

Questionnaire
Summary of the main activities of a research institute
of the Slovak Academy of Sciences

Period: January 1, 2016 - December 31, 2021



INSTITUTE OF LANDSCAPE ECOLOGY
SLOVAK ACADEMY OF SCIENCES

Bratislava, 2022

1. Basic information on the institute:

1.1. Legal name and address

Institute of Landscape Ecology
Štefánikova 3
P.O.BOX 254
814 99 Bratislava
Slovak Republic
GPS: 48°08'57.2"N 17°06'24.6"E
directorile@savba.sk

1.2. URL of the institute web site

<http://uke.sav.sk>

1.3. Executive body of the institute and its composition

Directoriat	Name	Age	Years in the position, from - to
Director	Doc., RNDr. Zita Izakovičová, PhD.	63	2012
Deputy director	Mgr. Henrik Kalivoda, PhD.	52	2002
Deputy director	RNDr. Ľuboš Halada, Csc.	61	2012
Scientific secretary	Ing. Dagmar Štefunková, PhD.	62	2002

Add more rows for any changes during the evaluation period

1.4. Head of the Scientific Board

Ing. Jana Špulerová, PhD (2016-2019)
RNDr. Róbert Kanka, PhD. (2019 -)

1.4.1 Composition of the International Advisory Board

Dr. habil. Karsten Grunewald, Leibniz Institute of Ecological Urban and Regional Development, Germany

dr hab. Beata Raszka, prof. nadzw., Wrocław University of Environmental and Life Sciences, The Faculty of Environmental Engineering and Geodesy, Poland

Wolfgang Sulzer, Ao.Univ.Prof. Mag. Dr.rer.nat., University of Graz, Institute of Geography and Regional Science, Austria

1.5. Basic information on the research personnel

1.5.1. Fulltime equivalent work capacity of all employees (FTE all), FTE of employees with university degrees engaged in research projects (FTE researchers)

2016		2017		2018		2019		2020		2021		2016-2021	
FTE all	FTE researchers	FTE all	FTE researchers	FTE all	FTE researchers	FTE all	FTE researchers	FTE all	FTE researchers	FTE all	FTE researchers	average FTE all per year	average FTE researchers per year
49,44	34,43	49,98	31,52	47,49	31,52	47,48	31,14	49,64	32,09	48,40	30,54	48,74	31,87

1.5.2. If applicable, add also a short information on the merger of the institute in the evaluation period. You can also add rows in the above table corresponding to the founding institutes

-

1.6. Basic information on the funding of the institute

1.6.1. Institutional salary budget, other salary budget¹, non-salary budget²

Salary budget	2016	2017	2018	2019	2020	2021	average
Institutional salary budget [millions of EUR]	0,574	0,603	0,673	0,778	0,904	0,950	0,747
Other salary budget [millions of EUR]	0,342	0,443	0,371	0,285	0,325	0,458	0,371
Total salary budget [millions of EUR]	0,916	1,046	1,044	1,063	1,229	1,408	1,118
Non-salary budget [millions of EUR]	0,787	0,776	0,833	0,996	0,958	1,004	0,892

1.7. Mission Statement of the Institute as presented in the Foundation Charter indicating the years when it was adopted and revised

The Institute of Landscape Ecology of the Slovak Academy of Sciences was established by the Resolution of the Presidium of the Slovak Academy of Sciences No. 36 of 22 March 1990. Under Act No. 347/2021 Coll. the Institute changed its legal form from a state contributory institution to a public research institution as of 1 January 2022.

The primary activity of the organisation is to carry out research in landscape ecology, environmental management and related fields of science and technology. Landscape-ecological and environmental research is inherently inter- or multidisciplinary in nature, and therefore the field of research also encompasses the other sciences like geography, social aspects of environmental sciences, soil sciences, zoology, botany and landscape engineering, among other research fields specified in the Foundation Charter of ILE SAS.

The other main activities of the organisation include:

- Provision and management of the research and development infrastructure to which the organisation has ownership or other rights
- Acquisition, processing and dissemination of information in the field of science, technology and knowledge from the organisation's own research and development in the research fields specified in the Foundation Charter of ILE SAS.
- Editing and publishing journals on the subject of Landscape Ecology

¹ Salary budget originating outside the regular budgetary resources of the organization, e.g. from the project funding.

² Includes Goods and Services and PhD fellowships

- Cooperation with universities in the implementation of accredited study programmes of tertiary higher education.
- Cooperation in the field of science and technology with universities and other natural and legal persons who carry out research and development, and with entrepreneurs, in the fields listed in the Foundation Charter of ILE SAS.
- Carrying out business activities in the above-mentioned fields of science and technology on the basis of the requirements of the public administration and in cooperation with other natural and legal persons and entrepreneurs.

1.8. Summary of R&D activity pursued by the institute during the evaluation period in both national and international contexts. Describe the scientific importance and societal impact of each important result/discovery. Explain on general level – the information should be understandable for a non-specialist (recommended 5 pages, max. 10 pages for larger institutes with more than 50 FTE researchers as per Table 1.5.1.)

The Institute of Landscape Ecology SAS is a centre devoted to basic and applied landscape research on an interdisciplinary basis. The interdisciplinary nature of the institute has to be maintained and has to be reflected by the structure of the institute: all the expertise and specialisations necessary for complex landscape research have to be present in the institute.

The Institute is a member of an international network of excellence in long-term ecosystem research.

ILE SAS focuses its activity on the ecological and environmental sciences in Central Europe and in the European context. The concept, focus and structure of the Institute are based on the following:

- The Institute is a research institution;
- The Institute is an educational institution;
- The Institute is the manager and operator of its own dedicated the R&D infrastructure
- The Institute runs certain business activities

The primary activities of ILE SAS are grouped into four basic „pillars“, the state of which we will outline for the assessment period.

1st Pillar: Development of basic scientific research

Basic scientific research is the Institute's most fundamental activity. It is achieved by the continual development of methods and methodologies of basic landscape-ecological research, which ensures the unique position of the Institute in the field of research work. ILE SAS (as one of the few institutions of its kind in Slovakia) carries out complex interdisciplinary landscape ecological research.

Basic research has focused on issues concerning research into the landscape, its components, and its phenomena and processes running in the landscape at different hierarchical levels. Landscape research has an interdisciplinary basis and is based on consideration of the landscape as a geosystem. The same attention is paid to the analytical research of individual landscape components, landscape syntheses and the creation of functional characteristics of the landscape, which are the basis for the planning of optimal and rational use of the landscape and its components. Global changes, including climate changes, sustainable development, and the greening of human activities are the main challenges that have affected and will influence the professional orientation of the Institute, as well as the activities of the Institute during the assessment period. The research activities of the Institute were also strongly influenced by the participation of ILE SAS in various international networks and programs during the assessment period. Between 2016 and 2021 our scientific projects have focused on the following issues:

The implementation of research activities in long-term ecosystem research. Long-term ecological research is fundamental for study of the impact of global changes to ecosystems - it provides a high-quality data, permitting the detection, understanding and prediction of ecosystem and environmental changes, including climate change. ILE SAS is a member of ILTER, global network performing long-term ecological research in a coordinated way, that contributes to the understanding of changes in ecosystems and their impact and links to the socio-economic sphere. The aim of LTER Slovakia, coordinated by ILE SAS, is to provide reliable scientific information and

predictive understanding of ecological and socio-economic processes, and to propose measures to address current and future environmental problems for the scientific community, the managerial sphere and the whole of society. Ecosystem research was conducted at selected locations by ILE SAS during the assessment period at the LTER sites Báb, Kráľova hoľa, Jalovecká dolina, Alpínske vrcholy Tatier and Poloniny. We ran experiments on the impact of nitrogen deposition (Jalovecká dolina) and the combination of nitrogen deposition and increased temperature (Kráľova Hoľa) on alpine meadow ecosystems. We studied vegetation, epigeic invertebrates, soils, soil solution chemistry, biomass, decomposition tests, and also NDVI measurements conducted using field spectroscopy. Research of epigeic invertebrates was conducted at four locations in Báb, where we also worked on 48 permanent sites for vegetation research. In Poloniny LTSEr (long-term socio-ecological research) we carried out experiments focused on the effect of management measures on the structure of grassland communities. Ecological research has also been expanded by adding a socio-economic aspect and establishing platforms for carrying out LTSEr. During the assessment period, research on LTSEr sites focused on tracking and monitoring of ecological and socio-ecological phenomena at two LTSEr platforms: Poloniny and Trnava. At present, this research, and especially the development of infrastructure, is supported by two Horizon 2020 projects: *ELTER PPP - ELTER preparatory phase project* and *ELTER PLUS – European Long-term ecosystem, critical zone and socio-ecological systems research infrastructure plus*.

Observing, monitoring and assessment of mountain flora affected by climate changes.

These activities were carried out within the follow-up activities of the project GLORIA (Global Observation and Research Initiative in Alpine Environments), which aims to create and maintain a monitoring network of research sites for long-term observation of mountain flora. A crucial precondition for keeping such a large-scale network effective, in terms of comparability of data across sites, is a standardized sampling design such as Gloria's Multi-Summit approach. In this project we are observing the effect of climate change on the species composition of vegetation above the tree line. The project began in 2001, with 18 GLORIA target regions in the mountain areas of 13 European countries. In 2008 and 2015 a second and third batch of data were collected and comparison of data from 2001, 2008 and 2015 showed very interesting results, which were published in the journal *Science*. In recent years, the GLORIA network has spread to all continents and overall there are more than one hundred regions with established research sites. Today, this includes 121 regions from Europe, North and South America, Australia, Asia and Africa. In Slovakia, it has been coordinated by the Institute of Landscape Ecology since 2000. A system of permanent sites was established in 2001 on the summits of the following four Tatra peaks: Krížna (1,918.6 m a.s.l.), Veľká kopa (2,052.4 m a.s.l.), Sedieltková kopa (2,061.3 m a.s.l.), and Krátka (2,374.5 m a.s.l.). In 2015, re-collection of data was realized and several articles in high impacted journals with the co-authorship of the ILE SAS staff have been published. Further data re-collection will take place in 2022. Continuous monitoring of species will play an important role in the overall monitoring of ongoing environmental effects on the diversity of plant life in the alpine vegetation zone.

In 2013, Swiss scientists came up with an initiative - known as the sUMMITDiv project - to use older botanical papers as the basis for a research task that aims to analyse changes in the species composition of the peaks over as long a period of time as possible, with some papers spanning up to 145 years. Slovakia joined this research initiative with the participation of the research team of the Institute of Landscape Ecology of the Slovak Academy of Sciences, which used the work of Sagorski and Schneider (1891) containing a detailed inventory of species from more than twenty Tatra peaks, of which nine are currently selected for research. The observed acceleration of plant diversity is strikingly synchronized with the acceleration of global warming, and is not linked to alternative global change drivers. The accelerating increases in species richness on mountain summits demonstrate that acceleration in climate-induced biotic change is occurring even in remote places on Earth, with potentially far-ranging consequences not only for biodiversity, but also for ecosystem functioning and services.

Research of landscape changes and changes of its ecosystems, land use change research and assessment of driving forces behind these changes. Monitoring of landscape changes and land cover was realized within multiple projects, ranging from regional to national to international in scope, also localised in different regions. The dominant project in this area was supported by the Structural Funds *Assessment of landscape changes and their environmental impacts*, which focused on assessing changes in the landscape as a result of socio-economic

development. We focused on assessing the impact of global megatrends on the landscape and its components, impacts on changes in ecosystems, impacts on the quality of individual natural resources and the environment, impacts on the landscape and character, impacts on spatial ecological stability, etc. Special attention was paid to the assessment of the impacts of global megatrends on the Danube river landscape within the cross-border project DREAM SK-AT - Danube river research and management in Slovakia and Austria. In particular, the impacts of changes in ecosystems on the ecosystem services provided by them were assessed. Changes in the agricultural landscape were addressed within the APVV project DEMETRA – *Assessment of recent changes and trends in agricultural landscape of Slovakia*. The project evaluated the scope and distribution of modern changes in the use of the Slovak agricultural landscape after 1990, their trends and impacts on the performance of the main functions of agricultural landscape and their dependent ecosystem services. Conceptually, the project was based on the DPSIR (The Driver-Pressure-State-Impact-Response) approach, evaluating the environmental context of human activities in the form of a causal chain monitoring the causes, status and consequences. The main features of the project are a comprehensive approach with analysis and evaluation of natural and socio-economic factors, emphasis on the use of internationally-established indicators, analysis of development trends with the formulation of possible future scenarios, interconnection of several spatial levels, and combination of analytical procedures with empirical knowledge and involvement of stakeholders. The results of the projects will be used to set indicators of sustainable development and to design a strategy for sustainable agricultural development in the study areas.

A significant part of the research in the field of change assessment was also devoted to assessing the impact of socio-economic development on the creation of landscape types and the specification of important landscape structures not only in terms of nature but also in terms of cultural and historical - so-called „biocultural“ – landscape types, as well as a proposal for a strategy for the preservation and protection of these valuable landscape structures. Biocultural landscapes, a substantial part of which are Traditional Agrarian Landscapes (TAL), are currently threatened mostly by the abandonment of agricultural land and insufficient support for farmers. Research on biocultural types was carried out in the form of VEGA projects (VEGA project: Research of biocultural values of the landscape and VEGA project: Biocultural landscape type).

Assessment of ecosystems and ecosystem services. This has been one of the main topics of ILE SAS during the assessment period. Research on ecosystem services was realized through several projects. The main objective of the APVV project *Evaluation of ecosystem functions and services of the cultural landscape* was a comprehensive assessment of ecosystem services based on selected REPGEs (REPresentative GeoEcosystems) and detailed research into and testing of appropriate indicators in selected model areas for various types of cultural landscapes using the current CICES methodology. The aim of the VEGA project *Diversity of agricultural landscape and its ecosystem services* was to obtain new quantitative and qualitative data for the assessment of ecosystem services for both science and practical applications, with an emphasis on the importance of agricultural landscapes, which are significantly involved in the performance of many functions and benefits because of their complex structure. Cultural ecosystem services have been evaluated in the VEGA projects: *The ecological model of tourism development based on assessment of localization and realization assumptions of landscape with use of GIS tools and quantitation methods* and *Integration of supply of selected ecosystem services for societal demand in terms of developing sustainable forms of tourism*. The issue of ecosystem services has also been addressed in the project *OpenNESS (Operationalisation of Natural Capital and EcoSystem Services - From Concepts to Real-world Applications)*, a project of the 7th EU Framework Programme. Activities of ILE SAS were focused on assessment of the actual state of implementation of the concept of natural capital and ecosystem services in the Slovak Republic and in the model area, and the proposal of methodological tools for landscape and spatial planning which will enable better application of the principles of ecosystem assessment in the Slovak Republic, thus yielding various resulting benefits. In addition to the assessment of strategic documents and legislative instruments in terms of the concept of ES, we implemented an assessment of ecosystem services for Trnava region. Assessment of ecosystem services was realized by a cascade model which was modified for the conditions of the SR, and different modelling techniques were applied for the assessment and modelling of ecosystem services. The most important were: Spreadsheet, GreenFrame, QuickScan and ESTIMAP. The methods developed within the OpenNESS project were applied to the assessment of the potential of the

Slovak landscape for the provision of ecosystem services. A total of 18 ecosystem services relevant to the territory of Slovakia were evaluated, in three basic categories: a) production (5 ecosystem services), b) regulatory (10 ecosystem services) and c) cultural (3 ecosystem services). The results were published in the form of a catalog of ecosystem services in Slovakia, in which UKF in Nitra, the Slovak Environment Agency in Banská Bystrica and ILE SAS participated. ILE SAS employees work as specialists for the evaluation of ecosystem services and ecosystem accounting at the Ministry of the Environment of the Slovak Republic.

