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Slovenian National Committee
of the International Geoscience
Programme

ANNUAL REPORT OF THE SLOVENIAN IGGP NATIONAL COMMITTEE FOR 2016

Ljubljana, February 2017

UNESCO**Division of Ecological and Earth Sciences****IGGP Secretary****7, place de Fontenoy****75352 PARIS 07 SP****France****Att.: Patrick MC KEEVER**

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NC Chairperson: Dr. Mirka Trajanova*Geological Survey of Slovenia**Dimičeva ulica 14**1000 LJUBLJANA**Tel.: 386 01 2809 702**Fax : 386 01 2809 753**E-mail: mirka.trajanova@geo-zs.si***NC Secretary: Assoc. Prof. Dr. Nina Zupančič***University Ljubljana, Dept. for Geology**Aškerčeva 12**1000 LJUBLJANA**Tel.: 386 01 470 45 00**Fax : 386 01 470 45 60**E-mail: nina.zupancic@ntf.uni-lj.si***ANNUAL REPORT OF THE SLOVENIAN IGGP NATIONAL COMMITTEE FOR 2016****1. MEMBERS OF THE SLOVENIAN IGGP NATIONAL COMMITTEE**

Since geoparks were adopted under the auspices of UNESCO in 2015, and the IGCP associated with Geoparks, the Slovenian IGCP National Committee took over a new role as the NC of the International Geoscience and Geoparks Program, NC IGGP. It has 15 members at present as follows:

1. Dr. Mirka Trajanova, GeoZS, **chairperson**
2. Assoc. prof. dr. Nina Zupančič, UL, NTF, Dept. for geology and Ivan Rakovec Institute of Paleontology, ZRC SAZU, **secretary**
3. Dr. Miloš Bavec, Geological Survey of Slovenia (GeoZS)
4. Dr. Katica Drobne, Ivan Rakovec Institute of Paleontology, ZRC SAZU
5. Mgr. Suzana Fajmut Štrucl, crossborder Geopark Karavanke/Karawanken
6. Assist. prof. dr. Luka Gale, UL, NTF, Dept. for geology and GeoZS
7. Assist. prof. dr. Špela Goričan, Ivan Rakovec Institute of Paleontology, ZRC SAZU
8. Assist. prof. dr. Mateja Gosar, GeoZS
9. Marjutka Hafner, director of the Slovenian office for UNESCO
10. Assoc. prof. dr. Martin Knez, Karst Research Institute, ZRC SAZU
11. Assist. prof. dr. Tea Kolar-Jurkovšek, GeoZS
12. Assoc. prof. dr. Marko Komac, sole trader
13. Prof. dr. Jože Pezdič, Research organization GEORIS
14. Emeritus prof. dr. Simon Pirc, UL, NTF, Dept. for geology
15. Bojan Režun, univ. dipl. ing. geol., Geopark Idrija

2. INFORMATION ON THE ACTIVITIES IN 2016

Activities in the frame of the IGGP projects intensely followed their motto "Geosciences for the Society", which requires and encourages an interdisciplinary approach to problem solving. In this context, and given the range of themes offered by the International Programme IGCP, Slovenian researchers dealt with very diverse topics. As in previous years, the main part of activities was held in the programs of IGCP.

The role and importance of geosciences in society shows constant growth, which acted stimulating at implementation of the set tasks. Shift of focus in the direction of environmental issues, geohazard and somewhat livelier developments in the field of mineral resources is currently present.

IGCP projects were focused primarily on the research of the national territory, which is the primary mission of our researchers. Nevertheless, they were involved in international activities, which is one of the priorities of UNESCO. The most extensive international cooperation was carried out on research of karst areas, and on environmental projects. Mineral resources were explored in Africa and the Western Balkans, mostly in connection with pollution. Cooperation with neighbouring countries continued.

This year, geoparks were already acting in the global network under the auspice of UNESCO. This fact has significantly raised the level of their visibility. Our two UNESCO Global Geoparks, the Idrija and the Karavanke / Karawanken cross-border geopark have successfully continued and intensified their activities. IGCP and geoparks programs ran in parallel, but with mutual complementarity. Closer cooperation of researchers with the Geoparks was noticed. They were involved in the work of geoparks mostly through consulting, and help in preparing educational and informational materials.

