

STOCKHOLM  
JUNIOR  
WATER PRIZE

HUNGARY  
2014



# About the Stockholm Junior Water Prize



The Stockholm Junior Water Prize (SJWP) was established in 1997 and is an annual competition open to young people between the age of 15 and 20, who have conducted water-related projects focusing on local, regional, national or global topics of environmental, scientific, social or technological importance.

The Stockholm Junior Water Prize consists of two parts: the National Competition and the International Final. All the participating countries start off arranging their own National Competition. The winner proceeds to the International Final in Stockholm. As a result of the competitions, thousands of young people around the world develop personal interests, undertake academic studies and often pursue careers in water or environment related fields.

The International Final is held at the World Water Week in Stockholm. It is an event where people from all over the world meet. This generates many opportunities for networking and exposure. The efforts of the participating countries are highlighted globally. The winner receives an award of USD 15,000 (as of 2014) and a handmade blue crystal sculpture. The winner's school is given USD 5000 and the diploma of excellence goes with USD 3000. But it is just taking part that really matters.

The Stockholm Junior Water Prize enjoys Royal Patronage by H.R.H. Crown Princess Victoria of Sweden.

Stockholm International Water Institute administers all the Stockholm Junior Water Prize and awards and serves as its secretariat. See: [www.siwi.org/prizes/stockholmjuniorwaterprize/](http://www.siwi.org/prizes/stockholmjuniorwaterprize/)

## Hungary and the SJWP

Hungary joined the SJWP in 2013. Mr János Áder, President of the Republic has been the patron of the competition since 2014.

*“Water is the source of life. It is the source of our own development and that of human civilization. It is a godsend, which has formed our human culture to the extent that it plays a pivotal role in the life of the faithful, be it Christians, Jews, Muslims, Hindus, Buddhists and all the other venerable religions.”*

*János Áder, President of the Republic*

The national organizer of the SJWP is GWP Hungary Foundation in agreement with the Stockholm International Water Institute. Details of the competition are available at [www.ifvizdij.hu](http://www.ifvizdij.hu).

## Previous winner of the national competition

2013: Dézi Kakas, János Béri and Péter Polák Jr. (Fényi Gyula Jesuit Secondary Grammar School, Miskolc) – The Importance of the Szinva Stream: Biological and Chemical-Physical Examination

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*Finalists of the national contest*

# The Hungarian national final 2014

In 2014 students submitted 13 entries to the competition from different parts of the country. Altogether 31 secondary school students were involved including individual contestants and two and three member teams as well. The projects were written in English according to the requirements of the call and dealt with different topics like surface water bodies, groundwater, karst water, drinking water, industrial pollution, acid rain, local issues and global challenges as well. For the national final five projects were selected by the jury on the basis of the judging criteria of the SJWP.

“ *The Hungarian Water Utility Association is happy to support secondary school students’ projects dealing with rational and sustainable water use and especially the promotion of tap water consumption.* ”

*Edit Nagy secretary general*



*The jury at work.*



The Hungarian national final was organised on the premises of Millenáris Park, Budapest (the venue of the Budapest Water Summit 2013) on 31 May 2014. The finalists were requested to prepare an A0 poster per team displaying the results of their project.

During the final the contestants orally presented their main findings and answered the jury’s questions. Approximately 15 minutes per team were allocated. The presentations and the interviews were conducted in English.

## The jury of the SJWP – Hungary 2014

Chair: *László Somlyódy* - member of the Hungarian Academy of Sciences

Members: *Edit Nagy* - Secretary General at the Hungarian Water Utility Association  
*Marcell Marschall* - R&D leader of GE Power & Water /Water & Process Technologies  
*Judit Rákosi* - Senior consultant of ÖKO Plc.  
*Tamás Krámer* - Associate Professor at Budapest University of Technology and Economics  
*Adrienne Clement* - Associate Professor at Budapest University of Technology and Economics  
*István Salgó* - Chair of Business Council for Sustainable Development in Hungary  
*Csaba Haranghy* - Director General of the Budapest Water Works  
*Károly Kovács* - President of the Hungarian Wastewater Association

Secretary: *József Gayer* - Chair of GWP Hungary Foundation

# Summary of the finalists' projects

## Hungary, the Queen of Europe's water

*Izabella Petró – Karinthy Frigyes Bilingual Secondary School, Budapest*

Starting with a long introduction of Hungary's water, its historical background, present situation and issues, this project aims to draw the attention of the world to one of the most beautiful countries of Europe. The first part provides the reader with general information about the country's geological conditions, water supplies, treasures, the main actions in connection with water and also the present problems. The reader gains an understanding of why Budapest is called the "City of Baths", why we are so proud of our water and how we are trying to exploit the opportunities lying ahead. All the main rivers, lakes and actions under the topic of water are presented including the different types of waters and drainage as well.