The project **“Scientific Support of Climate Change Adaptation and Mitigation of Soil Degradation in Agriculture”** has been implemented under the aegis of the project URANOS, supported by the Structural Funds. 8 scientific research and educational organisations are involved in implementing the project. The project coordinator is ILE SAS. The research activities relate to the important societal issue of creating a data and knowledge base to support decision making and strategic planning in adapting to climate change and minimizing agricultural land degradation, which directly reflects the Research Innovation Strategies for Smart Specialisation (RIS3-SK) long-term objective of reducing climate-change-related risks to the productive functions of agricultural land. For the sake of clarity, research activities have been divided into the 3 following research topics: a) *Development of novel satellite-based approaches for assessment and monitoring of agricultural crops*: A considerable risk for agriculture in our conditions is the occurrence of extreme droughts. An important basis for reducing the negative impacts of drought is the creation of a comprehensive database allowing spatiotemporal analysis of key climatic and crop yield indicators at different spatial and temporal scales. Great emphasis has been placed on the early season estimation of the crop yield indicators based on satellite-based remote sensing methods. The main motivation of this research activity is the operationalization of novel approaches to supporting agricultural management and policies. The research focuses on optimization and automation of research-based processes in the field of data analysis, optimal processing techniques (pixel-based compositing), early-season satellite data crop type classification, and time series analysis. b) *Assessment of future agricultural landscape and ecosystems*: Up-to-date climate scenarios and EU policies (such as the Green deal or Farm to Fork Strategy) are analyzed as key drivers of future changes and adaptations in the agricultural sector. Comprehensive approaches from a number of thematic domains are used for this research activity, namely modeling changes in the agricultural landscape (land management types and land-use intensity), ecosystem modeling and assessment of ecosystem services, and socio-economic impact assessment. Modeling tools benefit from a consolidated database of agricultural land supported by newly-developed algorithms for the processing and classification of satellite and landscape-ecology data (including retrospective land cover classification and Spatio-temporal modeling). An important part of a comprehensive impact assessment on agriculture is taking into account the diversity of socio-economic conditions of Slovakia. The assessment of the how the populations of individual regions of Slovakia perceive various alternative scenarios of changed conditions in agriculture represents an indispensable part of the research activity. c) *Satellite-based assessment of soil degradation*: An in-depth analysis of the current extent of soil degradation with the support of novel satellite-based approaches. We are developing so-called “bare soil mosaics” that serve as the basis for EO-based soil quality mapping. Additionally, variability of soil within parcels is assessed at a broader scale, supporting analysis of yield production zones. The motivation for this is mainly for applied research in the domain of precision farming. We implemented this research activity in partnership with the private sector, supported by the European Space Agency.

Green infrastructure - the Institute of Landscape Ecology has long been dealing with the issue of "green infrastructure". The first concept of green infrastructure in Slovakia, in the form of the concept of a Territorial System of Ecological Stability (TSES), was developed at ILE SAS in 1992. It is based on the concept of a geosystem approach to the landscape. The landscape is understood as a holistic system of components and elements and the interrelationships between them. The TSES concept consists of two basic parts: a) the creation of the framework of the territorial system of ecological stability, and B) a set of ecostabilization measures aimed at strengthening the ecological spatial stability of the territory. Updates and improvements to the concept were gradually developed and implemented. In the evaluated period, the issue of green infrastructure was addressed in the form of two VEGA projects: *Green infrastructure of Slovakia* and *Landscape-ecological aspects of green and blue infrastructure in creation of an optimal spatial*

basis for ecologically stable areas in urban landscape. As part of the national initiative "Creation of regional territorial systems of ecological stability", ILE SAS employees participated in the implementation of 7 regional territorial systems of ecological stability. In the last three years, ILE SAS has developed an updated methodology for documenting local territorial systems of ecological stability. The methodology was extended by the evaluation of ecosystem services provided by individual ecosystems in the landscape. In cooperation with the organisation Esprit, ILE SAS participated in the development of a tool for automated documentation of a territorial system of ecological stability at the local level. The newly-created tool represents a comprehensive basis for an integrated solution of landscaping, water retention in the landscape, anti-erosion, anti-accumulation, anti-flood, as well as spatial-stabilization measures. The automated system will serve as a powerful support tool that will enable users with the necessary expertise and standard GIS knowledge to efficiently create high-quality documents of TSES at local level, and will be an effective tool for decision making in landscape planning and management for a wide range of actors. At present, the system is being tested in several study areas. The professional processing is provided by the Slovak Environment Agency Ministry of Environment.

Assessment of spatial and temporal trends of accumulation of heavy metals and nitrogen in mosses in Slovakia for 25 years has been realized within the international programme ICP Vegetation. This research started in Slovakia as part of ICP Vegetation in 1990 and we have continued it since then. Samples of mosses (preferably *Dicranum sp. div.*, *Hylocomium splendens*, and *Pleurozium schreberi*) were sampled on permanent monitoring plots across Slovakia. As a basis for the research we used a pan-European 16x16 km grid of ICP Forests and filled it in with data on sites in the vicinity of important pollution sources and from monitoring sites of the Slovak Hydrometeorological Institute and Slovak Environmental Agency. We assessed the pollution of Slovakia by heavy metals and other pollutants, with 44 chemical elements in total being analysed, including cadmium - Cd, copper - Cu, lead - Pb, sulfur - S, nitrogen – N, sodium - Na, magnesium - Mg, aluminum - Al, chlorine - Cl, potassium - K, calcium - Ca, Titanium - Ti, and Vanadium - V. The analyses of the content of accumulated chemical elements are performed in cooperation with the Frank Laboratory of Neutron Physics of the Joint Institute for Nuclear Research in Dubna, Russia, and the laboratory of the National Forestry Center in Zvolen.

Basic research was carried out in the scope of national projects (VEGA, APVV) as well as international projects supported by EU grants (7th FP, Horizont 2020, structural funds of the EU, NASA funds, funds for cross-boundary cooperation etc.). During the assessment period ILE SAS participated in two projects of the 7th EU Framework Programme, four HORIZON 2020 projects, one project supported by cross-border cooperation funds, three COST projects, one ESA project, four APVV projects, twenty-six VEGA projects, two projects supported by EU Structural Funds, and many other national and international projects. The international activities of the scientists of ILE SAS have a prominent and abiding position within the institute's activities. The scientific projects of the 7th Framework Programme and HORIZON 2020 created opportunities for permanent contacts, cooperation, and mutual exchange of knowledge, methods, data and results. Young ILE SAS scientists are from the very start of their scientific careers exposed to the work, methods and results of excellent scientists from prominent and renowned scientific institutions in the European Union and elsewhere.

2nd Pillar: Development of applied research

The main goal of this pillar is to transfer scientific knowledge into real practice, especially in the field of the elaboration of basic material on and proposals for the process of landscape planning and decision-making, and also for the environmental legislation process (landscape planning and land consolidation). The Institute is experienced in this field at a domestic as well as an international level (providing materials for the NATURA 2000 international network as well as materials and expertise for new legislation etc.) These activities should continue to be developed in the future too. The study and evaluation of current ecological and environmental problems, the elaboration of proposals for their elimination and prevention, the elaboration of strategies and management plans for the sustainable utilization of the landscape and its elements, the protection of biodiversity, the stability of the landscape and protection of the environment were the main activities of the Institute in the sphere of applied research during the assessment period. During this period, employees of the Institute acted as experts for solving environmental problems, both at the international (EU) and national levels. One of the major activities on the international level was

continuing the long-term participation (since 2001) of the Institute in the European Topic Centre for Biological Diversity (ETC BD). The European Topic Centre for Biological Diversity is a professional organization of the European Environmental Agency (EEA) and its activity is controlled by the task plan of the EEA. ETC BD work is currently focused on three main themes: Support for the biodiversity directives (The Habitats Directive, The Birds Directive); Assessment of biodiversity; and ETC management. ILE SAS cooperates on each task with other partners of the ETC BD consortium, which is made up of 12 organizations. The leading organization is Museum of Natural History in Paris. During the assessment period, the activity focused on the implementation of the Habitats and Birds Directives and on the building of a European network of Natura 2000. Employees of ILE SAS carried out the assessment of favourable statuses of species and habitats conservation of European importance on the basis of reports submitted by EU members under Article 17 of The Habitats Directive.

Other activities directly related to the DG Environment are participation of the Institute in the external monitoring team of the LIFE Programme (LIFE Nature project monitoring and LIFE Environment in Slovakia, Czech Republic, Poland, Hungary, Romania, Slovenia and Croatia) and participation in the team preparation and management of the New Biogeographical Process. Task activities for support of the New Biogeographic Process were conducted to evaluate the state and development of habitats across the different biogeographical regions: the Continental, Pannonian, Steppe and the Black Sea regions. They focused on exploring the historical drivers of changes in land use and their impacts on biodiversity and ecosystem services in Europe. ILE SAS also participated in the testing of criteria for the revision of the Habitats Directive annexes, and also participated in the task of mapping and assessing ecosystems.

ILE SAS was the main coordinator and secretariat of Landscape Europe from October 2011 to February 2018. Landscape Europe is an interdisciplinary network of national research institutions with experience in landscape assessment, planning, policy and education management as well as science and art development to support the country's sustainable development. In the period, there were 20 research institutions from 15 European countries in the network.

Also of note are activities for national decision-making bodies – provision of expertise for and membership in advisory committees and expert groups of the Ministry of Environment, Ministry of Education, Science, Research and Sport (MESRS), and the Government Office etc. In 2014 the Minister of MESRS commissioned ILE SAS to represent the Slovak Republic in the ESFRI consortium for e-science and technology of European infrastructure for biodiversity and ecosystem research - "LIFEWATCH-ERIC". ILE SAS represents the Agricultural and Veterinary Sciences of SAS in the Commission for space activities of the Slovak Republic. During the assessment period employees of the Institute acted as members of many expert commissions as it is Plenum of the Slovak Commission for UNESCO, Slovak Committee of the Human and Biosphere Program (MaB) at the Ministry of Foreign Affairs, Commission for Integrated Landscape Management, Commission for the creation of a new law on the protection of nature and landscape.

3rd Pillar: Educational activities

Educational activities were an important component of ILE SAS as well. These activities were carried out at all levels. The Institute collaborates with the Department of Ecology and Environmental Sciences of Faculty of Natural Sciences, Constantine the Philosopher University in Nitra. Here, the employees of the Institute together with personnel of the Department provide education of the first to third level of university education. The third level of university education is realized in the programme „Environmental Studies“. Other higher-educational activities involved participation of Institute employees in the educational process at the following universities: Comenius University in Bratislava, The Slovak Technical University in Bratislava, Constantine the Philosopher University in Nitra, the Slovak University of Agriculture in Nitra, The Technical University of Zvolen. Scientific employees of the Institute give various lectures, presentations, study materials, consultations, reviews of diploma works, etc. Also significant were the activities of the Institute in environmental education for elementary and secondary schools, where we developed a program of education on sustainable development and created the educational film The landscape and its Sustainable Development, which is still used as a methodological tool for environmental education in several primary and secondary schools. In the Suchá nad Parnou village there was established an Environmental Natural Laboratory under the auspices of the Institute, where we have jointly implemented several educational activities.

4th Pillar: Popularisation and presentation of results

A very important aspect of the institute's R&D activities is the presentation of scientific results to the public. Our popularisation strategy during the assessment period was focused on presentation of scientific knowledge to the public with the aim of developing environmental awareness and improving the level of acceptance and the application of results of scientific projects. Only an educated society can understand the consequences of its actions on ecosystems and the human environment and implement corrective mechanisms in its everyday life. The following activities were deemed necessary to improve environmental knowledge: press conferences, educational films, contributions to the media including the internet, organizing exhibitions, popularisation activities and workshops with active public participation and carrying out common projects. The above-mentioned activities are considered the most important tools for raising public awareness of the need for protection and management of the environment. The Institute and its employees were repeatedly awarded for their popularization activities. The Institute was for the second time awarded the Golden Sickle by the Minister of Agriculture and Rural Development of the Slovak Republic for the original publication *Evaluation of historical structures of the agricultural landscape of Slovakia* at the International Agricultural and Food Exhibition AGROKOMPLEX 2017 in Nitra city.

It should be emphasized that the first pillar, basic scientific research, is considered as the most important, and has the highest priority for the Institute, as it determines the success and future prospects of the ILE.

2. Partial indicators of main activities:

2.1. Research output

2.1.1. Principal types of research output of the institute: basic research/applied research, international/regional (in percentage)

70 % - basic research

30 % - applied research

70% international research

30% regional research

2.1.2 List of selected publications documenting the most important results of basic research. The total number of publications listed for the assessment period should not exceed the average number of employees with university degrees engaged in research projects. The principal research outputs (max. 5, including Digital Object Identifier – DOI if available) should be underlined. Authors from the evaluated organizations should be underlined.

1. STEINBAUER, Manuel J.** - GRYTNES, John-Arvid - JURASINSKI, Gerald - KULONEN, Aino - LENOIR, Jonathan - PAULI, Harald - RIXEN, Christian - WINKLER, Manuela - BARDY-DURCHHALTER, Manfred - BARNI, Elena - BJORKMAN, Anne D. - BREINER, Frank - BURG, Sarah - CZORTEK, Patryk - DAWES, Melissa A. - DELIMAT, Anna - DULLINGER, Stefan - ERSCHBAMER, Brigitta - FELDE, Vivian A. - FERNÁNDEZ-ARBERAS, Olatz - FOSSHEIM, Kjetil F. - GÓMEZ-GARCÍA, Daniel - GEORGES, Damien - GRINDRUD, Erlend T. - HAIDER, Sylvia - HAUGUM, Siri V. - HENRIKSEN, Hanne - HERREROS, María J. - JAROSZEWICZ, Bogdan - JAROSZYNSKA, Francesca - KANKA, Róbert - KAPFER, Jutta - KLANDERUD, Kari - KÜHN, Ingolf - LAMPRECHT, Andrea - MATTEODO, Magali - MORRA DI CELLA, Umberto - NORMAND, Signe - ODLAND, Arvid - OLSEN, Siri L. - PALACIO, Sara - PETEY, Martina - PISCOVÁ, Veronika - SEDLÁKOVÁ, Blažena - STEINBAUER, Klaus - STÖCKLI, Veronika - SVENNING, Jens-Christian - TEPPA, Guido - THEURILLAT, Jean-Paul - VITTOZ, Pascal - WOODIN, Sarah J. - ZIMMERMANN, Niklaus E. - WIPF, Sonja**. Accelerated increase in plant species richness on mountain summits is linked to warming. In *Nature*, 2018, vol. 556, no. 7 700, p. 231-234. (2017: 41.577 - IF, Q1 - JCR, 17.875 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0028-0836. Available at: <https://doi.org/10.1038/s41586-018-0005-6> – Type ADCA, 142 citations
2. BOUWMA, I.** - SCHLEYER, Christian - PRIMMER, Eeva - WINKLER, Klara Johanna - BERRY, Pam - YOUNG, Juliette - CARMEN, Esther - ŠPULEROVÁ, Jana - BEZÁK, Peter - PREDÁ, Elena - VADINEANU, Angheluta. Adoption of the ecosystem services concept in EU policies. In *Ecosystem Services*, 2018, vol. 29, p. 213-222. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.02.014> - Type ADCA, 71 citations
3. SAARIKOSKI, Heli** - PRIMMER, Eeva - SAARELA, Sanna-Riikka - ANTUNES, Paula - ASZALÓS, Réka - BARÓ, Francesc - BERRY, Pam - BLANCO, Gemma Garcia - GÓMEZ-BAGGETHUN, Erik - CARVALHO, Laurence - DICK, Jan - DUNFORD, Rob - HANZU, Mihail - HARRISON, Paula - IZAKOVIČOVÁ, Zita - KERTÉSZ, Miklós - KOPPEROINEN, Leena - KÖHLER, Berit - LANGEMEYER, Johannes - LAPOLA, David Montenegro - LIQUETE, Camino - LUQUE, Sandra - MEDERLY, Peter - NIEMELÄ, Jari - PALOMO, Ignacio - PASTUR, Guillermo Martínez - PERI, Pablo Luis - PREDÁ, Elena - PRIESS, Joerg A. - SANTOS, Rui - SCHLEYER, Christian - TURKELBOOM, Francis - VADINEANU, Angheluta - VERHEYDEN, Wim - VIKSTRÖM, Suvi - YOUNG, Juliette. Institutional challenges in putting ecosystem service knowledge in practice. In *Ecosystem Services*, 2018, vol. 29, p. 579-598. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.07.019> – Type: ADCA, 44 citations
4. ŠPULEROVÁ, Jana - BEZÁK, Peter - DOBROVODSKÁ, Marta - LIESKOVSKÝ, Juraj - ŠTEFUNKOVÁ, Dagmar. Traditional agricultural landscapes in Slovakia: why should we preserve them? In *Landscape research*, 2017, vol. 42, no. 8, p. 891-903. (2016: 0.812 - IF, Q3 - JCR, 0.523

