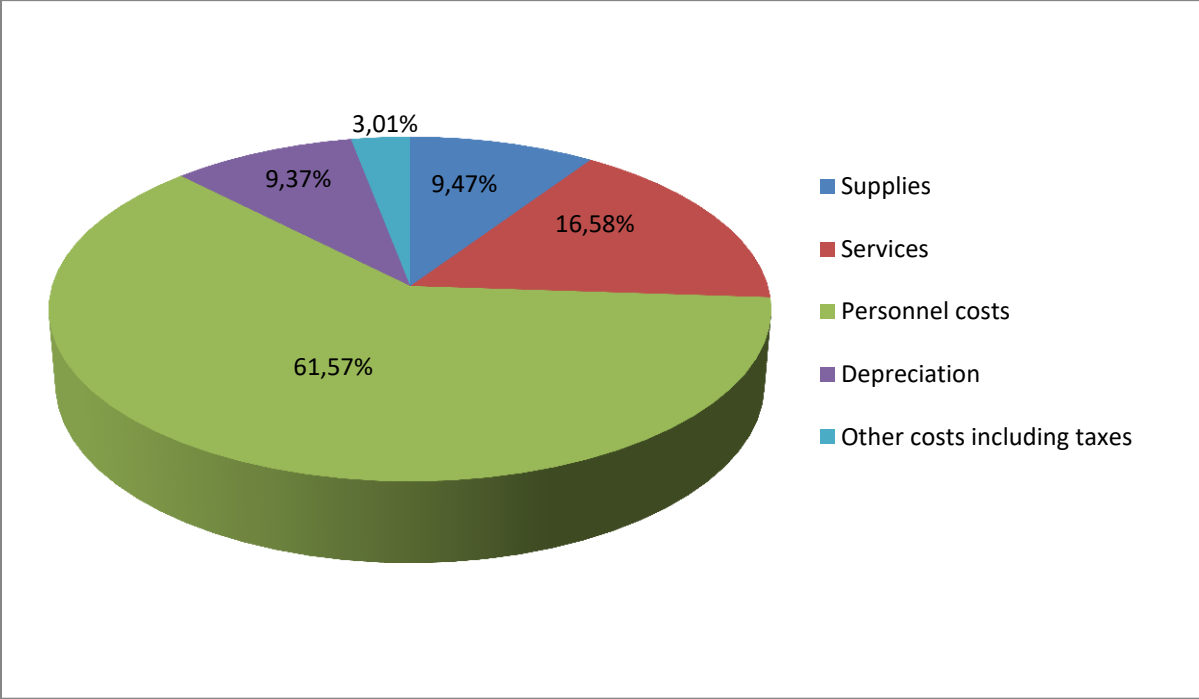


Fig. 2. Cost structure

5 Other Requested Information

5.1 Information on measures for elimination of imperfections of management and their fulfilment

No measures to elimination of imperfections of management were assigned.

5.2 Information on things that come to pass after the balance sheet day and are important for fulfillment of the purpose of the institution

No things important for fulfillment of the purpose of the institution come to pass after the balance sheet day.

5.3 Activities in a field of environmental protection

Regarding the fact that the type of activity of the Institute is closely connected with topical environmental issues, its operation is focused primarily on this sector: mainly on research of aquatic ecosystems and their relations in landscape and connected environmental hazards and on issues of waste and packaging management.

The Institute lays stress primarily on care of the environment and permanently sustainable development. This care includes the effort of energy saving. The waste is separated to full extent, vegetation is cared about and other relevant activities take place.

5.4 Activities in employment relationships

In 2016, there were no major organizational changes. Only the Branch of Water Technology has changed the department's name to the Branch of Water and Waste Technology and the Waste Management Center has been associated with the Branch.

The number of 192.5 employees worked in TGM WRI, p.r.i., in 2016 (31st December 2016). The research and expert employees constituted 84% (110.1 research workers and 51.54 expert workers) and operational employees constituted 16% of total employees' number.