The second half of the essay explains how bioenergy is produced and how effective it is in the Hungarian South Pest Sewage Works. Furthermore my personal opinion about the future is formed here explaining what I consider important and necessary to be done or changed in the subsequent years.

Finally, in the last part I would like to give some inspirations for the reader to lay aside the ordinary chemicals used in households since they purportedly contain many harmful substances. These toxins are not only dangerous for human beings but are also hazardous for our waters. The replacement of the synthetic substances is easy and practical, what is more, it saves money. The necessary ingredients are mainly vinegar and baking soda, but please find the extended list hereinafter. Additionally the vast majority of cosmetics can also be replaced by natural materials such as natural butters and oils. By a significant decrease in the usage of chemicals much fewer potentially hazardous substances would get into the rivers and by the leaving of dangerous cosmetics the mineral oil industry could be controlled and as a result our waters could be much cleaner.



# Disappearing Water - The Decrease of Groundwater in Naszály Mountain

*Lili Kenéz, Alma Móritz and Petra Party – Boronkay György Secondary Technical and Grammar School, Vác*



A decline in groundwater levels can be experienced worldwide due to global warming. We browsed through related literature available in Hungary, and we realized that nobody had ever paid attention to our region. We looked for a place not yet largely influenced by urbanization. That is the reason why we chose the outskirts of Vác, which stretches around Mount Naszály. Here, it is not only global warming that has caused the decline but we have to deal with a more complex problem too. Namely, Mount Naszály is still a mining site. This activity is considered to be the primary reason for the change in microclimatic conditions having a negative impact on groundwater levels.

First, due to an apparent absence of flora that disappeared from the area, precipitation simply pours down to the foot of the mountain as there are no plants that could stop its flow.

Secondly, the barren rock surface absorbs and emits heat, therefore there is a large difference between temperatures measured at the mountain and in the city. Consequently, the effect of global warming is increasing. According to a local resident, in the last 20 years the temperature has risen approximately by 15 degrees.

Thirdly, changed wind and air flow conditions are believed to have caused the 'hot-eye' above the mountain. Due to this phenomenon, it rarely rains. The problem is complex because humidity/ water cannot be retained.

The slopes of the mountain have been inhabited since the Middle Ages and they have always been engaged in subsistence agriculture. In the previous century, fruits grown here were traded with all across Europe (e.g. Munich, Vienna). Besides this, growing flowers also used to be significant. With the opening of mines, they were gone and farmers looked for other subsistence activities. The situation has even been aggravated by the decline in groundwater levels. The only place where there is enough water is the foothill region, which is called Well Valley.

We suggest that the only viable way to solve the issues related to Mount Naszály is to recultivate and revive the region.

## Acid rain

*Dóra Sebestyén, Dorottya Horváth and Virág Ötvös – Krúdy Gyula Secondary Grammar School, Győr*

In our project we introduce the causes and effects of acid rain and the opportunities of its precedence. We searched for the development of sulphuric and nitric acids in the atmosphere. We experimented with a water-covered carnation and burned a sulphur tape.

Acid rain also has an impact on statues and we wanted to show the buildings and statues which are damaged due to contaminated raindrops. Acid rain erodes our historical and artistic heritage, which we presented only on a simple rock.

We went in quest of the quality of the river 'Dead' Marcal near our school in Győr. We collected water from it and we studied it. The results are astonishing.

After the investigation of the pH demand of plants we tried to find the solution for acid rain. Liming is an opportunity to stop these rains and the effects of liming on the soil provides a better soil structure and the ratio of the bacteria starts increasing.