- SJR, Q2 - SJR). (2017 - Current Contents). ISSN 0142-6397. Available at: <https://doi.org/10.1080/01426397.2017.1385749> Type: ADCA, 9 citations
5. PILOTTO, Francesca** - KUHN, I. - ADRIAN, Rita - ALBER, Renate - ALIGNIER, Audrey - ANDREWS, Christopher - BÄCK, Jaana - BARBARO, Luc - BEAUMONT, Deborah - BEENAERTS, Natalie - BENHAM, Sue - BOUKAL, David S. - BRETAGNOLLE, Vincent - CAMATTI, Elisa - CANULLO, Roberto - CARDOSO, Patricia G. - ENS, Bruno - EVERAERT, Gert - EVTIMOVA, Vesela - FEUCHTMAYR, Heidrun - GARCÍA-GONZÁLEZ, Ricardo - GÓMEZ-GARCÍA, Daniel - GRANDIN, Ulf - GUTOWSKI, Jerzy M. - HADAR, Liat - HALADA, Ľuboš - HALASSY, Melinda - HUMMEL, Herman - HUTTUNEN, Kaisa-Leena - JAROSZEWICZ, Bogdan - JENSEN, Thomas C. - KALIVODA, Henrik - SCHMIDT, Inger Kappel - KRÖNCKE, Ingrid - LEINONEN, Reima - MARTINHO, Filipe - MEESENBURG, Henning - MEYER, Julia - MINERBI, Stefano - MONTEITH, Don T. - NIKOLOV, Boris P. - ORO, Daniel - OZOLINS, Davis - PADEDDA, Bachisio M. - PALLETT, Denise - PANSERA, Marco - PARDAL, Miguel Angelo - PETRICCIONE, Bruno - PIPAN, Tanja - PÖYRY, Juha - SCHÄFER, Stefanie M. - SCHAUB, Marcus - SCHNEIDER, Susanne C. - SKUJA, Agnija - SOETAERT, Karline - SPRINGE, Gunta - STANCHEV, Radoslav - STOCKAN, Jenni A. - STOLL, Stefan - SUNDQVIST, Lisa - THIMONIER, Anne - HOEY, Gert Van - VAN RYCKEGEM, Gunther - VISSER, Marcel E. - VORHAUSER, Samuel - HAASE, Peter. Meta-analysis of multidecadal biodiversity trends in Europe [Meta-analýza trendov biodiverzity v Európe počas niekoľkých desaťročí]. In *Nature Communications* [seriál], 2020, vol. 11, no. 1, article no. 3 486. (2019: 12.121 - IF, Q1 - JCR, 5.569 - SJR, Q1 - SJR). (2020 - Current Contents). ISSN 2041-1723. Available at: <https://doi.org/10.1038/s41467-020-17171-y> Type: ADCA
 6. LIESKOVSKÝ, Juraj - BÜRGI, Matthias. Persistence in cultural landscapes: a pan-European analysis. In *Regional Environmental Change*, 2018, vol. 18, no. 1, p. 175-187. (2017: 2.872 - IF, Q2 - JCR, 1.218 - SJR, Q2 - SJR). (2018 - Current Contents). ISSN 1436-3798. Available at: <https://doi.org/10.1007/s10113-017-1192-7> Type: ADCA, 6 citations
 7. PE'ER, Guy** - ZINNGREBE, Yves - MOREIRA, Francisco - SIRAMI, Clelia - SCHINDLER, Stefan - MÜLLER, Róbert - BONTZORLOS, Vasileios - CLOUGH, Dagmar - BEZÁK, Peter - BONN, Aletta - HANSJÜRGENS, Bernd - LOMBA, Angela - MÖCKEL, Stefan - PASSONI, Gioele - SCHLEYER, Christian - SCHMIDT, Jenny - LAKNER, Sebastian. A greener path for the EU Common Agricultural Policy : It's time for sustainable, environmental performance. In *Science*, 2019, vol. 365, iss. 6 452, p. 449-451. (2018: 41.063 - IF, Q1 - JCR, 13.251 - SJR, Q1 - SJR). (2019 - Current Contents). ISSN 0036-8075. Available at: <https://doi.org/10.1126/science.aax3146> - Type: ADCA, 36 citations
 8. SCHINDLER, Stefan - O'NEILL, Fionnuala H. - BIRÓ, Marianna - DAMM, Christian - GASSO, Viktor - KANKA, Róbert - VAN DER SLUIS, Theo - KRUG, Andreas - LAUWAARS, Sophie G. - SEBESVARI, Zita - PUSCH, Martin T. - MARTIN, James R. - EULLER, Katrin - MAUERHOFER, Volker - WRBKA, Thomas. Multifunctional floodplain management and biodiversity effects: a knowledge synthesis for six European countries. In *Biodiversity and Conservation*, 2016, vol. 25, no. 7, p. 1349-1382. (2015: 2.258 - IF, Q1 - JCR, 1.243 - SJR, Q1 - SJR). (2016 - Current Contents). ISSN 0960-3115. Available at: <https://doi.org/10.1007/s10531-016-1129-3> -Type: ADCA, 42 citations
 9. BÜRGI, Matthias - BIELING, Claudia - VON HACKWITZ, Kim - KIZOS, Thanasis - LIESKOVSKÝ, Juraj - MARTÍN, María García - MCCARTHY, Sarah - MÜLLER, Matthias - PALANG, Hannes - PLIENINGER, Tobias - PRINTSMANN, Anu. Processes and driving forces in changing cultural landscapes across Europe. In *Landscape Ecology*, 2017, vol. 32, p. 2 097-2 112. (2016: 3.615 - IF, Q1 - JCR, 1.780 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0921-2973. Available at: <https://doi.org/10.1007/s10980-017-0513-z> - Type: ADCA, 27 citations
 10. TIESKENS, Koen F. - SCHULP, Catharina J. E. - LEVERS, Christian - LIESKOVSKÝ, Juraj - KUEMMERLE, Tobias - PLIENINGER, Tobias - VERBURG, Peter H. Characterizing structure, management intensity and value of agricultural and forest landscapes. In *Land Use Policy : The International Journal Covering All Aspects of Land Use*, 2017, vol. 62, p. 29-39. (2016: 3.089 - IF, Q1 - JCR, 1.408 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0264-8377.

11. DJUKIC, Ika** - KEPFER-ROJAS, Sebastian - SCHMIDT, Inger Kappel - LARSEN, Klaus Steenberg - BEIER, Claus - BERG, B. - VERHEYEN, Egon - MIHÁL, Ivan - BOROVSKÁ, Jana - GERHÁTOVÁ, Katarína - BARNA, Milan - KANKA, Róbert - PISCOVÁ, Veronika - CALIMAN, Adriano - PAQUETTE, Alain - GUTIÉRREZ-GIRÓN, Alba - HUMBER, Alberto - VALDECANTOS, Alejandro - PETRAGLIA, Alessandro - ALEXANDER, Heather - AUGUSTAITIS, Algirdas - SAILLARD, Amélie - RUIZ FERNÁNDEZ, Ana Carolina - SOUSA, Ana I. - LILLEBO, Ana I. - DA ROCHA GRIPP, Anderson - FRANCEZ, André-Jean - FISCHER, Andrea - BOHNER, Andreas - MALYSHEV, Andrey - ANDRIĆ, Andrijana - SMITH, Andy - STANISCI, Angela - SERES, Anikó - SCHMIDT, Anja - AVILA, Anna - PROBST, Anne - OUIN, Annie - KHUROO, Anzar A. - VERSTRAETEN, Arne - PALABRAL-AGUILERA, Arely N. - STEFANSKI, Artur - GAXIOLA, Aurora - MUYS, Bart - BOSMAN, Bernard - AHREND, Bernd - PARKER, Bill - SATTLER, Birgit - YANG, Bo - JURÁNI, Bohdan - ERSCHBAMER, Brigitta - RODRIGUEZ ORTIZ, Carmen Eugenia - CHRISTIANSEN, Casper T. - ADAIR, E. Carol - MEREDIEU, Céline - MONY, Cendrine - NOCK, Charles A. - CHEN, Chi-Ling - WANG, Chiao-Ping - BAUM, Christel - RIXEN, Christian - DELIRE, Christine - PISCART, Christophe - ANDREWS, Christopher - REBMANN, Corinna - BRANQUINHO, Cristina - POLYANSKAYA, Dana - DELGADO, David Fuentes - WUNDRAM, Dirk - RADEIDEH, Diyaa - ORDÓÑEZ-REGIL, Eduardo - CRAWFORD, Edward - PREDA, Elena - TROPINA, Elena - GRONER, Elli - LUCOT, Eric - HORNUNG, Erzsébet - GACIA, Esperança - LÉVESQUE, Esther - BENEDITO, Evanilde - DAVYDOV, Evgeny A. - AMPOORTER, Evy - BOLZAN, Fabio Padilha - VARELA, Felipe - KRISTÖFEL, Ferdinand - MAESTRE, Fernando T. - MAUNOURY-DANGER, Florence - HOFHANS, Florian - KITZ, Florian - SUTTER, Flurin - CUESTA, Francisco - DE ALMEIDA LOBO, Francisco - DE SOUZA, Franco Leandro - BERNINGER, Frank - ZEHETNER, Franz - WOHLFAHRT, Georg - VOURLITIS, George - CARREÑO-ROCADADO, Geovana - ARENA, Gina - PINHA, Gisele Daiane - GONZÁLEZ, Grizelle - CANUT, Guylaine - LEE, H. - VERBEECK, Hans - AUGÉ, Harald - PAULI, Harald - NACRO, Hassan Bismarck - BAHAMONDE, Héctor A. - FELDHAAR, Heike - JÄGER, Heinke - SERRANO, Helena C. - VERHEYDEN, Héléne - BRUELHEIDE, Helge - MEESENBURG, Henning - JUNGKUNST, Hermann - JACTEL, Hervé - SHIBATA, Hideaki - KUOKAWA, Hiroko - ROSAS, Hugo López - VILLALOBOS, Hugo L. Rojas - YESILONIS, Ian - MELECE, Inara - VAN HALDER, Inge - QUIRÓS, Inmaculada García - MAKELELE, Isaac - SENOU, Issaka - FEKETE, István - OSTONEN, Ivika - ROALES, Javier - SHOQEIR, Jawad - LATA, Jean-Christophe - THEURILLAT, Jean-Paul - PROBST, Jean-Luc - ZIMMERMAN, Jess - VIJAYANATHAN, Jeyanny - TANG, Jianwu - THOMPSON, Jill - DOLEŽAL, Jiří - SANCHEZ-CABEZA, Joan-Albert - MERLET, Joël - HENSCHER, Joh - NEIRYNCK, Johan - KNOPS, Johannes - LOEHR, John - VON OPPEN, Jonathan - PORLÁKSDÓTTIR, Jónína Sigríður - LÖFFLER, Jörg - CARDOSO-MOHEDANO, José-Gilberto - ALONSO, José Luis Benito - TOREZAN, Jose Marcelo - MORINA, Joseph C. - JIMÉNEZ, Juan J. - QUINDE, Juan Dario - ALATALO, Juha - SEEGER, Julia - STADLER, J. - KRIISKA, Kaie - COULIBALY, Kalifa - FUKUZAWA, Karibu - SZLAVECZ, Katalin - LAJTHA, Kate - KÄPPELER, Kathrin - JENNINGS, Katie A. - TIELBÖRGER, Katja - HOSHIZAKI, Kazuhiko - GREEN, Ken - YÉ, Lambiénou - RIBEIRO PAZIANOTO, Laryssa Helena - DIENSTBACH, Laura - WILLIAMS, Laura - YAHDIJIAN, Laura. Early stage litter decomposition across biomes. In *Science of the Total Environment*, 2018, vol. 628-629, p. 1369-1394. (2017: 4.610 - IF, Q1 - JCR, 1.546 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0048-9697. Available at: <https://doi.org/10.1016/j.scitotenv.2018.01.012> - Type: ADCA, 72 citations
12. DICK, Jan** - TURKELBOOM, Francis - WOODS, Helen - INIESTA-ARANDIA, Irene - PRIMMER, Eeva - SAARELA, Sanna-Riikka - BEZÁK, Peter - MEDERLY, Peter - LEONE, Michael - VERHEYDEN, Wim - KELEMEN, Eszter - HAUCK, Jennifer - ANDREWS, Chris - ANTUNES, Paula - ASZALÓS, Réka - BARÓ, Francisc - BARTON, David N. - BERRY, Pam - BUGTER, Rob - CARVALHO, Laurence - CZÚCZ, Bálint - DUNFORD, Rob - BLANCO, Gemma Garcia - GEAMANA, Nicoleta - GIUCA, Relu - GRIZZETTI, Bruna - IZAKOVIČOVÁ, Zita - KERTÉSZ, Miklós - KOPPEROINEN, Leena - LANGEMEYER, Johannes - LAPOLA, David Montenegro - LIQUETE, Camino - LUQUE, Sandra - PASTUR, Guillermo Martínez - MARTIN-LOPEZ, Berta - MUKHOPADHYAY, Raktima - NIEMELÄ, Jari - ODEE, David - PERI,

Pablo Luis - PINHO, Patricia - PATRICIO ROBERTO, Gleiciani Bürger - PREDA, Elena - PRIESS, Joerg A. - RÖCKMANN, Christine - FERREIRA DOS SANTOS, Rui - SILAGHI, Diana - SMITH, Ron - VADINEANU, Angheluta - VAN DER WAL, Jan Tjalling - ARANY, Ildikó - BADEA, Ovidiu - BELA, Györgyi - BOROS, Emil - BUCUR, Magdalena - BLUMENTRATH, Stefan - CALVACHE, Marta - CARMEN, Esther - CLEMENTE, Pedro - FERNANDES, Joao - FERRAZ, Diogo - FONGAR, Claudia - GARCÍA-LLORENTE, Marina - GÓMEZ-BAGGETHUN, Erik - GUNDERSEN, Vegard - HAAVARDSHOLM, Oscar - KALÓCZKAI, Ágnes - KHALALWE, Thalma - KISS, Gabriella - KÖHLER, Berit - LAZÁNYI, Orsolya - LELLEI-KOVÁCS, Eszter - LICHUNGU, Rael - LINDHJEM, Henrik - MAGARE, Charles - MUSTAJOKI, Jyri - NDEGE, Charles - NOWELL, Megan - NUSS GIRONA, Sergi - OCHIENG, John - OFTEN, Anders - PALOMO, Ignacio - PATAKI, György - REINVANG, Rasmus - RUSCH, Graciela M. - SAARIKOSKI, Heli - SMITH, Alison - SOY MASSONI, Emma - STANGE, Erik - VAGNES TRAAHOLT, Nora - VÁRI, Ágnes - VERWEIJ, Peter - VIKSTRÖM, Suvi - YLI-PELKONEN, Vesa - ZULIAN, Grazia. Stakeholders' perspectives on the operationalisation of the ecosystem service concept: Results from 27 case studies. In *Ecosystem Services*, 2018, vol. 29, p. 552-565. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.09.015> – Type: ADCA, 30 citations