Table 1. Employees structure according to age and sex – physical state by 31st December 2016

Age	Men	Women	Total	%
21–30 years	10	16	26	11.77
31–40 years	30	27	57	25.79
41–50 years	31	30	61	27.60
51–60 years	14	30	44	19.91
61 years and more	21	12	33	14.93
Total	106	115	221	100

The average age is 46.07 years, the men average age is 46.72 and women average age is 45.46 years.

Table 2. Employees structure according to achieved education and sex – physical state by 31st December 2016

Education level	Men	Women	Total	%
Basic school	0	3	3	1.36
Apprenticeship	4	2	6	2.71
Secondary technical	0	1	1	0.45
Completed secondary general	0	2	2	0.91
Completed secondary technical	20	37	57	25.79
Bachelor	1	2	3	1.36
Master	57	54	111	50.23
Doctoral	24	14	38	17.19
Total	106	115	221	100

Table 3. Employees structure according to a length of employment and sex – physical state by 31st December 2016

Duration	Men	Women	Total	%
up to 5 years	28	28	56	25.34
6–10 years	17	21	38	17.20
11–15 years	22	23	45	20.36
16–20 years	23	18	41	18.55
over 20 years	16	25	41	18.55
Total	106	115	221	100

5.5 Organizational units abroad

T. G. Masaryk Water research Institute, p.r.i., has no organizational units abroad. It is delegate of CR in organization Global Water Partnership – Central and Eastern Europe since 2009.

5.6 Supposed development of the organization in 2017

It can be expected that also the 2017 year will be economically very challenging mainly from point of view of winning contracts of all kinds. TGM WRI, p.r.i., will naturally focus its activity on tasks following from its fundamental mission i.e. mainly on:

- research of aquatic ecosystems and their relations in landscape and connected environmental hazards and on issues of waste and packaging management,
- expert support for the state administration in the field of hydrosphere and waste and packaging management, based on performed research.

The activity of the Institute is focused not only on continuing research projects, grants, commercial projects, but mainly on winning of other projects in the frame of all relevant calls and competitions. The attention is focused of projects financed from resources of EU and also national funders supporting the research and development in sector of water and waste. It's necessary to focus with exceptional intensity on commercial contracts: the only source of financial funds for already absolutely generally requested co-financing in grants.

6 List of Projects in 2016

Title	Project manager	Client
Branch of Hydraulics, Hydrology and Hydrogeology		
Compensation of negative climate change impacts on water supply and ecosystems using the localities for potential accumulation of surface water	Ing. R. Kožín	Technology Agency of the CR ALFA
Uncertainties in Water Footprint and new way of work with the predictions of climate models	Ing. Š. Blažková, DrSc.	Ministry of Education, Youth and Sports
Revision of Vulnerable Zones for Nitrate Directive	Ing. A. Hrabánková	Ministry of the Environment
Increasing the safety and reliability of culverts with regards to the transfer of flood flows	Ing. P. Balvín	Technology Agency of the CR ALFA
Support of Activities in the Process of the River Basin Management Planning	RNDr. H. Prchalová	Ministry of the Environment
Processing of methodologies concerning the minimum residual flows	Ing. P. Balvín	Ministry of the Environment
Activities to Support the State Administration Regarding the Issues of DROUGHT	RNDr. J. V. Datel, Ph.D.	Ministry of the Environment
Controlled Artificial Infiltration	doc. RNDr. Z. Hrkal, CSc.	Ministry of the Environment
Hydrological Balance of Water Quantity during a Drought Period in the Czech Republic	Ing. A. Vizina, Ph.D.	Ministry of the Environment
An Analysis of Shortage Volumes in Surface and Groundwater Bodies	doc. Ing. M. Hanel, Ph.D.	Ministry of the Environment
Drought Impacts on Water Quality, Analysis of Current situation and Its Causes	RNDr. J. V. Datel, Ph.D.	Ministry of the Environment
The Methodology of Processing of Operation Plans for Drought Control	Ing. R. Vlnas	Ministry of the Environment