The reduction of pollution is the best way to stop acid rain. It means the reduction of the emission of sulphur dioxides by means of hybrid vehicles, catalysts and other industrial methods. These methods are: desulphurization, the combustion method, post combustion method and the limestone injection method.

What we thought really important was collaboration. There are several unknown possibilities which would mean a great help. Only a few of them are: the use of energy-efficient appliances, the regulation of the use of air-conditioners and heating systems and the insulation of homes.

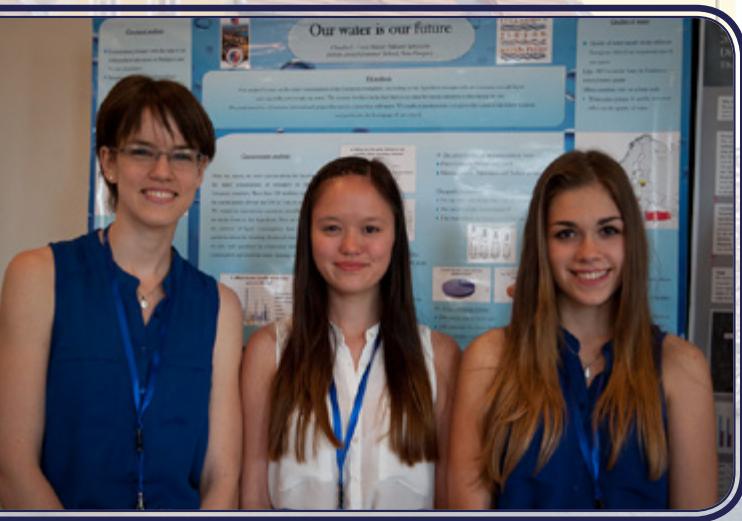
Damages caused by acid rain can be different: direct, indirect; and having an effect on wildlife or lifeless objects. The reduction of acid rain is our common issue.



## Our water is our future

*Claudia Li, Livia Mayer, and Nikolett Sebestyén – Eötvös József Grammar School, Tata*

In the centre of our project the water consuming habits of the European teenagers and the examination of the drinking water of Tata stand. To prove or refute our hypothesis we collected data not only from our school but from 6 other grammar schools in Europe, in 6 different countries. We often experience in our surroundings that our age group mostly drinks soft drinks and juices. Many of them drink mineral water as well but almost none of them drink tap water. According to our hypothesis people living in these European countries have a different cultural background and different water consuming habits.



We made a questionnaire to explore the habits of the consumers. The questions are in thematic order. First we focused on the people's habits related to liquid consumption. There were questions about the consumption of different types of liquid and about the drinking of mineral water as well. Finally, some questions in connection with tap water consumption and domestic water cleaning followed. This was put onto the homepage of our school to make it easier to fill in.

The other examination of our work is about the quality of water. We collected data about the quality of the "Tatabánya XIV/A" well, which provides the tap water in Tata. We were sampling and examining 3 types of tap water in Tata, and finally we put the results into a table. We concluded that the quality of the tap water in Tata was excellent. This is backed by the fact that it was qualified as mineral water in 2009.

We are planning to popularise this information in the future on the basis of our results of the questionnaire and the chemical analysis. We worked out how to campaign for the consumption of tap water in our school and in the primary schools of Tata, in the form of presentations. We believe that the changing of the people's view would result in a healthier, more economical and environmentally friendly life style for them. We are planning to collect some data about the water quality in the given countries, which could be a further step in our work.

*“Hungarian Wastewater Association (HWA) believes that the improvement of the quality of life requires promoting local, regional, and global actions dealing with water related topics. Within the context of improvement, for example, of producing high quality water, the first necessary step is to call the people's attention to the importance of education and awareness-raising concerning the changing of the consumers' behaviour. Thus supporting Stockholm Junior Water Prize was a great opportunity for the Association toward the objective. ”*

*Károly Kovács president*

## The drinking-water supply of Szekszárd - the pollution of our drinking water

*Dominika Gál and Péter Béla Schmidt – Béla the First Secondary Grammar School, Szekszárd*

We have chosen this subject because nowadays the pollution and the lack of drinking-water is a huge issue not only in Hungary but also worldwide. It is truly a global problem because humanity's need for drinking-water exceeds the amount available. The drinking-water supply of the Earth is gained from groundwater (which is 98% of the Earth's fresh-water storage), so its protection should be a priority, yet, nowadays the water supply is getting more and more polluted.