13. WINKLER, Manuela - LAMPRECHT, Andrea - STEINBAUER, Klaus - HÜLBER, Karl - THEURILLAT, Jean-Paul - BREINER, Frank - CHOLER, Philippe - ERTL, Siegrun - GUTIÉRREZ-GIRÓN, Alba - ROSSI, Graziano - VITTOZ, Pascal - AKHALKATSI, Maia - BAY, Christian - ALONSO, José Luis Benito - BERGSTRÖM, Tomas - CARRANZA, Maria Laura - CORCKET, Emmanuel - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - FOSAA, Anna Maria - GAVILÁN, Rosario - GHOSN, Dany - GIGAURI, Khatuna - HUBER, Doris - KANKA, Róbert - KAZAKIS, George - KLIPP, Martin - KOLLÁR, Jozef - KUDERNATSCH, Thomas - LARSSON, Per - MALLAUN, Martin - MICHELSEN, Ottar - MOISEEV, Pavel - MOISEEV, Dmitry - MOLAU, Ulf - MESA, Joaquín Molero - MORRA DI CELLA, Umberto - NAGY, Laszlo - PETEY, Martina - PUSCAS, Mihai - RIXEN, Christian - STANISCI, Angela - SUEN, Michael - SYVERHUSET, Anne O. - TOMASELLI, Marcello - UNTERLUGGAUER, Peter - URSU, Tudor-Mihai - VILLAR, Luis - GOTTFRIED, Michael - PAULI, Harald. The rich sides of mountain summits - a pan-European view on aspect preferences of alpine plants. In *Journal of Biogeography*, 2016, vol. 43, no. 11, p. 2 261–2 273. (2015: 3.997 - IF, Q1 - JCR, 2.786 - SJR, Q1 - SJR). (2016 - Current Contents). ISSN 0305-0270. Available at: <https://doi.org/10.1111/jbi.12835> – Type: ADCA: 28 citations
14. IZAKOVIČOVÁ, Zita - MEDERLY, Peter - PETROVIČ, František. Long-term land use changes driven by urbanisation and their environmental effects (example of Trnava city, Slovakia). In *Sustainability - open access journal* [serial], 2017, vol. 9, no. 9, article no. 1 553. (2016: 1.789 - IF, Q2 - JCR, 0.548 - SJR, Q2 - SJR). (2017 - Current Contents). ISSN 2071-1050. ADOBE READER is required. Available at: <https://doi.org/10.3390/su9091553> – Type: ADCA, 34 citations
15. ZULIAN, Grazia** - STANGE, Erik - WOODS, Helen - CARVALHO, Laurence - DICK, Jan - ANDREWS, Christopher - BARÓ, Francisc - VIZCAINO, Pilar - BARTON, David N. - NOWEL, Megan - RUSCH, Graciela M. - AUTUNES, Paula - FERNANDES, Joao - FERRAZ, Diogo - FERREIRA DOS SANTOS, Rui - ASZALÓS, Réka - ARANY, Ildikó - CZÚCZ, Bálint - PRIESS, Joerg A. - HOYER, Christian - PATRICIO ROBERTO, Gleiciani Bürger - LAPOLA, David Montenegro - MEDERLY, Peter - HALABUK, Andrej - BEZÁK, Peter - KOPPEROINEN, Leena - VIINIKKA, Arto. Practical application of spatial ecosystem service models to aid decision support. In *Ecosystem Services*, 2018, vol. 29, p. 465-480. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.11.005> – Type: ADCA, 25 citations
16. DOBROVODSKÁ, Marta** - KANKA, Róbert - DAVID, Stanislav - KOLLÁR, Jozef - ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - MOJSES, Matej - PETROVIČ, František - KRIŠTÍN, Anton - STAŠIOV, Slavomír - HALADA, Ľuboš - GAJDOŠ, Peter. Assessment of the biocultural value of traditional agricultural landscape on a plot-by-plot level: case studies from Slovakia. In *Biodiversity and Conservation*, 2019, vol. 28, iss. 10, p. 2 615-2 645. (2018: 3.142 - IF, Q1 - JCR, 1.236 - SJR,

Q1 - SJR). (2019 - Current Contents). ISSN 0960-3115. Available at: <https://doi.org/10.1007/s10531-019-01784-x> Type: ADCA, 14 citations

17. BRAGINA, Eugenia V.** - IVES, Anthony R. - PIDGEON, Anna M. - BALČIAUSKAS, Linas - CSÁNYI, Sándor - KHOYETSKYY, Pavlo - KYSUCKÁ, Katarína - LIESKOVSKÝ, Juraj - OZOLINS, Janis - RANDVEER, Tiit - ŠTYCH, Přemysl - VOLOKH, Anatoliy - ZHELEV, Chavdar - ZIÓŁKOWSKA, Elzbieta - RADELOFF, Volker C. Wildlife population changes across eastern Europe after the collapse of socialism. In *Frontiers in ecology and the environment*, 2018, vol. 16, no. 2, p. 77-81. (2017: 8.302 - IF, Q1 - JCR, 4.677 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 1540-9295. Available at: <https://doi.org/10.1002/fee.1770> Type: ADCA, 6 citations
18. HALADA, Ľuboš - DAVID, Stanislav - HREŠKO, Juraj - KLIMANTOVÁ, Alexandra - BAČA, Andrej - RUSNÁK, Tomáš - BURAL', Miroslav - VADEL, Ľuboš. Changes in grassland management and plant diversity in a marginal region of the Carpathian Mts. in 1999-2015. In *Science of the Total Environment*, 2017, vol. 609, p. 896-905. (2016: 4.900 - IF, Q1 - JCR, 1.652 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0048-9697. Available at: <https://doi.org/10.1016/j.scitotenv.2017.07.066> Type: ADCA, 6 citations
19. FUTSCHIK, Andreas - WINKLER, Manuela** - STEINBAUER, Klaus - LAMPRECHT, Andrea - RUMPF, Sabine B. - BARANČOK, Peter - PALAJ, Andrej - GOTTFRIED, Michael - PAULI, Harald. Disentangling observer error and climate change effects in long-term monitoring of alpine plant species composition and cover [Chyba pozorovateľa a vplyv klimatických zmien v kontexte dlhodobého monitoringu pokryvnosti a druhového zloženia alpínskej vegetácie]. In *Journal of Vegetation Science*, 2020, vol. 31, iss. 1, p. 14-25. (2019: 2.698 - IF, Q1 - JCR, 1.338 - SJR, Q1 - SJR). (2020 - Current Contents). ISSN 1100-9233. Available at: <https://doi.org/10.1111/jvs.12822> Type: ADCA, 1 citation
20. ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - DOBROVODSKÁ, Marta - IZAKOVIČOVÁ, Zita - KENDERESSY, Pavol - VLACHOVIČOVÁ, Miriam - LIESKOVSKÝ, Juraj - PISCOVÁ, Veronika - PETROVIČ, František - KANKA, Róbert - BAČA, Andrej - BARANČOKOVÁ, Mária - BEZÁK, Peter - BEZÁKOVÁ, Magdaléna - BOLTÍŽIAR, Martin - MOJSES, Matej - DUBCOVÁ, Magdaléna - GAJDOŠ, Peter - GERHÁTOVÁ, Katarína - IZSÓFF, Martin - KALIVODA, Henrik - MIKLÓSOVÁ, Viktória - DRÁBOVÁ, Monika - ŠATALOVÁ, Barbora - KRISTÍN, Anton - DANKANINOVÁ, Lenka - KALIVODOVÁ, Eva - MAJZLAN, Oto - MIHÁL, Ivan - STAŠIOV, Slavomír - ŠOLOMEKOVÁ, Tatiana - AMBROS, Michal - BALÁŽ, Ivan - HALABUK, Andrej. *Historické štruktúry poľnohospodárskej krajiny Slovenska : monografia získala ocenenie Zlatý Kosák od ministerky pôdohospodárstva a rozvoja vidieka p. Gabriely Matečnej na Agrokomplexe 2017 v Nitre* [Historical structures of the agricultural landscape of Slovakia. The monograph was awarded the "Zlatý Kosák" – "The Golden Sickle" by the Minister of Agriculture and Rural Development of the Slovak Republic – Gabriela Matečná at Agrokomplex 2017 in Nitra]. Reviewers Mikuláš Huba, Zdeněk Lipský. Bratislava: Veda, 2017. 144 s. Available online: <www.veda.sav.sk>. ISBN 978-80-224-1570-5 Type: AAB, 7 citations
21. GAJDOŠ, Peter - ČERNECKÁ, Ľudmila - FRANC, Valerián - ŠESTÁKOVÁ, Anna. *Pavúky Slovenska : slovenské názvoslovie, prehľad čeladi a súčasné poznatky* [Spiders of Slovakia. Slovak nomenclature, overview of families and present knowledge]. Reviewers: Stanislav Pekár, Zuzana Krumpálová. Bratislava: Veda, 2018. 172 s. Available online: <https://veda.sav.sk/kniha/gajdos-peter-cernecka-ludmila-franc-valerian-sestakova-anna-pavuky-slovenska>. ISBN 978-80-224-1618-4 Type: AAB, 1 citation
22. MIKLÓS, László - DIVIAKOVÁ, Andrea - IZAKOVIČOVÁ, Zita. *Ecological networks and territorial systems of ecological stability* [Ekologické siete a územný systém ekologickej stability]. Cham : Springer, 2018. 159 p. Available at: <https://doi.org/10.1007/978-3-319-94018-2>. ISBN 978-3-319-94017-5 Type: AAA, 1 citation
23. IZAKOVIČOVÁ, Zita** - ŠTEFUNKOVÁ, Dagmar - ŠPULEROVÁ, Jana - KAISOVÁ, Dominika - VRBIČANOVÁ, Gréta - MEDERLY, Peter - PETROVIČ, František - MOČKO, Matej - TURANOVIČOVÁ, Martina - ŠATALOVÁ, Barbora - GUSEJNOV, Simona - KOVÁČ, Tomáš - ČERNECKÝ, Ján - ĎURICOVÁ, Viktória. *Cultural ecosystem services* [Kultúrne ekosystémové služby]. In *A catalogue of ecosystem services in Slovakia : Benefits to society*. - Cham : Springer,

24. LIESKOVSKÝ, Juraj** - KAIM, Dominik - BALÁZS, Pál - BOLTIŽIAR, Martin - CHMIEL, Mateusz - GRABSKA, Ewa - KIRALY, Geza - KONKOLY-GYURÓ, Eva - KOZAK, Jacek - ANTALOVÁ, Katarína - KUCHMA, Tetyana - MACKOVČIN, Peter - MOJSES, Matej - MUNTEANU, Catalina - OSTAFIN, Krzysztof - OSTAPOWICZ, Katarzyna - SHANDRA, Oleksandra - STYCH, Premysl - RADELOFF, Volker C. Historical land use dataset of the Carpathian region (1819-1980). In Journal of Maps, 2018, vol. 14, no. 2, p. 644-651. (2017: 1.600 - IF, Q2 - JCR, 0.607 - SJR, Q2 - SJR). (2018 - Current Contents). ISSN 1744-5647. Available at: <https://doi.org/10.1080/17445647.2018.1502099> Type: ADCA, 14 citations
25. LINDTNER, Peter** - GAJDOŠ, Peter - STAŠIOV, Slavomír - ČILIAK, Marek - PECH, Pavel - KUBOVČÍK, Vladimír. Spider (Araneae) and harvestman (Opiliones) communities are structured by the ecosystem engineering of burrowing mammals [Spoločensť pavúkov (Araneae) a koscov (Opiliones) sú štruktúrované ekosystémovým inžinierstvom cicavcov, ktoré tvoria výhrabiská]. In Insect Conservation and Diversity, 2020, vol. 13, iss. 3, p. 262-270. (2019: 2.729 - IF, Q1 - JCR, 1.129 - SJR, Q1 - SJR). (2020 - Current Contents). ISSN 1752-458X. Available online: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/icad.12382> Type: ADCA, 1 citation
26. ŠATALOVÁ, Barbora - KENDERESSY, Pavol. Assessment of water retention function as tool to improve integrated watershed management (case study of Poprad river basin, Slovakia). In Science of the Total Environment, 2017, vol. 599-600, p. 1 082-1 089. (2016: 4.900 - IF, Q1 - JCR, 1.652 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0048-9697. Available at: <https://doi.org/10.1016/j.scitotenv.2017.04.227> Type: ADCA, 10 citations
27. ŠATALOVÁ, Barbora** - ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - DOBROVODSKÁ, Marta - VLACHOVIČOVÁ, Miriam - KOZELOVÁ, Ivana. Monitoring and evaluating the contribution of the rural development program to high nature value farmland dominated by traditional mosaic landscape in Slovakia [Monitorovanie a hodnotenie prínosu Programu rozvoja vidieka pre územia s vysokou prírodnou hodnotou s prevládajúcou tradičnou mozaikovou štruktúrou na Slovensku]. In Ecological Indicators, 2021, vol. 126, article no. 107 661. (2020: 4.958 - IF, Q2 - JCR, 1.315 - SJR, Q1 - SJR). (2021 - Current Contents). ISSN 1470-160X. Available at: <https://doi.org/10.1016/j.ecolind.2021.107661> Type: ADCA, 2 citations
28. DICK, Jan** - ORENSTEIN, Daniel E. - HOLZER, Jennifer M. - WOHNER, Christoph - ACHARD, Anne-Laure - ANDREWS, Christopher - AVRIEL-AVNI, Noa - BEJA, Pedro - BLOND, Nadège - CABELLO, Javier - CHEN, Chi-Ling - DÍAZ-DELGADO, Ricardo - GIANNAKIS, Georgios V. - GINGRICH, Simone - IZAKOVIČOVÁ, Zita - KRAUZE, Kinga - LAMOUROUX, Nicolas - LECA, Stefan - MELECIS, Viesturs - KERTÉSZ, Miklós - MIMIKOU, Maria - NIEDRIST, Georg - PISCART, Christophe - POSTOLACHE, Carmen - PSOMAS, Alexander - SANTOS-REIS, Margarida - TAPPEINER, Ulrike - VANDERBILT, Kristin - VAN RYCKEGEM, Gunther. What is socio-ecological research delivering? A literature survey across 25 international LTSE platforms. In Science of the Total Environment, 2018, vol. 622-623, p. 1225-1240. (2017: 4.610 - IF, Q1 - JCR, 1.546 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0048-9697. Available at: <https://doi.org/10.1016/j.scitotenv.2017.11.324> Type: ADCA, 14 citations
29. GUIOMAR, N.** - GODINHO, S. - PINTO-CORREIA, Teresa - ALMEIDA, M. - BARTOLINI, F. - BEZÁK, Peter - BIRÓ, Marianna - BJORKHAUG, H. - BOJNEC, Š. - BRUNORI, G. - CORAZZIN, M. - CZEKAJ, M. - DAVIDOVA, S. - KANIA, J. - KRISTENSEN, S. - MARRACCINI, E. - MOLNÁR, Zs. - NIEDERMAYR, J. - O'ROURKE, E. - ORTIZ-MIRANDA, D. - REDMAN, M. - SIPILÄINEN, T. - SOOVÄLI-SEPPING, H. - ŠÚMANE, S. - SUROVÁ, D. - SUTHERLAND, L. A. - TCHERKEZOVA, E. - TISENKOPFS, T. - TSILIGIRIDIS, T. - TUDOR, Monica-Mihaela - WAGNER, K. - WÄSTFELT, A. Typology and distribution of small farms in Europe: Towards a better picture. In Land Use Policy: The International Journal Covering All Aspects of Land Use, 2018, vol. 75, p. 784-798. (2017: 3.194 - IF, Q1 - JCR, 1.348 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0264-8377. Available at: <https://doi.org/10.1016/j.landusepol.2018.04.012> Type: ADCA, 23 citations
30. KOZELOVÁ, Ivana** - ŠPULEROVÁ, Jana - MIKLÓSOVÁ, Viktória - GERHÁTOVÁ, Katarína - IZAKOVIČOVÁ, Zita - KALIVODA, Henrik - KALIVODOVÁ, Michaela - KANKA, Róbert. The role

of artificial ditches and their buffer zones in intensively utilized agricultural landscape [Rola umelých zavlažovacích kanálov a ich blízkeho okolia v intenzívne obhospodarovanej poľnohospodárskej krajine]. In *Environmental Monitoring and Assessment*, 2020, vol. 192, article no. 656. (2019: 1.903 - IF, Q3 - JCR, 0.571 - SJR, Q2 - SJR). (2020 - Current Contents). ISSN 0167-6369. Available at: <https://doi.org/10.1007/s10661-020-08610-w> Type: ADCA, 1 citation

31. KRNÁČOVÁ, Zdena - HREŠKO, Juraj - VLACHOVIČOVÁ, Miriam. An evaluation of soil retention potential as an important factor of water balance in the landscape. In *Moravian Geographical Reports*, 2016, vol. 24, no. 3, p. 44-54. (2015: 1.093 - IF, Q3 - JCR, 0.507 - SJR, Q2 - SJR). (2016 - Current Contents, WOS, SCOPUS). ISSN 1210-8812. Available at: <https://doi.org/10.1515/mgr-2016-0016> Type: ADCA, 1 citation
32. ŽARNOVIČAN, Hubert** - KOLLÁR, Jozef - FALŤAN, Vladimír - PETROVIČ, František - GÁBOR, Marian. Management and land cover changes in the Western Carpathian traditional orchard landscape in the period after 1948 [Manažment a zmeny krajinskej pokrývky v tradičnej sadovej krajine v Západných Karpatoch v období po roku 1948]. In *Agronomy-Basel*, 2021, vol. 11, no. 2, art. no. 366. (2020: 3.417 - IF, Q1 - JCR, 0.707 - SJR, Q1 - SJR). (2021 - Current Contents). ISSN 2073-4395. Available at: <https://doi.org/10.3390/agronomy11020366> Type: ADCA, 2 citations