Comparison of the Effects and Impacts of the Construction of New Water Reservoirs and the Spectrum of Semi-technical Measures	Ing. R. Kožín	Ministry of the Environment
Hydrological and Water Management Aspects of Water Transfers and of Interference with the Hydrographic Network during Drought	Ing. M. Nesládková	Ministry of the Environment
Evaluation of the Analyses and Elaboration of the Concept of Protection against the Effects of Drought for the territory of the Czech Republic Using Implemented Measures	RNDr. T. Hrdinka, Ph.D.	Ministry of the Environment
Increasing water resources availability in selected regions of Karlovy Vary district	Ing. A. Beran	Ministry of Agriculture, programme KUS
Verification of Hypothesizes on Outflow Formation by Model MIPs	Ing. Š. Blažková, DrSc.	Charles University – Grant Agency of the CR
Goal 3 – Transboundary Collaboration Saxony-RESIBIL	doc. RNDr. Z. Hrkal, CSc.	CRD
Assessing water quality improvement options concerning nutrient and pharmaceutical contaminants in rural watersheds	doc. RNDr. Z. Hrkal, CSc.	Norway Grants - Ministry of Education, Youth and Sports - CULS
Protection of our Most Vulnerable Biotopes – Wetlands and Steppes	Mgr. P. Eckhardt	Norway Grants – Ministry of the Environment – Czech Union for Nature Conservation

The Influence of Water Reservoirs on Flood 2013	Ing. P. Balvín	BFG Koblenz
Calibration of Current Meters	Ing. A. Trávníčková	Joint Contract
Hydrological and hydrogeological survey in vicinity of the new nuclear facility of Dukovany Nuclear Power Plant, DP 9	doc. RNDr. Z. Hrkal, CSc.	Nuclear Research Institute Řež
China – Safety of Wasteponds for the Extraction and Treatment of Uranium	RNDr. J. V. Datel, Ph.D.	Nuclear Research Institute Řež
Support at Fulfillment of Conditions to Placement for the New Nuclear Facility at Nuclear Power Plant Temelín	RNDr. J. V. Datel, Ph.D.	Energoprůzkum
Collaboration on a Physical Modeling Research of the Adjustment of the Water Duct bellow the Navigation Step Děčín	Ing. P. Balvín	CTU, faculty of civil engeneering
Analysis of Potential Impacts of the Project of Water Duct Děčín on German Territory	Ing. P. Balvín	Directorate of Waterways
Physical Hydraulic Modeling Research of Construction Progress of a Water Structure	Ing. P. Balvín	Directorate of Waterways
Water Work Hněvkovice – the Validation of Consumption Curves on Physical Model	Ing. Z. Bagal	Povodí Vltavy, s. e.
Total Reconstruction and Extension of Central Waste Water Treatment Plant on Císařský Ostrov	Ing. P. Balvín	The City of Prague
Increasing Capacity of Water Reservoir Rozkoš by Transfer from Metuje River – hydrological characteristic	Ing. L. Kašpárek, CSc.	Povodí Vltavy, s. e.
Supplement of the Monitoring Network of Deep Circulation Groundwater in Surroundings of New Nuclear Facility of Nuclear Power Plant Dukovany with One Monitoring Hydrogeological Borehole (maximum depth 250 m)	doc. RNDr. Z. Hrkal, CSc.	Nuclear Research Institute Řež
Water Work Hněvkovice – the Validation of Consumption Curves on Physical Model	Ing. Z. Bagal	Povodí Vltavy, s. e.
II. Phase of the General Plan of Water Management of the Landscape of the Czech Republic	Ing. A. Vizina, Ph.D.	Mendel Univerzity, Brno