The main reasons are:

- factories and power-plants,
- litter thrown away by people,
- non-existing or poorly executed drainage systems.

There were numerous solutions proposed to solve the problem, however, none of them were fully comprehensive. We are in need of power-plants but they are heavily polluting our environment and water supplies. Such problems are also present in Hungary. Before the demographic booms, when fewer people lived on the Earth, the fast rivers were capable of transporting the litter to the seas, where it could dissolve without leaving a mark behind. However, now, after the great demographic booms, there are so huge amounts of litter thrown in the rivers and other waters that they are not able to carry away all of it to the seas any more – the result is the severe pollution of the Earth and our drinking-water. This phenomenon is also present in small towns such as Szekszárd. It means a great problem in our town to keep our waters clean. The pollution, which has already reached some of our water pumps, is now moving to the drinking-water supply of Szekszárd. To prevent the pollution there are plans of a new drinking-water supply already, which will hopefully be completed in 2015. Although it is neither cheap nor easy to execute these plans, it will be an effective solution. For our research we compiled a survey because we were curious how informed the citizens of Szekszárd about local issues were and whether they were aware of the fact that our city needed a new drinking-water supply because our current water pumps were endangered by pollution. After we had compiled it, we made it available on the internet to make it easier for the citizens of Szekszárd to fill it in. We then asked pedestrians on the streets of Szekszárd, our neighbours, our friends, our classmates and our schoolmates who were over 18 to fill it in. In less than two weeks more than 120 people filled in our survey. After we had gathered the results we tabulated them in Excel. After that we separated the results by age-groups and qualifications, evaluated, sorted and generalized them in the ratio of the answers. However, after we had seen the results we set new goals. Our priorities changed; now our most important goal is to open the eyes of the people (especially the citizens of Szekszárd) to the concerning issues and to ensure local people a better future. We have already presented our essay in several other places because we want the citizens of Szekszárd to be more informed about our drinking-water and issues related to it. Our goal is to have the elementary school goers and even pre-school goers taught about the consequences of water pollution along with the importance and vulnerability of drinking-water.

To sum it up, our main subjects are the pollution of drinking-water, the translocation of the drinking-water supply of Szekszárd, the locals' attitude and knowledge about the issues and the improvement of our future.



“ The 146 years old Budapest Waterworks could not be the company as it is today without the hundreds of committed young people willing to dedicate their career and life to water. Let them be technicians, innovators or planning and operating engineers, our company and the capital city are truly grateful to them.

Unfortunately nowadays water industry is not as appealing for young professionals-to-be as the industry itself would need. People working in the industry are aging and there are fewer and fewer young professionals. This phenomenon points out a difficult future for the business. Stockholm Junior Water Prize is an excellent initiative to draw youngsters' attention to the importance of water and to the opportunities it carries, therefore Budapest Waterworks is a committed supporter of this outstanding competition.

It is never too early to start the recruitment of the young for the industry – The Future Lies Within the Youth. ”

Csaba Haranghy CEO

“ The Stockholm Junior Water Prize gives us a great opportunity to meet with talents who have not only proper education, good communication skills, but also practical experience and willingness to take part in competitions and challenge their inner limits. Water quality, water scarcity and water availability are key questions, and together with our talents we can find a path leading forward concerning them.

As a sponsor we believe that with this prize we provide a possibility to support our future generation to find the synergies between educational capabilities and business needs.

In the name of our Vision – Creating Water Systems For Future Generation – we will work together to find the possibility to support these great initiations. ”

Ádám Ferencz GE Water and Process  
Technologies Hungary Kft.

## The result of the national final

The jury decided on the winner in a closed session. The decision was based on the same judging criteria as used during the international final (Relevance, Creativity, Methodology, Subject Knowledge, Practical Skills, Report and Presentation), considering both the written version of the project and the presentation including the interview. The winners of the Stockholm Junior Water Prize – Hungarian competition 2014 are:

*Claudia Li, Livia Mayer and Nikolett Sebestyén (Eötvös József Grammar School, Tata) with the project: Our water is our future.*

The project dealt with a topical issue: the people's habits of drinking water and raising international awareness of proper water consumption. The applied method was creative, the use of web based questionnaires was innovative. The paper showed a good planning and precise preparation, as well as correct interpretation of the questionnaires. It widened the focus towards an international level involving other European secondary school students in the framework of a Comenius programme. The project also touched the tap water quality of Tata providing background for the study.

