

youth is the future of water

Stockholm Junior Water Prize Hungary 2020



STOCKHOLM
JUNIOR
WATER PRIZE

HUNGARY

About the Stockholm Junior Water Prize



The winner of the Stockholm Junior Water Prize receives a 15,000 USD award, a crystal prize sculpture, a diploma, as well as the stay in Stockholm. Nevertheless, the participation is what genuinely matters. H.R.H. Crown Princess Victoria of Sweden is the Patron of the Stockholm Junior Water Prize.

Hungary and the SJWP

Hungary joined the SJWP in 2013. Mr. János Áder, the President of the Republic, has been the patron of the competition since 2014. The national organizer of the SJWP is the GWP Hungary Foundation in agreement with the Stockholm International Water Institute. Details of the competition are available at www.ifivizdij.hu.

Previous winners of the national competition

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

2014: Claudia Li, Lívya Mayer and Nikolett Sebestyén (Eötvös József Grammar School, Tata) – Project title: Our Water is Our Future

2015: Márton Czikkely, Tamás Gergely Iványi, Tamás Márkus (Városmajori Grammar School, Budapest) – Project title: The Secrets of Drinking Water – How to Combat Polyethylene Terephthalate

2016: Dávid Kovács, Ákos Iván Szűcs (Kada Elek Secondary School of Economics, Kecskemét) – Project title: What Can We Gain by Using Grey Water?

2017: Anna Tari, Kristóf Stefán, Nikolett Szabó (Szent László High School, Budapest) – Project title: „Tanks of Water”

2018: Bence Zsolt Rappay (I.Béla Secondary Grammar School, Szekszárd) – Project title: „Hillside water management and possibilities of melioration in the Csátári-valley”

2019: Eszter Kun (Szentendrei Mórész Zsigmond Secondary School, Szentendre) – Project title: „Growing plants, growing minds with educational aquaponics system”

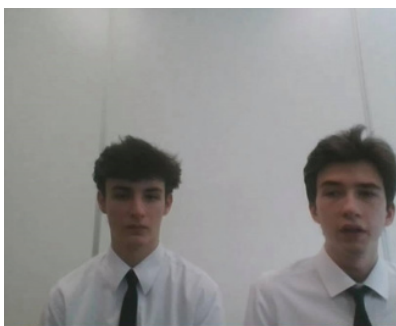
The Stockholm Junior Water Prize (SJWP) was established in 1997 and is an annual competition open to young people between ages 15 and 20, who have conducted water-related projects focusing on local, regional, national or global topics of environmental, scientific, social or technological importance.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

www.siwi.org/prizes/stockholmjuniorwaterprize.

The Stockholm Junior Water Prize consists of two parts: the National Competition and the International Final. All participating countries organize 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 takes place during the World Water Week in Stockholm, an ample event where water people from all over the world meet. This generates many opportunities for networking and exposure. The efforts of the participating countries are highlighted globally.

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Finalists of the National Contest

The Hungarian National Final

Several entries were received for the 2020 Hungarian National Competition. Altogether, there were fifteen secondary school students involved, participating either as individual contestants, or as teams of two members.

The projects were written in English, according to the requirements of the call and dealt with different topics, such as water reuse, the quality of drinking water and of surface waters, environmental awareness, eutrophication, wastewater treatment. Four projects were selected by the jury for the national final on the basis of the SJWP judging criteria.

This year the Hungarian National Final was held online in an unusual way on the 23rd of May 2020. The finalists were requested to prepare a Power Point presentation displaying the results of their project.

During the final, the contestants 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 2020



The jury during the national final

Chair:

- András Szöllősi-Nagy, professor, National University of Public Service

Members:

- Sándor Baranya, Associate Professor at the Budapest University of Technology and Economics
- Anna Bérczi-Siket, consultant, Office of the President of the Republic
- Adrienne Clement, Associate Professor at the Budapest University of Technology and Economics
- Veronika Major, director of the VTK Innosystem Plc.
- Edit Nagy, Secretary General at the Hungarian Water Utility Association
- Zsolt Edgar Rasztovits, Business Development Director for Xylem Water Solution Hungary
- Péter Szűcs, Dean at the University of Miskolc
- Danka Thalmeinerova, consultant

Secretary:

- Monika Jetzin, GWP Hungary Foundation

Summary of the finalists' projects

Designing an automated water collector system to reduce the soil erosion effects of rain and wind

Armand Mehicic and Olivér Herceg – I. Béla Grammar School, Szekszárd

In our dissertation we investigate the soil erosion effects of wind and rainfalls. With the change of these climate elements their destructive power to the soil becomes even greater, and we have developed an automated water collector system as a potential solution. Our investigations took place in the Parásztai-Séd's sub-basin in the Szekszárd Hills. Here, the composition of the soil is loess. We have investigated the precipitation trends, the wind, and temperature, whilst noting the change in the occurrence of drought years. With the determination of soil texture and its maximum water holding capacity, we have come to a conclusion regarding the Hills's erosion sensitivity. We have measured the creek's discharges and the carriage of sediment, which runs down through the hill. Our goal was to investigate the erosion effects of extreme rainfalls. After that, we have estimated the average soil erosion using the general soil loss equation. This research's goal was to prove the upcoming change of water management in the area, to show its effects on the environment, and to allow us to provide a potential solution against the given problem.



Microplastic Hunters

Lili Barnóth and Zsálya Borbála Zsigó – Zrínyi Ilona Secondary School, Nyíregyháza

Our main goal was to somehow measure the occurrence of microplastics in our natural waters. Microplastics and the name suggest are tiny plastic particles that causing an environmental disaster. Our first goal was to filter these particles and to have an automatic counting system. Unfortunately this is really hard to do and we are amateurs and we did not have the right equipment. However we had a little help with the technical side so it came out to be almost free. But we had a second idea to make a setup that filters these microplastics on a bigger scale and would be available to others. We are still in the process of perfecting this technique and we hope it will be help for the environment.