The Assessment of Minimum Total Outflows and Baseflows Regarding Water Use and Other Factors	Ing. R. Vlnas	Povodí Vltavy, s. e.
Water Work Šanov- Feasibility Study	Ing. R. Kožín	SWECO Hydroprojekt
Water Work Senomaty – Feasibility Study	Ing. R. Kožín	SWECO Hydroprojekt
Expert Opinion on Action "Remedial Measures – Ostramo Lagoons"	Mgr. P. Eckhardt	DIAMO, s. e.
Hydraulic Model of Water Work Bílá Desná	Ing. Z. Bagal	Povodí Vltavy, s. e.
Reducing the Grade Level Karlín: Validation of Transformation Effects of Flood Flows in Planned Polder Maniny	RNDr. T. Hrdinka, Ph.D.	The City of Prague
The Vltava Water Management System – Data for Medium-term Planning of Operation under Low Flow Conditions	Ing. M. Nesládková	Povodí Vltavy, s. e.
Hydrological Modeling and Calculation of the Available Water Resources in the Intercatchments Based on the Hydrological Balance, Water Use Database and Water Management Infrastructure	Ing. A. Vizina, Ph.D.	CzechGlobe
Reference Laboratory of Environment Components and Wastes		
Conditions for the Successful Transposition and Implementation of the Risk Analysis System for Drinking Water Supply in the Czech Republic	RNDr. D. Baudišová, Ph.D.	Technology Agency of the CR OMEGA
Quality and Assessment of Surface Water	RNDr. D. Baudišová, Ph.D.	Technology Agency of the CR OMEGA
Criteria and Requirements for the Competence of Persons Authorized to Sample Water	Ing. A. Petránová	Technology Agency of the CR OMEGA
Radiation Monitoring Network Water Contamination Monitoring Sites	Ing. E. Hanslík, CSc.	Ministry of the Environment
Support to activities of the permanent and emergency component of nationwide Radiation Monitoring Network	Ing. E. Hanslík, CSc.	SONS
Monitoring and Assessment of Quality of Groundwater and Its Changes at NPP Temelín	Ing. E. Hanslík, CSc.	Czech Power Works
Determination of pesticides in crops hop	Ing. V. Očenášková	PP servis

Determination of tritium in surface water influenced by waste water discharged from Temelín Nuclear Power Plant	Ing. B. Sedlářová	Povodí Vltavy, s. e.
The Determination of Waste Water Discharge Limits from NPP Temelín	Ing. E. Hanslík, CSc.	Czech Power Works
The Monitoring of Total Atmospheric Deposition	Ing. A. Petránová	The Krkonoše Mountains National Park
The Content of Radioactive Substances in the Orlík Reservoir	Ing. E. Hanslík, CSc.	Povodí Vltavy, s. e.
Site remediation (removal of contamination)– Nuclear Research Institute Řež	M. Novák	Nuclear Research Institute Řež
Branch of Water Protection and Informatics		
Development of Methodological, Planning and Monitoring Measures for Solving of the Fragmentation of the River Continuity in the Czech Republic	Mgr. A. Zbořil	VRV – Technology Agency of the CR ALFA
The Development of a Methodology for Evaluation of State Certified Infrastructure for Spatial Information in the Czech Republic	RNDr. E. Sovjáčková	Technology Agency of the CR BETA
Bathing waters reporting: update of the List of identified bathing waters	Ing. T. Fojtík	Ministry of the Environment
The support of the representation of the Czech Republic in activities of the International Commission for the Protection of the Elbe River (ICPER)	Ing. M. Kalinová	Ministry of the Environment
The support of the participation of the Czech Republic in activities of the Czech-German Commission for Cross-Border Water	Ing. M. Kalinová	Ministry of the Environment
Updating of water resource protection zones	Ing. H. Nováková, Ph.D.	Ministry of the Environment
Report on Water Management in the Czech Republic – Comprehensive Preparation of Documents in the Field by the Ministry of Environment	Mgr. H. Černá	Ministry of the Environment
Water Balance, Audit and Evaluation in the Field of Water Quantity and Quality	Ing. J. Dlabal	Ministry of the Environment
Reporting of emissions into the aquatic environment	Ing. P. Vyskoč	Ministry of the Environment
Data Support to State Administration in Water Management and Preparation of Cartographic Outputs	Ing. T. Fojtík	Ministry of the Environment