As the patron of the Hungarian competition Mr. János Áder, President of the Republic – due to other obligations – was not present, the “SJWP – Hungary 2013” prize was handed over to the winner team by Szilvia Szalóki, Vice-president of the Hungarian Energy and Public Utility Regulatory Authority and Péter Kovács, Head of Department of the Ministry of Interior.

The second place was won by Lili Kenéz, Alma Mórítz and Petra Party for their project “Disappearing Water - The Decrease of Groundwater in Naszály Mountain”. The third place went to Izabella Petró for the project “Hungary, the Queen of Europe's Water”.

The members of the first three teams were awarded a six month subscription to National Geographic. All the finalists were invited to the Budapest Zoo and the Széchenyi Bath as well. The support of the teachers was recognized on stage too.



*Winners with the prize*

**“There are two specially important issues for Grundfos, water and young talents. We are proud that three Hungarian secondary school students and their teacher could show their research work on an international level due to our contribution to the programme. ”**

*László Török General Manager Grundfos Manufacturing Hungary*



*Grundfos special prize winners  
and the representative of the company*



*Presentation during the final*

## **The international final**

Finalists from the participating countries were invited to the World Water Week in Stockholm. There they actively took part in the global conference through a variety of activities for five consecutive days. Inside the conference venue, a poster exhibition of all student projects gave the finalists an opportunity to discuss their projects with the wide range of conference attendees including researchers, politicians and the media.

This year representatives from 29 countries were competing for the SJWP: Argentina, Australia, Belarus, Canada, Chile, China, Cyprus, France, Germany, Hungary, Israel, Italy, Japan, Latvia, Mexico, the Netherlands, Norway, Poland, the Republic of Korea, the Russian Federation, Singapore, South Africa, Sri Lanka, Sweden, Thailand, Turkey, Ukraine, the United Kingdom and the United States. Each of the finalists was further interviewed by a jury of international experts, who decided on the winner.

Hungary was represented by the three member team of Claudia Li, Lívía Mayer and Nikolett Sebestyén (Eötvös József Grammar School, Tata), the winners of the national competition with their project “Our Water is Our Future” (see page 8).



*The jury interviewing the Hungarian team*



*The venue of the World Water Week*



*The winner of SJWP 2014 Hayley Todesco receiving the prize from H.R.H. Crown Princess Victoria*

- *Waste to Water: Biodegrading Naphthenic Acids using Novel Sand Filters • Hayley Todesco, Canada*
- *Effectiveness of slow sand filters (SSF) newly applied as biofilm bioreactors (BB) to biodegrade toxic naphthenic acids (NA) in oil sands tailings ponds was studied using indigenous bacterial isolates in a bench scale SSFBB versus planktonic batch culture bioreactors (PBCB). Planktonic microbial growth, biofilm development and NA reductions determined effectiveness of bioreactors. SSFBB reduced total NA concentrations faster than the PBCB. Cost-effective, sustainable SSFBB could detoxify NA in tailings water preventing more pollution of ground/ surface water resources in the oil sands region.*

Hayley Todesco from Canada won the 2014 Stockholm Junior Water Prize for inventing a method that uses sand filters to treat oil contaminated water. H.R.H. Crown Princess Victoria of Sweden presented the prize at the award ceremony on 3 September. The winner also received an award of USD 15,000 and a sculpture prize.

A Diploma of Excellence was awarded to students Orawan Thasanabenjakul, Pannawat Peanjad and Natthanicha Jairungsr from Thailand for transforming wastewater generated during the production of raw natural rubber sheets to valuable bio-plastic.



*Happy Thai contestants holding the Diploma of Excellence*



*Mingling with other team members  
while awaiting for the result*



*H.R.H. Crown Princess Victoria of Sweden  
greeting the finalists*



*Stockholm Junior Water Prize 2014 finalists with H.R.H. Crown Princess Victoria of Sweden*

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