2.1.3 List of monographs/books published abroad

AAA01 MIKLÓS, László - DIVIAKOVÁ, Andrea - IZAKOVIČOVÁ, Zita. *Ecological networks and territorial systems of ecological stability* [Ekologické siete a územný systém ekologickej stability]. Cham: Springer, 2018. 159 p. Available at: <https://doi.org/10.1007/978-3-319-94018-2>. ISBN 978-3-319-94017-5

AAA02 MIKLÓS, László - KOČICKÁ, Erika - IZAKOVIČOVÁ, Zita - KOČICKÝ, Dušan - ŠPINEROVÁ, Anna - DIVIAKOVÁ, Andrea - MIKLÓSOVÁ, Viktória. *Landscape as a geosystem* [Krajina ako geosystém]. Cham: Springer, 2018. 161 p. ISBN 978-3-319-94023-6

ABA01 IZAKOVIČOVÁ, Zita** - MIKLÓS, László - ŠPULEROVÁ, Jana. Basic principles of sustainable land use management [Základné princípy trvalo udržateľného využívania krajiny. In *Súčasné trendy v krajinnékoekologickom výskume*]. In *Current trends in landscape research: Innovations in landscape research*. - Cham: Springer Nature, 2019, p. 395-423. ISBN 978-3-030-30068-5. Available online: <<https://www.springer.com/gp/book/9783030300685>>

ABA02 ČERNECKÝ, Ján** - ŠPULEROVÁ, Jana - ŽURICOVÁ, Viktória - MEDERLY, Peter - JANČOVIČ, Martin - HREŠKO, Juraj - MOČKO, Matej. Regulatory ecosystem services and supporting ecosystem functions [Regulačné ekosystémové služby a podporné ekosystémové funkcie]. In *A catalogue of ecosystem services in Slovakia: Benefits to society*. - Cham: Springer, 2020, p. 91-185. ISBN 978-3-030-46507-0. Available online: <<https://www.springer.com/gp/book/9783030465070>>

2.1.4. List of monographs/books published in Slovakia

AAB01 MOYZEOVÁ, Milena - MIKLÓS, László - ŠATALOVÁ, Barbora - IZAKOVIČOVÁ, Zita - OSZLÁNYI, Július - KENDERESSY, Pavol - ŠTEFUNKOVÁ, Dagmar - KRNÁČOVÁ, Zdena. *Hodnotenie kvality životného prostredia vidieckych sídiel (na príklade vidieckych sídiel okresu Trnava)* [Evaluation of the quality of the environment of rural settlements (on the example of rural settlements in Trnava district)]. Bratislava: Ústav krajinskej ekológie SAV, 2015. 280 p. ISBN 978-80-89325-26-9

AAB02 KALIVODOVÁ, Eva - KALIVODA, Henrik - KALIVODOVÁ, Michaela - ORBÁNOVÁ, Eva. *Stavovce Záhoria: výberová bibliografia*. [Vertebrates of Záhorie: a selected bibliography. Bratislava]: Ústav krajinskej ekológie SAV, 2017. 98 s. ISBN 978-80-89325-29-0

AAB03 ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - DOBROVODSKÁ, Marta - IZAKOVIČOVÁ, Zita - KENDERESSY, Pavol - VLACHOVIČOVÁ, Miriam - LIESKOVSKÝ, Juraj - PISCOVÁ, Veronika - PETROVIČ, František - KANKA, Róbert - BAČA, Andrej - BARANČOKOVÁ, Mária - BEŽÁK, Peter - BEŽÁKOVÁ, Magdaléna - BOLTIŽIAR, Martin - MOJSES, Matej - DUBCOVÁ, Magdaléna - GAJDOŠ, Peter - GERHÁTOVÁ, Katarína - IZSÓFF, Martin - KALIVODA, Henrik -

MIKLÓSOVÁ, Viktória - DRÁBOVÁ, Monika - ŠATALOVÁ, Barbora - KRIŠTÍN, Anton - DANKANINOVÁ, Lenka - KALIVODOVÁ, Eva - MAJZLAN, Oto - MIHÁL, Ivan - STAŠIOV, Slavomír - ŠOLOMEKOVÁ, Tatiana - AMBROS, Michal - BALÁŽ, Ivan - HALABUK, Andrej. *Historické štruktúry poľnohospodárskej krajiny Slovenska: monografia získala ocenenie Zlatý Kosák od ministerky pôdohospodárstva a rozvoja vidieka p. Gabriely Matečnej na Agrokomplexe 2017 v Nitre* [Historical structures of the agricultural landscape of Slovakia. The monograph was awarded the "Zlatý Kosák" – "Golden Sickle" - by the Minister of Agriculture and Rural Development of the Slovak Republic, Gabriela Matečná at Agrokomplex 2017 in Nitra]. Reviewers Mikuláš Huba, Zdeněk Lipský. Bratislava: Veda, 2017. 144 s. Available on the web: <www.veda.sav.sk>. ISBN 978-80-224-1570-5

AAB04 ADAMEC, Michal - DOKUPILOVÁ, Dušana - CHRENKO, Milan - FILČÁK, Richard - IZAKOVIČOVÁ, Zita - KADLEČÍK, Ján - POVAŽAN, Radoslav - SZEMESOVÁ, Janka - ŠPULEROVÁ, Jana - ŠTASTNÝ, Pavel. *Scenáre vývoja v životnom prostredí 2020+: udržateľný rast, biodiverzita a zmeny klímy*. [Environmental scenarios 2020+: sustainable growth, biodiversity and climate change] Eds: Richard Filčák, Radoslav Považan, Reviewers: Eva Viestová, Daniel Škobla. 1. vyd. Bratislava: Centrum spoločenských a psychologických vied, Slovenská akadémia vied, 2017. 97 s. Available on the web: <<http://www.prog.sav.sk/scenare-vyvoja-v-zivotnom-prostredii-2020-udrzatelny-rast-biodiverzita-zmeny-klimy>>. ISBN 978-80-89524-23-5

AAB05 GAJDOŠ, Peter - ČERNECKÁ, Ľudmila - FRANC, Valerián - ŠESTÁKOVÁ, Anna. *Pavúky Slovenska: slovenské názvoslovie, prehľad čeladi a súčasné poznatky* [Spiders of Slovakia. Slovak nomenclature, overview of families and present knowledge]. Reviewers: Stanislav Pekár, Zuzana Krumpálová. Bratislava: Veda, 2018. 172 s. Available on the web: <<https://veda.sav.sk/kniha/gajdos-peter-cernecka-ludmila-franc-valerian-sestakova-anna-pavuky-slovenska>>. ISBN 978-80-224-1618-4

AAB06 PISCOVÁ, Veronika - HRNČIAROVÁ, Tatiana - HREŠKO, Juraj - DOBROVODSKÁ, Marta - IZAKOVIČOVÁ, Zita - IZSÓFF, Martin - KALIVODA, Henrik - KANKA, Róbert - KENDERESSY, Pavol - POVAŽAN, Radoslav - ROHÁČ, Ján - SLABEJOVÁ, Monika - SLIVINSKÝ, J. - ŠPULEROVÁ, Jana - ŠVAJDA, Juraj - TOPERCER, Ján - VLACHOVIČOVÁ, Miriam - BOROVSKÝ, Igor - HURTA, Vladimír. *Využívanie vysokohorskej krajiny a jeho dôsledky na zmenu prostredia (na príklade Tatier a Nízkyh Tatier)* [Use of the alpine landscape and its impact on changes in the environment (case study of Tatras and Low Tatras)]. Bratislava: Veda, 2018. 250 s. Available online: <<https://veda.sav.sk/kniha/piscova-veronika-a-kolektiv-vyuzivanie-vysokohorskej-krajiny-a-jeho-dosledky-na-zmenu-prostredia-na-priklade-tatier-a-nizkyh-tatier>>. ISBN 978-80-224-1585-9

AAB07 MEDERLY, Peter - ČERNECKÝ, Ján - ŠPULEROVÁ, Jana - IZAKOVIČOVÁ, Zita - JANČOVIČ, Martin - ĎURICOVÁ, Viktória - GUSEJNOV, Simona - HREŠKO, Juraj - PETROVIČ, František - ŠTEFUNKOVÁ, Dagmar - ŠATALOVÁ, Barbora - MOČKO, Matej - VRBIČANOVÁ, Gréta - KAISOVÁ, Dominika - TURANOVIČOVÁ, Martina - KOVÁČ, Tomáš - LACO, Ivan. *Katalóg ekosystémových služieb Slovenska* [Catalog of ecosystem services in Slovakia]. Banská Bystrica: Štátna ochrana prírody SR, 2019. 215 s. ADOBE READER is required. Available online: <<http://www.sopsr.sk/natura/dokumenty/Katalog-ES.pdf>>. ISBN 978-80-8184-067-8

AAB08 ČERNECKÝ, Ján - GAJDOŠ, Peter - ĎURICOVÁ, Viktória - ŠPULEROVÁ, Jana - ČERNECKÁ, Ľudmila - ŠVAJDA, Juraj - ANDRÁŠ, Peter - ULRYCH, Libor - RYBANIČ, Rastislav - POVAŽAN, Radoslav. *Hodnota ekosystémov a ich služieb na Slovensku* [Value of ecosystems and their services in Slovakia]. Reviewers Zita Izakovičová, Peter Mederly. Banská Bystrica: Štátna ochrana prírody SR, 2020. 166 s. ADOBE READER is required. Available online: <<http://www.sopsr.sk/files/hodnota-ekosys.pdf>>. ISBN 978-80-8184-078-4

AAB09 ČERNECKÝ, Ján - ČULÁKOVÁ, Jana - ĎURICOVÁ, Viktória - SAXA, Andrej - ANDRÁŠ, Peter - ULRYCH, Libor - ŠUVADA, Robert - GALVÁNKOVÁ, Janka - LEŠOVÁ, Andrea - HAVRANOVÁ, Ivana. *Správa o stave biotopov a druhov európskeho významu za obdobie rokov 2013 - 2018 v Slovenskej republike* [Conservation status of habitats and species of Community interest in the period of 2013 - 2018 in the Slovak Republic]. Banská Bystrica: ŠOP SR, 2020. 109 s. ADOBE READER is required. Available online: <http://www.sopsr.sk/natura/dokumenty/Monografia_reporting_art17_2013_2018.pdf>. ISBN 978-80-8184-076-0

AAB10 ČERNECKÝ, Ján - LEŠO, P. - RIDZOŇ, Jozef - KRIŠTÍN, Anton - KARASKA, Dušan - DAROLOVÁ, Alžbeta - FULÍN, Miroslav - CHAVKO, Jozef - BOHUŠ, Mirko - KRAJNIAK, Dušan - ĎURICOVÁ, Viktória - LEŠOVÁ, Andrea - ČULÁKOVÁ, Jana - SAXA, A. - DURKOŠOVÁ, Jana - ANDRAŠ, Peter. *Stav ochrany vtáctva na Slovensku v rokoch 2013 –2018* [Conservation status of birds in 2013 –2018 in Slovakia]. Reviewers Peter Urban, Peter Puchala. Banská Bystrica: Štátna ochrana prírody SR, 2020. 105 s. Available online: <http://www.sopsr.sk/news/file/Monografia_vtaky_reporting_18_12_2020.pdf>. ISBN 978–80–8184–084–5

AAB11 CELER, Slavomír - PISCOVÁ, Veronika - HREŠKO, Juraj. *Geomorfologicko-vegetačné aspekty súčasného vývoja krajiny Vysokých Tatier* [Geomorphological-vegetation aspects of the current development of the High Tatras landscape]. Nitra: Univerzita Konštantína Filozofa v Nitre, 2021. 95 s. Prírodovedec 749. ISBN 978-80-558-1686-9

AAB12 MERGANIČ, Ján - ALLMAN, Michal - ALLMANOVÁ DUDÁKOVÁ, Zuzana - BAHÝL', Ján - FERENČÍK, Michal - JAKUBIS, Matúš - JANKOVSKÝ, Martin - JUŠKO, Vladimír - KARDOŠ, Miroslav - MELOUN, Daniel - MERGANIČOVÁ, Katarína - MISTRÍK, Milan - MOKROŠ, Martin - SITKO, Roman - TOMAŠTÍK, Júlián - VALENT, Peter - VLČKOVÁ, Mária - VÝBOŠŤOK, Jozef. *Disturbancie v lesných ekosystémoch a možnosti ich kvantifikácie a predikcie pre potreby lesného hospodárstva: vedecká monografia* [Disturbances in forest ecosystems and possibilities to quantify them for the needs of a forest manager]. Reviewers Tomáš Hlásny, Ladislav Kulla. Zvolen: Technická univerzita vo Zvolene, 2020. 441 p. ISBN 978-80-228-3203-8

2.1.5. List of other scientific outputs specifically important for the institute, max. 10 items for institute with less than 50 FTE researchers, 20 for institutes with 50 – 100 FTE researchers and so on

1. HERNÁNDEZ-MORCILLO, Mónica - BIELING, Claudia - BÜRGI, Matthias - LIESKOVSKÝ, Juraj - PALANG, Hannes - PRINTSMANN, Anu - SCHULP, Catharina J. E. - VERBURG, Peter H. - PLIENINGER, Tobias. Priority questions for the science, policy and practice of cultural landscapes in Europe. In *Landscape Ecology*, 2017, vol. 32, p. 2 083-2 096. (2016: 3.615 - IF, Q1 - JCR, 1.780 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0921-2973. Available at: <https://doi.org/10.1007/s10980-017-0524-9> Type: ADCA, 13 citations
2. VYSKUPOVÁ, Monika - KRŇÁČOVÁ, Zdena** - PAVLIČKOVÁ, Katarína. Vulnerability of the landscape as a tool for determining a suitable model of tourism development [Zraniteľnosť krajiny ako nástroja na určenie vhodného modelu rozvoja cestovného ruchu]. In *Sustainability*, 2021, vol. 13, article no. 5 622. (2020: 3.251 - IF, Q2 - JCR, 0.612 - SJR, Q1 - SJR). (2021 - Current Contents). ISSN 2071-1050. Available at: <https://doi.org/10.3390/su13105622> Type: ADCA, 0 citations
3. KRŇÁČOVÁ, Zdena - KENDERESSY, Pavol - HREŠKO, Juraj** - KUBINSKÝ, Daniel - DOBROVODSKÁ, Marta. Assessment of landscape retention water capacity and hydrological balance in traditional agricultural landscape (model area Liptovská Teplička settlements, Slovakia) [Hodnotenie kapacity zadržiavania vody a hydrologickej rovnováhy v tradičnej poľnohospodárskej krajine (modelová oblasť sídla Liptovská Teplička, Slovensko)]. In *Water*, 2020, vol. 12, iss. 12, article no. 3 591. (2019: 2.544 - IF, Q2 - JCR, 0.657 - SJR, Q1 - SJR). (2020 - Current Contents). ISSN 2073-4441. Available at: <https://doi.org/10.3390/w12123591> Type: ADCA
4. LACO, Ivan**. Assessment of the selected regulating ecosystem services using ecosystem services matrix in two model areas: Special nature reserve Obedska Bara /Serbia/ and protected landscape area Dunajske Luhy /Slovakia/ [Hodnotenie vybraných regulačných ekosystémových služieb využitím matice ekosystémových služieb v dvoch modelových územiach: PR Obedská Bara (Srbsko) a CHKO Dunajské Luhy (Slovensko)]. In *Land*, 2021, vol. 10, iss. 12, article no. 1 401. (2020: 3.398 - IF, Q2 - JCR, 0.744 - SJR, Q2 - SJR). (2021 - Current Contents). ISSN 2073-445X. Available at: <https://doi.org/10.3390/land10121401> Type: ADCA
5. IZAKOVIČOVÁ, Zita - MIKLÓS, László. Biodiversity protection of the forest ecosystems on the base of representative geoecosystems. In *Sustainable mountain regions: Challenges and perspectives in southeastern Europe*. - Cham : Springer, 2016, p. 151-158. ISBN 978-3-319-27903-9. Available at: https://doi.org/10.1007/978-3-319-27905-3_11 Type: ABC, 3 citations