Slovenian NO IGGP has prepared a work program and set of research projects for the year 2016. Four new projects were adopted, while on five projects the co-financing ceased. Research was conducted on 12 IGCP projects, under leadership of 11 researchers. The projects are as follows: **IUGS/IAGC - Geochemical Baselines** (Assist. Prof. Dr. M. Gosar), **IGCP 610: From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary** (Dr. B. Celarc and Assoc. Prof. Dr. M. Dolenc), **IGCP 600: Metallogenesis of Collisional Orogens** (Assoc. Prof. Dr. M. Dolenc), **IGCP 609: Climate-environmental deteriorations during greenhouse: Causes and consequences of short-term Cretaceous sea-level changes** (Dr. K. Drobne), **IGCP 630: Permian-Triassic climatic and environmental extremes and biotic response** (Assist. Prof. Dr. T. Kolar-Jurkovšek), **IGCP 632: Continental Crises of the Jurassic** (Assist. Prof. Dr. T. Kolar-Jurkovšek), **IGCP 637: Heritage Stone Designation** (Dr. Matevž Novak and Assist. Prof. Dr. Simona Jarc), **IGCP 649: Diamond and Recycled Mantle** (Assist. Prof. Dr. Mirjam Vrabec), **IGCP 624: OneGeology** (Dr. Matevž Novak), **IGCP 618: Palaeoclimate information obtained from past-recharged groundwater** (Dr. Nina Rman) and **IGCP 643: Water Resources in Wet Tropics of West-Central Africa** (Dr. Mitja Janža). Co-funding of the project **IGCP 598: Environmental Change and Sustainability in Karst Systems: relation to climate changes and anthropogenic impact** (Assoc. Prof. Dr. M. Knez) has been extended for one year. The project will continue in 2017 under the new title: Critical Zones and Karst Systems.

Program of our **UNESCO Global Geoparks Idrija and Karavanke / Karawanken** chaired by B. Režun and MSc. S. Fajmut Štrucl continuously introduced new contents into their activities and already succeeded in obtaining international projects.

The Slovenian National Committee of UNESCO (SNCU) approved a total sum of 27,000.00 EUR to the IGGP National Committee for co-funding international cooperation in the year 2016. The funds were distributed among researchers involved in the above stated projects with consensus of the IGGP NC members.

3. SHORT SUMMARY OF THE NATIONAL IGGP PROJECTS IN 2016

The scope of work, relevance, and number of researchers involved in each IGGP project are different, but comparable, and all follow the basic priorities of UNESCO, which are also priorities of SNCU. In thirteen IGGP projects, thirteen national project leaders cooperate, one of which is also co-leader of international project. Let us emphasize that the Slovenian researchers in the field of geosciences are well aware of their responsibility to the development of society at large. Therefore, the focus of all IGCP projects moves more and more toward the topics important to society and have a direct practical value.

Most of IGCP projects directly or indirectly deal with environmental themes and geologically conditioned hazards. Environmental research is based mainly on geochemical parameters. Raising public awareness about the importance of geosciences for sustainable development of society enables people to understand geological processes and events on the Earth, and offers them a choice to determine their personal as well as political relations toward the environment. The research results continuously prove that contamination and type of basement, whether of soil or solid rock, are inseparable factors that we must have in mind all the time when we plan its use or any interventions into environment. Depending on the basement sensitivity, i.e. on its composition, retention time of pollutants in it is dependent, and at the same time the degree of our own exposure to risks. In this respect radioactive contamination, which is practically eternal for mankind, is excluded. In terms of geochemistry, the research was focused on particles and exposure to particles in residential areas, as well as to pollution with mercury in Idrija Geopark and also in other parts of Slovenia.

Topic of climate change, which is intertwined with environmental issues and geohazard, is treated by the following five projects: IGCP-598, IGCP-609, IGCP-610, IGCP-630 and IGCP-632. Changes in climate are part of natural processes, but accelerated by human activity, therefore we should not be indifferent towards them. They occur before our eyes, but human memory is too short to be able to reliably predict the direction in which the changes will take place. Much more clearly climate changes can be inferred from geological history, the evidences of which are condensed and recorded in rocks and younger sediments (examples from the transition of Cretaceous to Paleogene and Permian to Triassic, and from recent sediments in the Bay of Koper). We should be worried about our impact on the climate. Therefore, it is of great importance how the commitments, adopted at conferences on climate change (the last in 2015 in Paris), will be realized; probably scarcely anything, as many times until now, because human short-sightedness and selfishness have no limits.