Creation of the Report for the European Commission on Changes in General and Water Management Characteristics of Basins	Ing. P. Vyskoč	Ministry of the Environment
Assessing the Impact of Drought on Water Use	Ing. P. Vyskoč	Ministry of the Environment
Water Management Balance of Surface Water Quantity in Subbasins Upper Vltava, Berounka and Lower Vltava	Ing. P. Vyskoč	Ministry of the Environment
The data support of the state administration in the field of water management and cartographic outputs	Mgr. A. Zbořil	Ministry of the Environment
Branch of Water Technology		
Preparation of Supporting Documents for the Decree according to Delegation by the Forthcoming Amendment to the Water Act for Construction and Operating Conditions of Relief Chambers on a Unified Sewer System	Ing. M. Váňa	Ministry of the Environment
Reporting according to Articles 15 and 17 of Council Directive no. 91/271 / EEC in 2016	Ing. J. Čapková	Ministry of the Environment
The Processing of Expert and Technical documents for the Preparation of Implementing Regulations of the new Waste Act	Ing. D. Vološínová	Ministry of the Environment
Harmonization of Legislation with the EU Directive for Waste Water Management	Ing. J. Kučera	Czech Development Agency
Activity of the Testing laboratory for water management facilities	Ing. J. Čapková	Joint contract
The Development of a Methodology for Testing of Activated Carbon on the Želivka Water Treatment Plant for the Purposes of the Selection of Type of Activated Carbon on Sorption Filters for Ionization in the Production of Drinking Water	Ing. M. Váňa	Želivka Water Treatment Plant
Expert Opinion on Waste Water	Ing. J. Kučera	Czech Power Works
Sampling courses	RNDr. J. Fuksa, CSc.	Joint contract
Brno Branch of the Institute		
Flooded cultural and natural heritage of Southern Moravia	RNDr. H. Mlejnková, Ph.D.	Ministry of Culture
Non-invasive and Environmentally Friendly Approaches to Environmental Quality and Maintenance of Water Elements in the Context of Heritage Care	Ing. M. Rozkošný, Ph.D.	Ministry of Culture
The expert support for the evaluation and mitigation of flood risks	Ing. K. Drbal, Ph.D.	Ministry of the Environment

Expert support of the Czech Republic's participation in the International Commission for the Danube River Protection	Ing. S. Juráň	Ministry of the Environment
Cooperation with Austria on transboundary waters	RNDr. H. Mlejnková, Ph.D.	Ministry of the Environment
Cooperation with the Slovak Republic on transboundary waters	Ing. S. Juráň	Ministry of the Environment
Intercalibration for Assessment of Biological Components	RNDr. D. Němejcová	Ministry of the Environment
Reporting on Plans for Flood Risk Management	Mgr. P. Štěpánková, Ph.D.	Ministry of the Environment
Support for the Revision of the Procedures of Evaluation of Material Flood Damage in the Czech Republic	Mgr. P. Štěpánková, Ph.D.	Ministry of the Environment
An analysis of Past Experience of the Dry Season	Ing. M. Forejtníková	Ministry of the Environment
Potential of Application of Nature-friendly Measures for Water Retention in the Landscape and Improvement of Ecological Status of Water Bodies	Ing. M. Dzuráková	Ministry of the Environment
New approaches to optimization of integrated protection systems in the context of their economic sustainability	Ing. K. Drbal, Ph.D.	Ministry of Agriculture, programme KUS
System of Water Management Infrastructure Monitoring and Maintenance	Mgr. P. Štěpánková, Ph.D.	Ministry of Agriculture, programme KUS
Monitoring of long-term changes in biological diversity of running waters during climate change	RNDr. D. Němejcová	Norway Grants – Ministry of the Environment
Complex planning, monitoring, information and educational tools for adaptation to the impacts of climate change, with the main emphasis on agriculture and forestry management in the landscape	Ing. K. Drbal, Ph.D.	Norway Grants – Ministry of the Environment – VUT
Monitoring of the Effects of the D4 Motorway and Expressway R7 on the Environment – Monitoring of the Biological Elements of the Quality of Surface Waters before the Construction	Mgr. M. Straka, Ph.D.	HBH Projekt, s. r. o.
Data processing for Innovation voucher JIC	Ing. M. Rozkošný, Ph.D.	GEOSAN, spol. s r. o.