6. IZAKOVIČOVÁ, Zita - MIKLÓS, László - MIKLÓSOVÁ, Viktória**. Integrative assessment of land use conflicts. In Sustainability, 2018, vol. 10, iss. 9, art. no. 3 270, p. 1-30. (2017: 2.075 - IF, Q2 - JCR, 0.537 - SJR, Q2 - SJR). (2018 - Current Contents). ISSN 2071-1050. Sustainable use of soils and water: The role of environmental land use conflicts, p. 293-322. (2017: 2.075 - IF, Q2 - JCR, 0.537 - SJR, Q2 - SJR). Available at: <https://doi.org/10.3390/su10093270> Type: ADCA, 11 citations
7. IZAKOVIČOVÁ, Zita - ŠPULEROVÁ, Jana** - PETROVIČ, František. Integrated approach to sustainable land use management. In Environments: Open Access Journal of Environmental Conservation and Technology , 2018, vol. 5, iss. 3, articl. no. 37. ISSN 2076-3298. Available at: <https://doi.org/10.3390/environments5030037> Type: ADMB, 7 citations
8. IZAKOVIČOVÁ, Zita - ŚWIĄDER, Małgorzata. Building ecological networks in Slovakia and Poland. In Ekológia (Bratislava) : international journal for ecological problems of the biosphere, 2017, vol. 36, no. 4, p. 303-322. (2016: 0.224 - SJR, Q3 - SJR). (2017 - Scopus). ISSN 1335-342X. Available at: <https://doi.org/10.1515/eko-2017-0025> Type: ADNB, 11 citations
9. PISCOVÁ, Veronika - HRNČIAROVÁ, Tatiana - HREŠKO, Juraj - DOBROVODSKÁ, Marta - IZAKOVIČOVÁ, Zita - IZSÓFF, Martin - KALIVODA, Henrik - KANKA, Róbert - KENDERESSY, Pavol - POVAŽAN, Radoslav - ROHÁČ, Ján - SLABEJOVÁ, Monika - SLIVINSKÝ, J. - ŠPULEROVÁ, Jana - ŠVAJDA, Juraj - TOPERCER, Ján - VLACHOVIČOVÁ, Miriam - BOROVSKÝ, Igor - HURTA, Vladimír. *Využívanie vysokohorskej krajiny a jeho dôsledky na zmenu prostredia (na príklade Tatier a Nízkych Tatier)* [Use of the alpine landscape and its impact on changes in the environment (case study of Tatras and Low Tatras)]. Bratislava: Veda, 2018. 250 p. Available online: <<https://veda.sav.sk/kniha/piscova-veronika-a-kolektiv-vyuzivanie-vysokohorskej-krajiny-a-jeho-dosledky-na-zmenu-prostredia-na-priklade-tatier-a-nizkych-tatier>>. ISBN 978-80-224-1585-9 Type: AAB, 1 citation
10. UJHÁZY, Karol - HRIVNÁK, Richard - KLIMENT, Ján - KOLLÁR, Jozef - NOVÁK, Pavel - MÁLIŠ, František - SLEZÁK, Michal - UJHÁZYOVÁ, Mariana. *Carpino-Fagetea sylvaticae*. In *Rastlinné spoločenstvá Slovenska : 6. Vegetácia lesov a krovín*. 1. vyd. - Bratislava: VEDA, 2021, p. 317-493. ISBN 978-80-224-1917-8. Available at: <<https://veda.sav.sk/kniha/valachovic-milan-kliment-jan-hegedusova-vantarova-katarina-rastlinne-spolocenstva-slovenska-6-vegetacia-lesov-a-krovin>> Type: ABB

2.1.6. List of patents, patent applications, and other intellectual property rights registered abroad, incl. revenues

-

2.1.7. List of patents, patent applications, and other intellectual property rights registered in Slovakia, incl. revenues

-

2.1.9. Narrative on the most important research outputs of the institute – especially focused on their importance for society (3-5 pages)

The Institute of Landscape Ecology of the Slovak Academy of Sciences (ILE SAS) performs complex landscape ecological research, based on a geosystem approach to landscape assessment. It focuses on research of all components of the landscape and their interconnections. It is often difficult to publish the results of such extensive, holistic research in individual journals, as many of them are topic-oriented or more-narrowly focused. Therefore, besides journal articles mostly focusing to particular themes, the monographs and chapters in monographs, published in prestigious international and domestic publishing houses, represent a noticeable part of the ILE SAS publications. The ILE SAS also carries out applied research that contributes to a policy design and management-planning processes, thus we publish the results of our research in the national language too. Local language is much more acceptable for these stakeholder groups and gives a chance to a faster and more precise transfer of the research results into real practice.

International research represents a significant part of ILE SAS's work and the ILE SAS is broadly involved in international projects and consortia. The methodologies developed by international research teams are usually tested in individual countries, aimed as project's case studies. The

synthesized results of such research are then published by larger group of scientists in the high-impact journals, including SCIENCE and NATURE. These publications are result of wide spectrum of long-lasting activities, including discussions and negotiations, which reflect the most important and actual environmental topics, such as climate change, degradation of natural capital and ecosystem services shrinkage.

The following five selected publications (ranked as top 5 publications in chapter 2.1.2.) represent our most important research outputs that are based on the main strategic research pillar described in chapter 1.8.

Accelerated increase in plant species richness on mountain summits is linked to warming.

The Article published in 2018 in *Nature* by the broad international team of authors, including our staff members Róbert Kanka and Veronika Piscová. It is the result of one of the main research activities of the Institute *Observing, monitoring and assessment of mountain flora affected by climate changes*. These activities were carried out within the follow-up activities of the project GLORIA (Global Observation and Research Initiative in Alpine Environments), which aims to create and maintain a monitoring network of research sites for long-term observation of mountain flora. Authors from the Institute belong to a broader scientific team, which since 2001 conducts research on permanent sites on the summits of the four Tatra peaks, Krížna (1,918.6 m a.s.l.), Veľká kopa (2,052.4 m a.s.l.), Sedielková kopa (2,061.3 m a.s.l.), and Krátka (2,374.5 m a.s.l.).

Abstract: Globally accelerating trends in societal development and human environmental impacts since the mid-twentieth century are known as the Great Acceleration and have been discussed as a key indicator of the onset of the Anthropocene epoch. While reports on ecological responses (for example, changes in species range or local extinctions) to the Great Acceleration are multiplying, it is unknown whether such biotic responses are undergoing a similar acceleration over time. This knowledge gap stems from the limited availability of time series data on biodiversity changes across large temporal and geographical extents. A dataset of repeated plant surveys from 302 mountain summits across Europe was used, spanning 145 years of observation, to assess the temporal trajectory of mountain biodiversity changes as a globally coherent imprint of the Anthropocene. The research showed that a continent-wide acceleration in the rate of increase in plant species richness, with five times as much species enrichment between 2007 and 2016 as fifty years ago, between 1957 and 1966. This acceleration is strikingly synchronized with accelerated global warming and is not linked to alternative global change drivers. The accelerating increases in species richness on mountain summits across this broad spatial extent demonstrate that acceleration in climate-induced biotic change is occurring even in remote places on Earth, with potentially far-ranging consequences not only for biodiversity, but also for ecosystem functioning and services.

Adoption of the ecosystem services concept in EU policies.

Another article in the broad international author collective, co-authored by Jana Špulerová and Peter Bezák, addresses the issue of how the EU and selected member states are implementing the concept of ecosystem services in their policy instruments. Article was published in *Ecosystem Services* in 2018. Detailed analysis of the EU and local policies shows to policy and decision-makers strong and weak points of the existing regulatory framework and provides opportunities for improvement of environment-related policies design across disciplines and scales.

Abstract: The concept of ecosystem services has gained a strong political profile during the last 15 years. However, there is no specific EU policy devoted to governing ecosystem services. This article shows that the ecosystem services concept is already embedded in recent EU (environmentally-related) policies, such as the Biodiversity Strategy 2020 and the Invasive Alien Species Regulation. Our review of 12 policies shows that, overall, the coherence between existing policies and the ecosystem services concept is moderate. Policies showing very high coherence are confined to the policy arenas that address natural ecosystems, forestry, or agriculture. Given the sectoral nature of most EU policies and the limited options for revision in the near future, opportunities for improving coherence are most apparent in furthering the integration of the ecosystem services concept in the implementation of existing EU policies at national and regional levels.

Institutional challenges in putting ecosystem service knowledge in practice.

An article was published in *Ecosystem Services* in 2017. The issue of *ecosystem services* has been addressed in the project OpenNESS (Operationalisation of Natural Capital and EcoSystem Services - From Concepts to Real-world Applications), a project of the 7th EU Framework Programme. Activities of ILE SAS included assessment of the actual state of implementation of the concept of natural capital and ecosystem services in the model area of Trnava, which was one of the case studies, localised in 16 countries of Europe and Latin America. Within the large research team of the project as well as in the international team of authors of the mentioned publication, Zita Izakovičová represented the Slovak case study. In Slovakia, the ecosystem service approach has the potential to widen the scope of traditional landscape-ecological planning to include ecosystem-based benefits, including social and economic benefits, for the whole society and thereby strengthen the role of landscape-ecological planning in urban and territorial planning.

Abstract: Published research analysed how knowledge on ecosystem services is actually used to inform land and water management in 22 case studies covering different social-ecological systems in European and Latin American countries. The promise that ecosystem service assessments will contribute to better decision-making is not yet proven. None of the case studies reported instrumental use of knowledge in a sense that ecosystem service knowledge would have served as an impartial arbiter between policy options. Yet, in most cases, there was some evidence of conceptual learning as a result of close interaction between researchers, practitioners and stakeholders. Several factors were observed that constrained knowledge uptake, including competing interests and political agendas, scientific disputes, professional norms and competencies, and lack of vertical and horizontal integration. Ecosystem knowledge played a small role particularly in those planning and policy-making situations where it challenged established interests and the current distribution of benefits from ecosystems. The factors that facilitated knowledge use included application of transparent participatory methods, social capital, policy champions and clear synergies between ecosystem services and human well-being. The results are aligned with previous studies which have emphasized the importance of building local capacity, ownership and trust for the long-term success of ecosystem service research.

Traditional agricultural landscapes (TAL) in Slovakia: why should we preserve them?

The article was published in 2017 in the journal *Landscape Research* by a team of authors consisting exclusively of researchers from our institute. The research was carried out within one of the pillars of the basic research *Research of landscape changes and changes of its ecosystems, land use change research and assessment of driving forces behind these changes*.

The continuation of the TAL research, which resulted in a concrete social impact and the collaboration with the Ministry of Agriculture and Rural Development on the inclusion of High Nature Value farmland HNV2 in the Agricultural Land Inventory System (LPIS) (more details in the chapter 2.6.).

Abstract: TAL in Slovakia have high biodiversity and cultural-historical values and benefits for human well-being. The presence of agrarian landforms significantly contributes to landscape diversity, provides biotopes of many plant and animal species, and represents traditional features of agricultural land. We believe that unique landscape structures unaffected by collectivisation and massive agricultural industrialisation should be maintained as the heritage of traditional agricultural management not only in Slovakia but all over Europe. Interest in traditional farming is decreasing, although many farmers and non-farmers wish to maintain traditional forms in the landscape. However, their motivation is not sufficiently complemented by financial feasibility. Current support through payments to less favoured areas or through agroenvironmental payments do not sufficiently offset the difficult conditions for TAL farming. Our research showed that difficulties in management of small-scale structures with specific agrarian landforms need to be taken into account in new measures supporting High Nature Value farmland (HNV2) type. As witnessed elsewhere in Europe, agro-environmental measures oriented towards landscape quality and small-scale farming would certainly facilitate maintenance and protection of TAL. These include support for multifunctional use of agricultural areas and development of the new instruments of farmland (HNV2) support mentioned above. Ensuring maintenance of TAL is a challenge that must especially be addressed by politicians and the planning focus groups who formulate rural development policy. In order to maintain the existing landscapes, a number of actions taken by local, national, and European authorities are needed. They include the appropriate assessment of

natural and cultural values, and their incorporation into feasible land management plans. These plans should also take into account the enhancement of the social and economic conditions of local populations. In essence, this is connected with the notion of 'sustainable development'. The preservation of culturally and environmentally friendly landscapes depends upon the availability of financial resources and local participation, making support for TAL as a type of HNV2 a natural fit for Rural Development Program (RDP) implementation.

Meta-analysis of multidecadal biodiversity trends in Europe

ILE SAS is a member of ILTER, global network performing *long-term ecological research* in a coordinated way, that contributes to the understanding of changes in ecosystems and their impact and links to the socio-economic sphere. One of the outputs of the global long-term ecosystem research is the article: Meta-analysis of multidecadal biodiversity trends in Europe, published in *Nature Communications* in 2020. Co-authors were also our researchers Ľuboš Halada and Henrik Kalivoda.

Abstract: Local biodiversity trends over time are likely to be decoupled from global trends, as local processes may compensate or counteract global change. Authors analysed 161 long-term biological time series (15–91 years) collected across Europe, using a comprehensive dataset comprising marine, freshwater and terrestrial taxa. The aims of the text were whether local long-term biodiversity trends are consistent among biogeoregions, realms and taxonomic groups, and whether changes in biodiversity correlate with regional climate and local conditions. Meta-analysis reveals that local trends of abundance, richness and diversity differ among biogeoregions, realms and taxonomic groups, demonstrating that biodiversity changes at local scale are often complex and cannot be easily generalized. However, an increase in richness and abundance with increasing temperature and naturalness was found, as well as a clear spatial pattern in changes in community composition (i.e. temporal taxonomic turnover) in most biogeoregions of Northern and Eastern Europe.

2.1.8. Table of research outputs

Papers from international collaborations in large-scale scientific projects (Dwarf team, ALICE Collaboration, ATLAS collaboration, CD Collaboration, H1 Collaboration, HADES Collaboration, and STAR Collaboration) have to be listed separately

Scientific publications	2016			2017			2018			2019			2020			2021			total			
	number	No. / FTE researches	No. / one million total salary budget	number	No. / FTE researches	No. / one million total salary budget	number	No. / FTE researches	No. / one million total salary budget	number	No. / FTE researches	No. / one million total salary budget	number	No. / FTE researches	No. / one million total salary budget	number	No. / FTE researches	No. / one million total salary budget	number	averaged number per year	av. No. / FTE researches	av. No. / one million total salary budget
Scientific monographs and monographic studies in journals and proceedings published abroad (AAA, ABA)	0	0,000	0,000	0	0,000	0,000	2	0,063	1,916	1	0,032	0,941	1	0,031	0,814	0	0,000	0,000	4	0,667	0,021	0,596
Scientific monographs and monographic studies in journals and proceedings published in Slovakia (AAB, ABB)	0	0,000	0,000	3	0,095	2,868	2	0,063	1,916	1	0,032	0,941	4	0,125	3,255	2	0,065	1,420	12	2,000	0,063	1,789
Chapters in scientific monographs published abroad (ABC)	4	0,116	4,367	1	0,032	0,956	1	0,032	0,958	0	0,000	0,000	3	0,093	2,441	0	0,000	0,000	9	1,500	0,047	1,342
Chapters in scientific monographs published in Slovakia (ABD)	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	0,000
Scientific papers published in journals registered in Current Contents Connect (ADCA, ADCB, ADDA, ADEB)	6	0,174	6,550	17	0,539	16,252	17	0,539	16,284	13	0,417	12,230	27	0,841	21,969	27	0,884	19,176	107	17,833	0,560	15,956
Scientific papers published in journals registered in Web of Science Core Collection and SCOPUS not listed above (ADMA, ADMB, ADNA, ADNBN)	14	0,407	15,284	15	0,476	14,340	15	0,476	14,368	5	0,161	4,704	6	0,187	4,882	11	0,360	7,813	66	11,000	0,345	9,842
Scientific papers published in other foreign journals (not listed above) (ADEA, ADEB)	0	0,000	0,000	4	0,127	3,824	0	0,000	0,000	0	0,000	0,000	0	0,000	0,000	3	0,098	2,131	7	1,167	0,037	1,044
Scientific papers published in other domestic journals (not listed above) (ADFA, ADFB)	20	0,581	21,834	15	0,476	14,340	17	0,539	16,284	21	0,674	19,755	24	0,748	19,528	9	0,295	6,392	106	17,667	0,554	15,807
Scientific papers published in foreign peer-reviewed proceedings (AECA)	0	0,000	0,000	0	0,000	0,000	1	0,032	0,958	1	0,032	0,941	2	0,062	1,627	1	0,033	0,710	5	0,833	0,026	0,746
Scientific papers published in domestic peer-reviewed proceedings (AEDA)	0	0,000	0,000	0	0,000	0,000	1	0,032	0,958	1	0,032	0,941	2	0,062	1,627	2	0,065	1,420	6	1,000	0,031	0,895
Published papers (full text) from foreign scientific conferences (AFA, AFC)	1	0,029	1,092	1	0,032	0,956	1	0,032	0,958	3	0,096	2,822	0	0,000	0,000	0	0,000	0,000	6	1,000	0,031	0,895
Published papers (full text) from domestic scientific conferences (AFB, AFD)	3	0,087	3,275	0	0,000	0,000	1	0,032	0,958	1	0,032	0,941	3	0,093	2,441	2	0	1	10	2	0	1