One of more visible projects, which integrates climate change and environmental issues, is the project IGCP 589. Vulnerable karst areas in our country and beyond national borders in Yunan in China and in the territory of Altai in the Russian Federation were investigated. Assoc. prof. dr. M. Knez is co-proposer of the international project on karst also in the new project application entitled Structure, Substance Cycle and Environment Sustainability of the Critical Zone in Karst Systems (2017-2021), which represents logical continuation of the IGCP 589.

By 2016, the range of topics within the IGCP increased with the basic project No. 649 - Diamond and Recycled Mantle. Ultrahighpressure rocks of the eastern Pohorje Mountains in northern Slovenia give an insight into amazing tectonic processes, which uplifted these rocks to the surface. In addition to the scientific importance, the obtained data also have indirect practical value, as they reveal mineral as well as chemical composition of the treated rocks, which can always be used for applicative purposes.

For the first time, among IGCP projects are also two hydrogeological topics that have research-applied basis. Project IGCP 618 connects comprehensive characterization of geothermal aquifers and reflections of past climate change into them, simultaneously calling attention to their sustainable use. Project IGCP 643 deals with the protection of groundwater resources used as drinking water

supply, and particularly with development of methodologies for estimation of groundwater availability.

Newly accepted projects are also IGCP 637: Stone Heritage Designation and IGCP 624: OneGeology. Their content is, to a greater or lesser extent, directly related to the activities of our Geoparks. The latter are subject to periodic evaluation and have to prove their progress, if they wish to remain as UNESCO Global Geopark. This is a reason more to permanently care for their development.

Geoparks successfully carried out their mission of promotion and education in the field of geosciences and linking it to the rest of the natural, and material and intangible cultural heritage. In this purpose, the Idrija and Karavanke / Karawanken Geoparks organized an excursion to the Bakony-Balaton Geopark. The participants were able to see examples of good practice and to make comparison of how successful are the activities carried out in our geoparks.

The main part of the funds for the research work the research teams provide from programs of the Slovenian Research Agency and from European projects. Funds from the SNCU are indispensable for researchers to be able to attend at international meetings. In this way, we are connected to international events with all the projects. This enriches scientific knowledge, and at least as important mutual understanding, which ultimately contributes to building of better society and peace.

Partial or final results of separate IGCP projects were presented on congresses and published in several journals, as shown below.