Proposal of Integrated System of Flood Prevention and Drought Prevention on the Territory of the Micro-region Žulovsko	Ing. J. Uhrová, Ph.D.	Silezika, z. s.
Monitoring of the Impact of the Dukovany Nuclear Power Plant on the Quality of Water in the Jihlava River	RNDr. H. Mlejnková, Ph.D.	Czech Power Works
Ostrava Branch of the Institute		
Expert Support to Legislative Regulations within the Water Management	Ing. P. Tušil, Ph.D., MBA	Ministry of the Environment
Expert Support to Monitoring and Evaluation of Groundwater State	Ing. P. Tušil, Ph.D., MBA	Ministry of the Environment
Support to the Participation of the Czech Republic in the Activities of the International Commission for the Protection of the Odra River against Pollution	Ing. L. Trdlica	Ministry of the Environment
A Comprehensive Data Base of Actual Emissions into the Aquatic Environment in the Czech Republic	Ing. A. Kristová	Ministry of the Environment
Cooperation in Transboundary Waters with Poland	Ing. L. Trdlica	Ministry of the Environment
Evaluation of the Impacts of Drought in Bodies of Surface Water to Water and Water-bound Organisms	Ing. P. Tušil, Ph.D., MBA	Ministry of the Environment
Assessment of Constructions in Relation to Directive 2000/60/EC	Ing. P. Tušil, Ph.D., MBA	SŽDC
Fire Retardant in Manufacturing and Internal Environment in the Czech Republic (subcontract)	Ing. T. Mičaník, Ph.D.	EH Services, a. s.
Assessment of the Project Plans in relation to the article. 4 (4.7) European Parliament and Council Directive 2000/60/EC	Ing. P. Tušil, Ph.D., MBA	SŽDC
The Assessment of the Project Plan for Road I/11 Nebory-Oldřichovice-Bystřice	Ing. R. Kořínek, Ph.D.	ŘSD
The Assessment of the Construction of D35 Opatovice-Ostrov	Ing. T. Sezima, Ph.D.	ŘSD
Branch of Applied Ecology		
Fish Meat Security in Freshwaters and Aquaculture of the Czech Republic: Do we Know What We are Eating?	Ing. J. Musil, Ph.D.	Technology Agency of the CR OMEGA
The Methodology to Support Fresh Water Pearl Mussel	Mgr. K. Tichá, Ph.D.	Technology Agency of the CR BETA