2.2. Measures of research outputs (citations, etc.)

2.2.1. Table with citations per annum (without self-citations)

Citations of papers from international collaborations in large-scale scientific projects (Dwarf team, ALICE Collaboration, ATLAS collaboration, CD Collaboration, H1 Collaboration, HADES Collaboration, and STAR Collaboration) are listed separately

Citations, reviews	2015		2016		2017		2018		2019		2020		total		
	number	No. / FTE researchers	number	No. / FTE researchers	number	No. / FTE researchers	number	No. / FTE researchers	number	No. / FTE researchers	number	No. / FTE researchers	number	averaged number per year	av. No. / FTE researchers
Citations in Web of Science Core Collection (1.1, 2.1)	439	12,75	498	15,80	628	19,92	829	26,62	897	27,95	1 007	32,97	4 298	716,33	22,47
Citations in SCOPUS (1.2, 2.2) if not listed above	142	4,12	103	3,27	120	3,81	135	4,34	94	2,93	104	3,41	698	116,33	3,65
Citations in other citation indexes and databases (not listed above) (3.2,4.2)	80	2,32	2	0,06	2	0,06	0	0,00	0	0,00	1	0,03	85	14,17	0,44
Other citations (not listed above) (3.1, 4.1)	0	0,00	54	1,71	86	2,73	63	2,02	42	1,31	14	0,46	259	43,17	1,35
Reviews (5,6)	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0	0,00	0,00

2.2.2. List of 10 most-cited publications published any time with the address of the institute, with number of citations in the assessment period (2015 – 2020)

1. ADCB GOTTFRIED, Michael - PAULI, Harald** - FUTSCHIK, Andreas - AKHALKATSI, Maia - BARANČOK, Peter - ALONSO, José Luis Benito - COLDEA, Gheorghe - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - KAZAKIS, George - KRAJČÍ, Ján - LARSSON, Per - MALLAUN, Martin - MICHELSEN, Ottar - MOISEEV, Dmitry - MOISEEV, Pavel - MOLAU, Ulf - MERZOUKI, Abderrahmane - NAGY, Laszlo - NAKHUTSRISHVILI, George - PEDERSEN, Bard - PELINO, Giovanni - PUSCAS, Mihai - ROSSI, Graziano - STANISCI, Angela - THEURILLAT, Jean-Paul - TOMASELLI, Marcello - VILLAR, Luis - VITTOZ, Pascal - VOGIATZAKIS, Ioannis - GRABHERR, Georg. Continent-wide response of mountain vegetation to climate change. In *Nature climate change*, 2012, no. 2, p. 1-31. (2012 - Current Contents Connect). ISSN 1758-678X. Available at: <https://doi.org/10.1038/nclimate1329> - 417 citations
2. ADCA PAILLET, Yoan - BERGÉS, Laurent** - HJÄLTÉN, Joakim - ÓDOR, Péter - AVON, Catherine - BERNHARDT-RÖMERMANN, Markus - BIJLSMA, Rienk-Jan - BRUYN, Luc de - FUHR, Marc - GRANDIN, Ulf - KANKA, Róbert - LUNDIN, Lars - LUQUE, Sandra - MAGURA, Tibor - MATESANZ, Silvia - MÉSZÁROS, Ilona - SEBASTIA, M. Teresa - SCHMIDT, Wolfgang - STANDOVÁR, Tibor - TÓTHMÉRÉSZ, Béla - UOTILA, Anneli - VALLADARES, Fernando - VELLAK, Kai - VIRTANEN, Risto. Biodiversity differences between managed and unmanaged forests: meta-analysis of species richness in Europe. In *Conservation Biology*, 2010, vol. 24, iss. 1, p. 101-112. (2009: 4.666 - IF, 3.237 - SJR, Q1 - SJR, Current Contents - CCC). (2010 - Current Contents). ISSN 0888-8892. Available at: <https://doi.org/10.1111/j.1523-1739.2009.01399.x> - 326 citations
3. ADCA PAULI, Harald* - GOTTFRIED, Michael** - DULLINGER, Stefan* - ABDALADZE, Otari - AKHALKATSI, Maia - ALONSO, José Luis Benito - COLDEA, Gheorghe - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - GHOSN, Dany - HOLTEN, Jarle I. - KANKA, Róbert - KAZAKIS, George - KOLLÁR, Jozef - LARSSON, Per - MOISEEV, Pavel - MOISEEV, Dmitry - MOLAU, Ulf - MESA, Joaquín Molero - NAGY, Laszlo - PELINO, Giovanni - PUSCAS, Mihai - ROSSI, Graziano - STANISCI, Angela - SYVERHUSET, Anne O. - THEURILLAT, Jean-Paul - TOMASELLI, Marcello - UNTERLUGGAUER, Peter - VILLAR, Luis - VITTOZ, Pascal - GRABHERR, Georg. Recent plant diversity changes on Europe's mountain summits. In *Science*, 2012, vol. 336, p. 353-355. (2011: 31.201 - IF, Q1 - JCR, 14.238 - SJR, Q1 - SJR, Current Contents - CCC). (2012 - Current Contents). ISSN 0036-8075. Available at: <https://doi.org/10.1126/science.1219033> - 300 citations
4. ADCA LIESKOVSKÝ, Juraj** - KENDERESSY, Pavol. Modelling the effect of vegetation cover and different tillage practises on soil erosion in vineyards: a case study in Vráble (Slovakia) using Watem/Sedem. In *Land Degradation & Development*, 2014, vol. 25, p. 288-296. (2013: 2.058 - IF, Q2 - JCR, 0.852 - SJR, Current Contents - CCC). (2014 - Current Contents). ISSN 1085-3278. Available at: <https://doi.org/10.1002/ldr.2162> - 162 citations
5. ADEB BOWMAN, William D. - CLEVELAND, Cory C. - HALADA, Ľuboš - HREŠKO, Juraj - BARON, Jill S. Negative impact of nitrogen deposition on soil buffering capacity. In *Nature geoscience*, 2008, vol. 1, no. 11, p. 767-770. ISSN 1752-0894. Available at: <https://doi.org/10.1038/ngeo339> - 155 citations
6. ADCA STEINBAUER, Manuel J.** - GRYTNES, John-Arvid - JURASINSKI, Gerald - KULONEN, Aino - LENOIR, Jonathan - PAULI, Harald - RIXEN, Christian - WINKLER, Manuela - BARDY-DURCHHALTER, Manfred - BARNI, Elena - BJORKMAN, Anne D. - BREINER, Frank - BURG, Sarah - CZORTEK, Patryk - DAWES, Melissa A. - DELIMAT, Anna - DULLINGER, Stefan - ERSCHBAMER, Brigitta - FELDE, Vivian A. - FERNÁNDEZ-ARBERAS, Olatz - FOSSHEIM, Kjetil F. - GÓMEZ-GARCÍA, Daniel - GEORGES, Damien - GRINDRUD, Erlend T. - HAIDER, Sylvia - HAUGUM, Siri V. - HENRIKSEN, Hanne - HERREROS, María J. -

- JAROSZEWICZ, Bogdan - JAROSZYNSKA, Francesca - KANKA, Róbert - KAPFER, Jutta - KLANDERUD, Kari - KÜHN, Ingolf - LAMPRECHT, Andrea - MATTEODO, Magali - MORRA DI CELLA, Umberto - NORMAND, Signe - ODLAND, Arvid - OLSEN, Siri L. - PALACIO, Sara - PETEY, Martina - PISCOVÁ, Veronika - SEDLÁKOVÁ, Blažena - STEINBAUER, Klaus - STÖCKLI, Veronika - SVENNING, Jens-Christian - TEPPA, Guido - THEURILLAT, Jean-Paul - VITTOZ, Pascal - WOODIN, Sarah J. - ZIMMERMANN, Niklaus E. - WIPF, Sonja**. Accelerated increase in plant species richness on mountain summits is linked to warming. In *Nature*, 2018, vol. 556, no. 7 700, p. 231-234. (2017: 41.577 - IF, Q1 - JCR, 17.875 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0028-0836. Available at: <https://doi.org/10.1038/s41586-018-0005-6> - 142 citations
7. ADCA GRIFFITHS, Patrick** - KUEMMERLE, Tobias - BAUMANN, Matthias - RADELOFF, Volker C. - ABRUDAN, Ioan V. - LIESKOVSKÝ, Juraj - MUNTEANU, Catalina - OSTAPOWICZ, Katarzyna - HOSTERT, Patrick. Forest disturbances, forest recovery and changes in forest types across the Carpathian ecoregion from 1985 to 2010 based on Landsat image composites. In *Remote Sensing of Environment*, 2014, vol. 151, p. 72-88. (2013: 4.769 - IF, Q1 - JCR, 3.250 - SJR). (2014 - Current Contents). ISSN 0034-4257. Available at: <https://doi.org/10.1016/j.rse.2013.04.022> - 134 citations
 8. ADCA MUNTEANU, Catalina** - KUEMMERLE, Tobias - BOLTÍŽIAR, Martin - BUTSIC, Van - GIMMI, Urs - HALADA, Ľuboš - KAIM, Dominik - KIRALY, Geza - KONKOLY-GYURÓ, Eva - KOZAK, Jacek - LIESKOVSKÝ, Juraj - MOJSES, Matej - MÜLLER, Daniel - OSTAFIN, Krzysztof - OSTAPOWICZ, Katarzyna - SHANDRA, Oleksandra - STYCH, Premysl - WALKER, Sarah - RADELOFF, Volker C. Forest and agricultural land change in the Carpathian region - A meta-analysis of long-term patterns and drivers of change. In *Land Use Policy : The International Journal Covering All Aspects of Land Use*, 2014, vol. 38, p. 685-697. (2013: 3.134 - IF, Q1 - JCR, 1.490 - SJR). (2014 - Current Contents). ISSN 0264-8377. Available at: <https://doi.org/10.1016/j.landusepol.2014.01.012> - 133 citations
 9. ADCA HALADA, Ľuboš** - EVANS, Doug - ROMAO, Carlos - PETERSEN, Jan-Erik. Which habitats of European importance depend on agricultural practices? In *Biodiversity and conservation*, 2011, vol. 20, no. 11, p. 2 365-2 378. (2010: 2.146 - IF, Q2 - JCR, 1.099 - SJR, Q1 - SJR). (2011 - Current Contents). ISSN 0960-3115. Available at: <https://doi.org/10.1007/s10531-011-9989-z> - 133 citations
 10. ADCA MEDVECKÁ, Jana - KLIMENT, Ján - MÁJEKOVÁ, Jana - HALADA, Ľuboš - ZALIBEROVÁ, Mária - GOJDIČOVÁ, Ema - FERÁKOVÁ, Viera - JAROLÍMEK, Ivan. Inventory of the alien flora of Slovakia = Přehled nepůvodní flóry Slovenska. In *Preslia : časopis České botanické společnosti*, 2012, vol. 84, no. 2, p. 257-309. (2011: 2.521 - IF, Q2 - JCR, 1.476 - SJR, Q1 - SJR). (2012 - Current Contents). ISSN 0032-7786 - 125 citations
 11. ADCA JEPSEN, Martin Rudbeck - KUEMMERLE, Tobias - MÜLLER, Daniel - ERB, Karlheinz - VERBURG, Peter H. - HABERL, Helmut - VESTERAGER, Jens Peter - ANDRIČ, Maja - ANTROP, Marc - AUSTRHEIM, Gunnar - BJÖRN, Ismo - BONDEAU, Alberte - BÜRGI, Matthias - BRYSON, Jessica - CASPAR, Gilles - CASSAR, Louis-Francis - CONRAD, Elizabeth - CHROMÝ, Pavel - DAUGIRDAS, Vidmantas - VAN EETVELDE, Veerle - ELENA-ROSSELLÓ, Ramon - GIMMI, Urs - IZAKOVIČOVÁ, Zita - JANČÁK, Vít - JANSSON, Ulf - KLADNIK, Drago - KOZAK, Jacek - KONKOLY-GYURÓ, Eva - KRAUSMANN, Fridolin - MANDER, Ülo - MCDONAGH, John - PÄRN, Jaan - NIEDERTSCHEIDER, Maria - NIKODEMUS, Olgerts - OSTAPOWICZ, Katarzyna - PÉREZ-SOBA, Marta - PINTO-CORREIA, Teresa - RIBOKAS, Gintaras - ROUNSEVELL, Mark - SCHISTOU, Despoina - SCHMIT, Claude - TERKENLI, Theano S. - TRETVIK, Aud M. - TRZEPACZ, Piotr - VADINEANU, Angheluta - WALZ, Ariane - ZHLLIMA, Edwin - REENBERG, Anette. Transitions in European land-management regimes between 1800 and 2010. In *Land Use Policy : The International Journal Covering All Aspects of Land Use*, 2015, vol. 49, p. 53-64. (2014: 2.631 - IF, Q1 - JCR, 1.491 - SJR, Q1 - SJR). (2015 - Current Contents). ISSN 0264-8377. Available at: <https://doi.org/10.1016/j.landusepol.2015.07.003> - 107 citations

2.2.3. List of 10 most-cited publications published any time with the address of the institute, with number of citations obtained until 2020