4. PUBLICATIONS AND PRESENTATIONS

IUGS/IAGC: Geochemical baselines

- Bavec, Špela, Gosar, Mateja, Biester, Harald. Geochemical investigations of Hg in urban soil of Idrija town. V: Book of abstracts, SEH 2016, ISEG 2016 & Geoinformatics 2016, 14-20 August 2016, Galway, Ireland. Galway: National University of Ireland, 2016, pp. 234.
- Bavec, Špela, Gosar, Mateja, Miler, Miloš, Biester, Harald. Geochemical investigation of potentially harmful elements in household dust from a mercury-contaminated site, the town of Idrija (Slovenia). *Environmental geochemistry and health*, 2016, pp. 23, doi: 10.1007/s10653-016-9819-z.
- Bavec, Špela, Gosar, Mateja, Miler, Miloš, Biester, Harald. Geochemical investigations of potentially harmful elements (phes) in household dust of Idrija town. V: Book of abstracts, SEH 2016, ISEG 2016 & Geoinformatics 2016, 14–20 August 2016, Galway, Ireland. Galway: National University of Ireland, 2016, pp. 55.
- Bavec, Špela, Gosar, Mateja. Speciation, mobility and bioaccessibility of Hg in the polluted urban soil of Idrija (Slovenia). *Geoderma*, 2016, vol. 273, pp. 115-130, doi: 10.1016/j.geoderma.2016.03.015.
- Birke, Manfred, Reimann, Clemens, Oorts, Koen, Rauch, Uwe, Demetriades, Alecos, Dinelli, Enrico, Ladenberger, Anna, Halamić, Josip, Gosar, Mateja, Jähne-Klingberg, Fabian. Use of GEMAS data for risk assessment of cadmium in European agricultural and grazing land soil under the REACH regulation. *Applied geochemistry*, 2016, vol. 74, pp. 109-121, doi: 10.1016/j.apgeochem.2016.08.014.
- Gosar, Mateja, Ottesen, Rolf Tore, Reimann, Clemens, Birke, Manfred, et al. GEMAS: mercury in European agricultural and grazing land soils. V: Book of abstracts, SEH 2016, ISEG 2016 & Geoinformatics 2016, 14-20 August 2016, Galway, Ireland. Galway: National University of Ireland, 2016, pp. 223.
- Gosar, Mateja, Šajn, Robert, Teršič, Tamara. Distribution pattern of mercury in the Slovenian soil: geochemical mapping based on multiple geochemical datasets. *Journal of geochemical exploration*, 2016, vol. 167, pp. 38-48, doi: 10.1016/j.gexplo.2016.05.005.
- Miler, Miloš, Gosar, Mateja. Metal-bearing particles in attic and household dust from Pb mining and smelting area as indicators of contribution of past and present sources. V: Book of abstracts, SEH 2016, ISEG 2016 & Geoinformatics 2016, 14–20 August 2016, Galway, Ireland. Galway: National University of Ireland, 2016, pp. 174.

IGCP 598: Environmental Change and Sustainability in Karst Systems: Relations to Climate Change and Anthropogenic Activities