Monitoring of Water in Selected Localities of Natura 2000 Network	Ing. V. Kladivová	Ministry of the Environment
Software Tools for Evaluating the Hydromorphology of Aquatic Ecosystems and Proposed Measures in Relation to Biological Components	Mgr. P. Kožený	Šindlar – Technology Agency of the CR ALFA
Assessment of Influence of Riding the Rivers Jizera and Ploučnice	RNDr. Z. Hořická, Ph.D.	Ministry of the Environment
Update of the Methodologies of Sampling Fish Populations and Evaluation of Ecological Status — Biological Component Fish for Major Rivers	Ing. J. Musil, Ph.D.	Ministry of the Environment
Procedures for Compilation and Verification of Water Footprint according to International Standards	Ing. L. Ansorge, Ph.D.	Ministry of Agriculture, programme KUS
Preparation of a Strategy to Mitigate the Effects of Fragmentation of River Networks in the Czech Republic	Ing. J. Musil, Ph.D.	Norway Grants – Ministry of the Environment
Monitoring of NATURA 2000 Sites as a Tool for Effective Management and Conservation of Autochthonous Crayfish	RNDr. J. Svobodová	Norway Grants – Ministry of the Environment
Chemical Monitoring and Biomonitoring of the River Horní Malše Focused on Fresh Water Pearl Mussel Demands	Ing. V. Kladivová	Norway Grants – Ministry of the Environment (small grant scheme)
Impacts of Drought on Water Quality, the Analysis of the Current Situation and Its Causes	Mgr. P. Rosendorf	Ministry of the Environment
The Implementation of the Rescue Program (RP) of Freshwater Pearl Mussel	Ing. V. Kladivová	Nature Conservation Agency of the Czech Republic
Comprehensive Localization and Categorization of Non-point Agricultural Pollution Localities	Mgr. P. Rosendorf	Povodí Vltavy, s. e.
Bioindication Tests of the Effectivity of Management Measures in Catchments with Occurrence of <i>Margaritifera margaritifera</i>	Mgr. M. Volfová	Dort Prachatice
Monitoring of Macrophytes Community in Teplá Vltava Threatened by River Riding and Selected Chemical and Physical Variables at Specified Sites	Ing. V. Kladivová	Šumava National Park
An Evaluation of Municipal Sources of Pollution in the Catchment of the Švihov Reservoir	Mgr. P. Rosendorf	Povodí Vltavy, s. e.

Hydrochemical Sampling and Analysis for Feasibility Study	Ing. V. Kladivová	Beleco, z. s.
Hydraulic Monitoring and Biological Assessment of Migration Permeability of Water Duct Děčín and Water Work Geesthacht	Ing. J. Musil, Ph.D.	ŘVC
Water Monitoring near the Waste Water Treatment Plants at Puklice and Chlístov Municipalities	Ing. P. Kožený	Kraj Vysočina
River Wood in Watercourses of Ramena řeky Moravy National Nature Reserve: Current Status and Proposal of Management	Mgr. P. Kožený	Nature Conservation Agency of the Czech Republic
Hydrological, Hydromorphological and Biological Research of Changes in Experimental Measures in 2016	Ing. J. Musil, Ph.D.	ŘVC
ASLAB Centre for Assessing Proficiency of Laboratories		
Good laboratory practice	Ing. P. Finger	Ministry of the Environment
ASLAB Accreditation	Ing. R. Dvořák	Joint contract
Courses – Good Laboratory Practice	Ing. P. Finger	Joint contract
Branch of the Economic, Operation and Technical Activity		
Study of discharge conditions for comprehensive landscaping Líšřany u Citolib	K. Havlák	SWECO Hydroprojekt
Study of discharge conditions for comprehensive landscaping Libčeves	K. Havlák	SWECO Hydroprojekt
Study of discharge conditions for comprehensive landscaping Skupice u Postoloprť	K. Havlák	SWECO Hydroprojekt
Sub-basin district plans of Upper Vltava, Lower Vltava and other Danube tributaries – groundwater	K. Havlák	SWECO Hydroprojekt

7 Publishing and Editorial Activities

ANSORGE, L. Aplikace charakterizačního faktoru nedostatku vody ve studiích LCA v podmínkách České republiky. *Vodohospodářské technicko-ekonomické informace*, 2016, roč. 58, č. 6, s. 41–52. ISSN 0322-8916.

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ANSORGE, L., DLABAL, J., and DOSTÁLOVÁ, A. How truthful are water accounting data? *Journal of Urban and Environmental Engineering*, 2016, vol. 10, No. 1, p. 25–34. ISSN 1982-3932.

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8 Basic Information

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