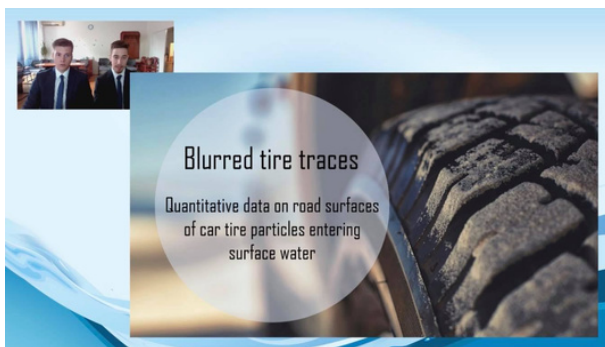


Summary of the finalists' projects

Blurred tire tracks

*Balázs Gyula Urbán and Csaba Máté Kassai – BMSZC Petrik Lajos Secondary School,
Budapest*

It accounts for a significant proportion of the environmental impact of microplastics on public roads the amount of car tire particles generated, from which, according to our calculations 210 g per meter per year for every road section in Hungary. Model value our research area is an overpass over a stream, close to the Danube, from where the rainwater delivers micro-particles to living water without treatment environment. Tracking the process with quantitative data currently still an area without international protocols in which our project sampling, sample handling and identification procedures tested results holding up. Numerous similar sites can be installed for filter testing we have reached the preparatory phase.



Detecting the toxin production of the *Microcystis* species in hungarian lakes

Dóra Alexandra Gyémánt and László Török – Radnóti Miklós Experimental Grammar School, Szeged

In our project we wanted to deal with an issue on environmental protection that affects Hungary. Our main objective was to develop an efficient way to follow the toxin production during algal blooming at an early stage. We would like to detect the starting point of microcystin production of blue-green algae namely the toxic *Microcystis* sp. population. Microcystin is synthesized non-ribosomally by 10 genes. We have designed four biobricks. We used the promoter of the genes, but instead of the genes we used GFP to predict the transcription of the genes responsible for microcystin synthesis. We measured the fluorescence density that was emitted by the GFP when the toxin production had started.



The result of the National Final

The jury decided on the winner in a closed session and announced the result online. The decision was based on the same judging criteria used during the international final (Relevance, Creativity, Methodology, Subject Knowledge, Practical Skills, Report and Presentation), considering both the written project and the presentation, including the interview. The winner of the Stockholm Junior Water Prize – Hungarian competition 2020 is:

Dóra Alexandra Gyémánt and László Török (Radnóti Miklós Experimental Grammar School, Szeged) with the project: "Detecting the toxin production of the Microcystis species in hungarian lakes"



The winners of the SJWP Hungary 2020



The winners of the Diploma of Honor 2020

The Diploma of Honor went to Balázs Gyula Urbán and Csaba Máté Kassai (BMSZC Petrik Lajos Secondary School, Budapest) for the project: "Blurred tire tracks"

For the official Award Ceremony of the 2020 Hungarian SJWP competition President János Áder invited the four finalist teams to his office. There the students shortly explained their results to the President in the presence of the media. Mr. Áder spoke about the importance of involving the young generation into finding solutions for today's challenges of water management and handed over the SJWP 2020 Hungary Prize to the winner.



The winners of the SJWP Hungary 2020 are receiving the prize from President János Áder

The international final

The Stockholm Junior Water Prize 2020 edition was held online. This year, representatives from 29 countries competed for the SJWP: Argentina, Australia, Bangladesh, Belarus, Brazil, Canada, Chile, China, Cyprus, Denmark, Ecuador, France, Germany, Hungary, Israel, Italy, Japan, Latvia, Malaysia, Mexico, Netherlands, Nigeria, Norway, Russian Federation, Republic of Korea, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom and the United States of America.

Hungary was represented by the two-member team formed of Dóra Alexandra Gyémánt and László Török (Radnóti Miklós Experimental Grammar School, Szeged) with them project “Detecting the toxin production of the *Microcystis* species in hungarian lakes”.

The 2020 Stockholm Junior Water Prize was awarded to the students from Japan (Hiroki Matsuhashi, Takuma Miyaki. H.R.H. Crown Princess Victoria of Sweden was announcing the winner during the online award ceremony on 25 August.

Controlling soil runoff and increasing food production by the functional water collection system using traditional Japanese soil solidification technology: “Ta-ta-ki”

Hiroki Matsuhashi, Takuma Miyaki
Japan

In this research, “Ta-Ta-Ki” soil, a traditional Japanese soil solidification technology, was successfully applied to develop a novel multifunctional water collection system to control soil runoff and increase food production with low environmental impact and low cost. Major functions of this system include: (1) collection and retention of rainwater during the rainy season; (2) supply of nutrients to poor soil; and (3) control of soil runoff caused by rainfall. This inexpensive soil solidification technology with high operability can be an effective solution to various water and food shortage problems in developing countries, especially in the arid and semi-arid areas.



The Diploma of Excellence was awarded to a student from the United States of America: Zoe Gotthold for her project: "P.E.N.G.U.I.N.S: Promoting Emulsion Nullification Greenly Using Innovative Nucleation Surface".



This year the new prize was the People's Choice Award. This Prize was given to the students from Bangladesh: Adittya Kumar Chowdhury, Iftekhar Khaled for their project: "Using naturally derived poly glutamic acid in association with Moringa oleifera seeds as a coagulant for treating water".



Online "Flag Parade"

The Hungarian Finalists 2013-2019



2013



2014



2015



2016



2017



2018



2019



The Hungarian Prize

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