- GABROVŠEK, Franci, KNEZ, Martin, KOGOVSŠEK, Janja, MIHEVC, Andrej, OTONIČAR, Bojan, MULEC, Janez, PERNE, Matija, PETRIČ, Metka, PIPAN, Tanja, PRELOVŠEK, Mitja, SLABE, Tadej, ŠEBELA, Stanka, RAVBAR, Nataša, ZUPAN HAJNA, Nadja. Development challenges in karst regions: sustainable land use planning in the karst of Slovenia. V: TROFIMOVA, Elena (ur.), SALOMON, Jean-Nöel (ur.). *Preserving karst environments and karst caves: karst dynamics, environments, usage and restoration: towards an international karst preservation system*, (Zeitschrift für Geomorphologie, ISSN 0372-8854, ISSN 0044-2798, Supplementband, N. F., vol. 60, suppl. issue 2). Stuttgart: Gebrüder Borntraeger, 2016, str. 293-318. https://www.schweizerbart.de/papers/zfg_suppl/detail/60/86496/Development_challenges_in_karst_regions_sustainable_land_use_planning_in_the_karst_of_Slovenia
- GIČEVSKI, Biljana, PETRIČ, Metka, KOGOVSŠEK, Janja. Interpreting groundwater character from flood pulses and artificial tracer test - a case study of the Slatinski Izvor spring (Republic of Macedonia). V: LEPITKOVA, Sonja (ur.), BOEV, Blažo (ur.). *Zbornik na trudovi*, Tret kongres na Geolozite na Republika Makedonija, Struga 2016, (Geologica Macedonica, ISSN 0352-1206, Posebno izdanie, no. 4). [S. l.]: Makedonsko geološko društvo, 2016, str. 67-76, ilustr.
- KNEZ, Martin, SLABE, Tadej, GABROVŠEK, Franci, KOGOVSŠEK, Janja, KRANJC, Andrej, MIHEVC, Andrej, MULEC, Janez, OTONIČAR, Bojan, PERNE, Matija, PETRIČ, Metka, PIPAN, Tanja, PRELOVŠEK, Mitja, RAVBAR, Nataša, ŠEBELA, Stanka, ZUPAN HAJNA, Nadja, BOSÁK, Pavel, PRUNER, Petr, LIU, Hong, KNEZ, Martin (urednik), SLABE, Tadej (urednik). *Cave exploration in Slovenia : discovering over 350 new caves during motorway construction on classical karst*, (Cave and karst systems of the world). Cham: Springer, cop. 2016. XIII, 324 str., ilustr. ISBN 978-3-319-21202-9. ISBN 978-3-319-21203-6, doi: [10.1007/978-3-319-21203-6](https://doi.org/10.1007/978-3-319-21203-6).
- KNEZ, Martin, SLABE, Tadej, URUSHIBARA-YOSHINO, Kazuko. Karst processes in Minamidaito Island in the Nansei Archipelago - Southwest Japan. V: *Dentro e fuori la montagna : giornate di incontri, divulgazione ed escursioni su Geologia - carsismo - speleologia & paleontologia = Inside and outside the mountain : information and excursion days on Geology - karst - speleology & palaeontology : 2a edizione, Custonaci 27 Maggio - 5 Giugno 2016 : program & abstracts*, Workshop Dentro e fuori la Montagna = Inside and outside the Mountain, 2a edizione, Custonaci, 27 Maggio - 5 Giugno 2016. [Ragusa: CIRS, 2016], str. 23-24.
- KNEZ, Martin, RUGGIERI, Rosario, SLABE, Tadej. Karren above Custonaci. V: *Dentro e fuori la montagna : giornate di incontri, divulgazione ed escursioni su Geologia - carsismo - speleologia & paleontologia = Inside and outside the mountain : information and excursion days on Geology - karst - speleology & palaeontology : 2a edizione, Custonaci 27 Maggio - 5 Giugno 2016 : program & abstracts*, Workshop Dentro e fuori la Montagna = Inside and outside the Mountain, 2a edizione, Custonaci, 27 Maggio - 5 Giugno 2016. [Ragusa: CIRS, 2016], str. 25-27, ilustr.
- KOZEL, Peter, PIPAN, Tanja, CULVER, David C., ŠAJNA, Nina, POLAK, Slavko, NOVAK, Tone. Synchronous ceiling-floor pitfall trapping allows study of microdistribution and habitat preferences of terrestrial subterranean fauna in caves. V: *Abstracts*, 23rd International Conference on Subterranean Biology, 13-17 June 2016 Fayetteville, Arkansas, United States of America. [S. l.: s. n.], 2016, str. 51. http://www.speleobiology.com/icsb2016/wp-content/uploads/bsk-pdf-manager/ICSB_2016_Abstracts_2.pdf.
- MEJIA-ORTIZ, Luis M., CULVER, David C., PIPAN, Tanja, MARTÍNEZ, Christian O., SPROUSE, Peter. The presence of troglomorphic species in Sistema Muévelo Rico, a large cave with limited dark zones in Quintana Roo, México. V: *Abstracts*, 23rd International Conference on Subterranean Biology, 13-17 June 2016 Fayetteville, Arkansas, United States of America. [S. l.: s. n.], 2016, str. 15. http://www.speleobiology.com/icsb2016/wp-content/uploads/bsk-pdf-manager/ICSB_2016_Abstracts_2.pdf.
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- PETRIČ, Metka, KOGOVSŠEK, Janja. Identifying the characteristics of groundwater flow in the Classical Karst area (Slovenia/Italy) by means of tracer tests. *Environmental earth sciences*, ISSN 1866-6280, 2016, vol. 75, issue , str., ilustr., doi: [10.1007/s12665-016-6255-4](https://doi.org/10.1007/s12665-016-6255-4).
- PETRIČ, Metka. Pregled novjših raziskav in aktivnosti na področju hidrogeologije v Sloveniji = Review of some recent researches and activities in the field of hydrogeology in Slovenia. V: *Zbornik radova*, XV Srpski simpozijum o hidrogeologiji sa međunarodnim učešćem, Kopaonik, 14-17. septembar 2016. godine. Beograd: Univerzitet u Beogradu, Rudarsko-geološki fakultet, 2016, str. 97-104, ilustr.
- PETRIČ, Metka, KOGOVSŠEK, Janja, KOGOVSŠEK, Blaž. Uporaba sledilnih poskusov z umetnimi sladili na slovenskem krasu = Use of tracer tests with artificial tracers on Slovene karst. V: *Zbornik radova*, XV Srpski simpozijum o hidrogeologiji sa međunarodnim učešćem, Kopaonik, 14-17. septembar 2016. godine. Beograd: Univerzitet u Beogradu, Rudarsko-geološki fakultet, 2016, str. 195-199, ilustr.
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IGCP 600: Metalogenesis of Collisional Orogens

IGCP 610: From Caspian to Mediterranean: Environmental Change and Human Response during Quaternary

- DOLENEC, Tadej, SERAFIMOVSKI, Todor, LOJEN, Sonja, DOLENEC, Matej, TASEV, Goran, KRAMAR, Sabina, ROGAN ŠMUC, Nastja, VRHOVNIK, Petra. Environmental characterization of lake ecosystems located in Serbo Macedonian massif (FYRM). V: MARIN, Frédéric (ur.). *Biom mineralization: from fundamentals to biomaterials & environmental issues*, (Key Engineering Materials, ISSN 1013-9826, Vol. 672). Pfaffikon: Trans Tech Publications, 2016, vol. 672, str. 295-311
- MEDAKOVIĆ, Davorin, DOLENEC, Tadej, KARLOVIĆ, Danijel, VRHOVNIK, Petra, ROGAN ŠMUC, Nastja, RONČEVIĆ, Sanda, PITAREVIĆ SVEDRUŽIĆ, Lovorka, DOLENEC, Matej. Trace metals in fish biomaterials as environmental indicators: handheld XRF analyses. V: MARIN, Frédéric (ur.). *Biom mineralization: from fundamentals to biomaterials & environmental issues*, (Key Engineering Materials, ISSN 1013-9826, Vol. 672). Pfaffikon: Trans Tech Publications, 2016, vol. 672, str. 328-339, doi: [10.4028/www.scientific.net/KEM.672.328](https://doi.org/10.4028/www.scientific.net/KEM.672.328).

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IGCP 630: Permian-Triassic climatic and environmental extremes and biotic response

- CHEN, Yanlong, KOLAR-JURKOVŠEK, Tea, JURKOVŠEK, Bogdan, ALJINOVIĆ, Dunja, RICHOZ, Sylvain. Early Triassic conodonts and carbonate carbon isotope record of the Idrija - Žiri area, Slovenia. *Palaeogeography, palaeoclimatology, palaeoecology*, ISSN 0031-0182. [Print ed.], 2016, vol. 444, str. 84-100, doi: [10.1016/j.palaeo.2015.12.013](https://doi.org/10.1016/j.palaeo.2015.12.013).
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IGCP 632: Continental Crises of the Jurassic

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IGCP 643: Water Resources in Wet Tropics of West-Central Africa

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5. Activities of the IGCP NC chairperson

Like in previous years, the IGCP NC was kept informed via e-mail in the course of the year. In this way we were solving ongoing issues related to projects, preparation of semi-annual and annual reports for 2016, and plan for the year 2017.

Two regular and one correspondence meetings of the IGCP NC were organized. On January 7th 2016, we discussed realization of the program for the year 2015 and plan for the year 2016. At this meeting, Emeritus Prof. Dr. Simon Pirc and senior research scientist Dr. Katica Drobne were confirmed as honorary members of the IGCP NC. A solemn proclamation took place at the meeting in the premises of the Ministry of Education, Science and Sport on March 15th 2016, where Vice President of the SNCU Dr. Darko Štrajn gave memorial plaques to honorary members. This event was at the same time dedicated to the 40th anniversary of successful activity of Slovenian researchers and their noticeable contribution to the IGCP projects.

Together with the national project leaders, annual report of the IGCP activities for 2015 was prepared, which was sent to the 44. Open Session of the Scientific Board of the International Geoscience Programme in Paris in February 2016. A short presentation of the project's results for the Open Session has been prepared, but it was cancelled at the last minute due to illness. The report for 2016 and plan for 2017 were prepared and discussed with participation of national project leaders at the IGCP NC meeting on November 29th 2016. Consolidated text of the plan 2017 was sent to SNCU on December 6th 2016.

In the course of the year, the IGCP NC chairperson cooperated at the meetings of SNCU, Nacional committee of UNESCO-L'Oreal *For women in Science*, EC of the Slovenian National Forum of UNESCO Global Geoparks, and also joined the excursion to the Bakony-Balaton UNESCO Global Geopark.

Ljubljana, 2017-2-10

Report prepared by

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Slovenian IGCP National Committee