1. ADCB - GOTTFRIED, Michael - PAULI, Harald** - FUTSCHIK, Andreas - AKHALKATSI, Maia - BARANČOK, Peter - ALONSO, José Luis Benito - COLDEA, Gheorghe - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - KAZAKIS, George - KRAJČÍ, Ján - LARSSON, Per - MALLAUN, Martin - MICHELSEN, Ottar - MOISEEV, Dmitry - MOISEEV, Pavel - MOLAU, Ulf - MERZOUKI, Abderrahmane - NAGY, Laszlo - NAKHUTSRISHVILI, George - PEDERSEN, Bard - PELINO, Giovanni - PUSCAS, Mihai - ROSSI, Graziano - STANISCI, Angela - THEURILLAT, Jean-Paul - TOMASELLI, Marcello - VILLAR, Luis - VITTOZ, Pascal - VOGIATZAKIS, Ioannis - GRABHERR, Georg. Continent-wide response of mountain vegetation to climate change. In *Nature climate change*, 2012, no. 2, p. 1-31. (2012 - Current Contents Connect). ISSN 1758-678X. Available at: <https://doi.org/10.1038/nclimate1329> - 528 citations
2. ADCA - PAILLET, Yoan - BERGÉS, Laurent** - HJÄLTÉN, Joakim - ÓDOR, Péter - AVON, Catherine - BERNHARDT-RÖMERMAN, Markus - BIJLSMA, Rienk-Jan - BRUYN, Luc de - FUHR, Marc - GRANDIN, Ulf - KANKA, Róbert - LUNDIN, Lars - LUQUE, Sandra - MAGURA, Tibor - MATESANZ, Silvia - MÉSZÁROS, Ilona - SEBASTIA, M. Teresa - SCHMIDT, Wolfgang - STANDOVÁR, Tibor - TÓTHMÉRÉSZ, Béla - UOTILA, Anneli - VALLADARES, Fernando - VELLAK, Kai - VIRTANEN, Risto. Biodiversity differences between managed and unmanaged forests: meta-analysis of species richness in Europe. In *Conservation Biology*, 2010, vol. 24, iss. 1, p. 101-112. (2009: 4.666 - IF, 3.237 - SJR, Q1 - SJR, Current Contents - CCC). (2010 - Current Contents). ISSN 0888-8892. Available at: <https://doi.org/10.1111/j.1523-1739.2009.01399.x> - 443 citations
3. ADCA - PAULI, Harald* - GOTTFRIED, Michael** - DULLINGER, Stefan* - ABDALADZE, Otari - AKHALKATSI, Maia - ALONSO, José Luis Benito - COLDEA, Gheorghe - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - GHOSN, Dany - HOLTEN, Jarle I. - KANKA, Róbert - KAZAKIS, George - KOLLÁR, Jozef - LARSSON, Per - MOISEEV, Pavel - MOISEEV, Dmitry - MOLAU, Ulf - MESA, Joaquín Molero - NAGY, Laszlo - PELINO, Giovanni - PUSCAS, Mihai - ROSSI, Graziano - STANISCI, Angela - SYVERHUSE, Anne O. - THEURILLAT, Jean-Paul - TOMASELLI, Marcello - UNTERLUGGAUER, Peter - VILLAR, Luis - VITTOZ, Pascal - GRABHERR, Georg. Recent plant diversity changes on Europe's mountain summits. In *Science*, 2012, vol. 336, p. 353-355. (2011: 31.201 - IF, Q1 - JCR, 14.238 - SJR, Q1 - SJR, Current Contents - CCC). (2012 - Current Contents). ISSN 0036-8075. Available at: <https://doi.org/10.1126/science.1219033> - 393 citations
4. ADEB - BOWMAN, William D. - CLEVELAND, Cory C. - HALADA, Ľuboš - HREŠKO, Juraj - BARON, Jill S. Negative impact of nitrogen deposition on soil buffering capacity. In *Nature geoscience*, 2008, vol. 1, no. 11, p. 767-770. ISSN 1752-0894. Available at: <https://doi.org/10.1038/ngeo339> - 209 citations
5. ADDA - RUŽIČKA, Milan - MIKLÓS, László. Landscape-ecological planning (LANDEP) in the process of territorial planning. In *Ekológia (ČSSR): časopis pre ekologické problémy biosféry*, 1982, vol.1, no. 3, p. 297-312. ISSN 1335-342X - 173 citations
6. ADCA - MEDVECKÁ, Jana - KLIMENT, Ján - MÁJEKOVÁ, Jana - HALADA, Ľuboš - ZALIBEROVÁ, Mária - GOJDIČOVÁ, Ema - FERÁKOVÁ, Viera - JAROLÍMEK, Ivan. Inventory of the alien flora of Slovakia = Přehled nepůvodní flóry Slovenska. In *Preslia : časopis České botanické společnosti*, 2012, vol. 84, no. 2, p. 257-309. (2011: 2.521 - IF, Q2 - JCR, 1.476 - SJR, Q1 - SJR, Current Contents - CCC). (2012 - Current Contents). ISSN 0032-7786 - 170 citations
7. ADCA - LIESKOVSKÝ, Juraj** - KENDERESSY, Pavol. Modelling the effect of vegetation cover and different tillage practises on soil erosion in vineyards: a case study in Vráble (Slovakia) using Watem/Sedem. In *Land Degradation & Development*, 2014, vol. 25, p. 288-296. (2013: 2.058 - IF, Q2 - JCR, 0.852 - SJR, Current Contents - CCC). (2014 - Current Contents). ISSN 1085-3278. Available at: <https://doi.org/10.1002/ldr.2162> - 166 citations
8. ADCA - HALADA, Ľuboš** - EVANS, Doug - ROMAO, Carlos - PETERSEN, Jan-Erik. Which habitats of European importance depend on agricultural practices? In *Biodiversity and conservation*, 2011, vol. 20, no. 11, p. 2 365-2 378. (2010: 2.146 - IF, Q2 - JCR, 1.099 - SJR,

Q1 - SJR, Current Contents - CCC). (2011 - Current Contents). ISSN 0960-3115. Available at: <https://doi.org/10.1007/s10531-011-9989-z> - 162 citations

9. ADCA - STEINBAUER, Manuel J.** - GRYTNES, John-Arvid - JURASINSKI, Gerald - KULONEN, Aino - LENOIR, Jonathan - PAULI, Harald - RIXEN, Christian - WINKLER, Manuela - BARDY-DURCHHALTER, Manfred - BARNI, Elena - BJORKMAN, Anne D. - BREINER, Frank - BURG, Sarah - CZORTEK, Patryk - DAWES, Melissa A. - DELIMAT, Anna - DULLINGER, Stefan - ERSCHBAMER, Brigitta - FELDE, Vivian A. - FERNÁNDEZ-ARBERAS, Olatz - FOSSHEIM, Kjetil F. - GÓMEZ-GARCÍA, Daniel - GEORGES, Damien - GRINDRUD, Erlend T. - HAIDER, Sylvia - HAUGUM, Siri V. - HENRIKSEN, Hanne - HERREROS, María J. - JAROSZEWICZ, Bogdan - JAROSZYNSKA, Francesca - KANKA, Róbert - KAPFER, Jutta - KLANDERUD, Kari - KÜHN, Ingolf - LAMPRECHT, Andrea - MATTEODO, Magali - MORRA DI CELLA, Umberto - NORMAND, Signe - ODLAND, Arvid - OLSEN, Siri L. - PALACIO, Sara - PETEY, Martina - PISCOVÁ, Veronika - SEDLÁKOVÁ, Blažena - STEINBAUER, Klaus - STÖCKLI, Veronika - SVENNING, Jens-Christian - TEPPA, Guido - THEURILLAT, Jean-Paul - VITTOZ, Pascal - WOODIN, Sarah J. - ZIMMERMANN, Niklaus E. - WIPF, Sonja**. Accelerated increase in plant species richness on mountain summits is linked to warming. In *Nature*, 2018, vol. 556, no. 7 700, p. 231-234. (2017: 41.577 - IF, Q1 - JCR, 17.875 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0028-0836. Available at: <https://doi.org/10.1038/s41586-018-0005-6> - 142 citations
10. ADCA - HARMENS, H. - NORRIS, David A. - STEINNES, Eiliv - KUBIN, Eero - PIISPANEN, Juha - ALBER, Renate - ALEKSIAYENAK, Y. V. - BLUM, Oleg - COŞKUN, Mahmut - DAM, M. - DE TEMMERMAN, Ludwig - FERNÁNDEZ, J. A. - FROLOVA, Marina - FRONTASYEVA, M. - GONZÁLEZ-MIQUEO, Laura - GRODZINSKA, K. - JERAN, Zvonka - KORZEKWA, Szymon - KRMAR, M. - KVIETKUS, Kestutis - LEBLOND, Sébastien - LIIV, Siiri - MAGNÚSSON, S. H. - MAŇKOVSKÁ, Blanka - PESCH, Roland - RÜHLING, Ake - SANTAMARIA, J. M. - SCHRÖDER, Winfried - SPIRIC, Zdenko - SUCHARA, I. - THÖNI, Lotti - URUMOV, V. - YURUKOVA, Lilyana - ZECHMEISTER, Harald G. Mosses as biomonitors of atmospheric heavy metal deposition: Spatial patterns and temporal trends in Europe. In *Environmental Pollution*, 2010, vol. 158, no. 10, p. 3144-3156. (2009: 3.426 - IF, 2.002 - SJR, Q1 - SJR, Current Contents - CCC). (2010 - Current Contents). ISSN 0269-7491. Available at: <https://doi.org/10.1016/j.envpol.2010.06.039> - 139 citations

2.2.4. List of 10 most-cited publications published during the evaluation period (2016-2021) with the address of the Institute, with number of citations obtained until 2021

1. ADCA - STEINBAUER, Manuel J.** - GRYTNES, John-Arvid - JURASINSKI, Gerald - KULONEN, Aino - LENOIR, Jonathan - PAULI, Harald - RIXEN, Christian - WINKLER, Manuela - BARDY-DURCHHALTER, Manfred - BARNI, Elena - BJORKMAN, Anne D. - BREINER, Frank - BURG, Sarah - CZORTEK, Patryk - DAWES, Melissa A. - DELIMAT, Anna - DULLINGER, Stefan - ERSCHBAMER, Brigitta - FELDE, Vivian A. - FERNÁNDEZ-ARBERAS, Olatz - FOSSHEIM, Kjetil F. - GÓMEZ-GARCÍA, Daniel - GEORGES, Damien - GRINDRUD, Erlend T. - HAIDER, Sylvia - HAUGUM, Siri V. - HENRIKSEN, Hanne - HERREROS, María J. - JAROSZEWICZ, Bogdan - JAROSZYNSKA, Francesca - KANKA, Róbert - KAPFER, Jutta - KLANDERUD, Kari - KÜHN, Ingolf - LAMPRECHT, Andrea - MATTEODO, Magali - MORRA DI CELLA, Umberto - NORMAND, Signe - ODLAND, Arvid - OLSEN, Siri L. - PALACIO, Sara - PETEY, Martina - PISCOVÁ, Veronika - SEDLÁKOVÁ, Blažena - STEINBAUER, Klaus - STÖCKLI, Veronika - SVENNING, Jens-Christian - TEPPA, Guido - THEURILLAT, Jean-Paul - VITTOZ, Pascal - WOODIN, Sarah J. - ZIMMERMANN, Niklaus E. - WIPF, Sonja**. Accelerated increase in plant species richness on mountain summits is linked to warming. In *Nature*, 2018, vol. 556, no. 7 700, p. 231-234. (2017: 41.577 - IF, Q1 - JCR, 17.875 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0028-0836. Available at: <https://doi.org/10.1038/s41586-018-0005-6> - 142 citations
2. ADCA - DJUKIC, Ika** - KEPFER-ROJAS, Sebastian - SCHMIDT, Inger Kappel - LARSEN, Klaus Steenberg - BEIER, Claus - BERG, B. - VERHEYEN, Egon - MIHÁL, Ivan - BOROVSKÁ, Jana - GERHÁTOVÁ, Katarína - BARNA, Milan - KANKA, Róbert - PISCOVÁ, Veronika - CALIMAN, Adriano - PAQUETTE, Alain - GUTIÉRREZ-GIRÓN, Alba - HUMBER, Alberto -

VALDECANTOS, Alejandro - PETRAGLIA, Alessandro - ALEXANDER, Heather - AUGUSTAITIS, Algirdas - SAILLARD, Amélie - RUIZ FERNÁNDEZ, Ana Carolina - SOUSA, Ana I. - LILLEBO, Ana I. - DA ROCHA GRIPP, Anderson - FRANCEZ, André-Jean - FISCHER, Andrea - BOHNER, Andreas - MALYSHEV, Andrey - ANDRIĆ, Andrijana - SMITH, Andy - STANISCI, Angela - SERES, Anikó - SCHMIDT, Anja - AVILA, Anna - PROBST, Anne - OUIN, Annie - KHUROO, Anzar A. - VERSTRAETEN, Arne - PALABRAL-AGUILERA, Arely N. - STEFANSKI, Artur - GAXIOLA, Aurora - MUYS, Bart - BOSMAN, Bernard - AHRENDTS, Bernd - PARKER, Bill - SATTTLER, Birgit - YANG, Bo - JURÁNI, Bohdan - ERSCHBAMER, Brigitta - RODRIGUEZ ORTIZ, Carmen Eugenia - CHRISTIANSEN, Casper T. - ADAIR, E. Carol - MEREDIEU, Céline - MONY, Cendrine - NOCK, Charles A. - CHEN, Chi-Ling - WANG, Chiao-Ping - BAUM, Christel - RIXEN, Christian - DELIRE, Christine - PISCART, Christophe - ANDREWS, Christopher - REBMANN, Corinna - BRANQUINHO, Cristina - POLYANSKAYA, Dana - DELGADO, David Fuentes - WUNDRAM, Dirk - RADEIDEH, Diyaa - ORDÓÑEZ-REGIL, Eduardo - CRAWFORD, Edward - PREDA, Elena - TROPINA, Elena - GRONER, Elli - LUCOT, Eric - HORNUNG, Erzsébet - GACIA, Esperança - LÉVESQUE, Esther - BENEDITO, Evanilde - DAVYDOV, Evgeny A. - AMPOORTER, Evy - BOLZAN, Fabio Padilha - VARELA, Felipe - KRISTÖFEL, Ferdinand - MAESTRE, Fernando T. - MAUNOURY-DANGER, Florence - HOFHANS, Florian - KITZ, Florian - SUTTER, Flurin - CUESTA, Francisco - DE ALMEIDA LOBO, Francisco - DE SOUZA, Franco Leandro - BERNINGER, Frank - ZEHETNER, Franz - WOHLFAHRT, Georg - VOURLITIS, George - CARREÑO-ROCABADO, Geovana - ARENA, Gina - PINHA, Gisele Daiane - GONZÁLEZ, Grizelle - CANUT, Guylaine - LEE, H. - VERBEECK, Hans - AUGÉ, Harald - PAULI, Harald - NACRO, Hassan Bismarck - BAHAMONDE, Héctor A. - FELDHAAR, Heike - JÄGER, Heinke - SERRANO, Helena C. - VERHEYDEN, Hélène - BRUELHEIDE, Helge - MEESENBURG, Henning - JUNGKUNST, Hermann - JACTEL, Hervé - SHIBATA, Hideaki - KUOKAWA, Hiroko - ROSAS, Hugo López - VILLALOBOS, Hugo L. Rojas - YESILONIS, Ian - MELECE, Inara - VAN HALDER, Inge - QUIRÓS, Inmaculada García - MAKELELE, Isaac - SENOU, Issaka - FEKETE, István - OSTONEN, Ivika - ROALES, Javier - SHOQEIR, Jawad - LATA, Jean-Christophe - THEURILLAT, Jean-Paul - PROBST, Jean-Luc - ZIMMERMAN, Jess - VIJAYANATHAN, Jeyanny - TANG, Jianwu - THOMPSON, Jill - DOLEŽAL, Jiří - SANCHEZ-CABEZA, Joan-Albert - MERLET, Joël - HENSCHER, Joh - NEIRYNCK, Johan - KNOPS, Johannes - LOEHR, John - VON OPPEN, Jonathan - PORLÁKSDÓTTIR, Jónína Sigríður - LÖFFLER, Jörg - CARDOSO-MOHEDANO, José-Gilberto - ALONSO, José Luis Benito - TOREZAN, Jose Marcelo - MORINA, Joseph C. - JIMÉNEZ, Juan J. - QUINDE, Juan Dario - ALATALO, Juha - SEEGER, Julia - STADLER, J. - KRIISKA, Kaie - COULIBALY, Kalifa - FUKUZAWA, Karibu - SZLAVECZ, Katalin - LAJTHA, Kate - KÄPPELER, Kathrin - JENNINGS, Katie A. - TIELBÖRGER, Katja - HOSHIZAKI, Kazuhiko - GREEN, Ken - YÉ, Lambiénou - RIBEIRO PAZIANOTO, Laryssa Helena - DIENSTBACH, Laura - WILLIAMS, Laura - YAHDJIAN, Laura. Early stage litter decomposition across biomes. In *Science of the Total Environment*, 2018, vol. 628-629, p. 1369-1394. (2017: 4.610 - IF, Q1 - JCR, 1.546 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 0048-9697. Available at: <https://doi.org/10.1016/j.scitotenv.2018.01.012> - 72 citations

3. ADCA - BOUWMA, I.** - SCHLEYER, Christian - PRIMMER, Eeva - WINKLER, Klara Johanna - BERRY, Pam - YOUNG, Juliette - CARMEN, Esther - ŠPULEROVÁ, Jana - BEZÁK, Peter - PREDA, Elena - VADINEANU, Angheluta. Adoption of the ecosystem services concept in EU policies. In *Ecosystem Services*, 2018, vol. 29, p. 213-222. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.02.014> - 71 citations
4. ADCA - SAARIKOSKI, Heli** - PRIMMER, Eeva - SAARELA, Sanna-Riikka - ANTUNES, Paula - ASZALÓS, Réka - BARÓ, Francisc - BERRY, Pam - BLANCO, Gemma Garcia - GÓMEZ-BAGGETHUN, Erik - CARVALHO, Laurence - DICK, Jan - DUNFORD, Rob - HANZU, Mihail - HARRISON, Paula - IZAKOVIČOVÁ, Zita - KERTÉSZ, Miklós - KOPPEROINEN, Leena - KÖHLER, Berit - LANGEMEYER, Johannes - LAPOLA, David Montenegro - LIQUETE, Camino - LUQUE, Sandra - MEDERLY, Peter - NIEMELÄ, Jari - PALOMO, Ignacio - PASTUR, Guillermo Martínez - PERI, Pablo Luis - PREDA, Elena - PRIESS, Joerg A. - SANTOS, Rui - SCHLEYER, Christian - TURKELBOOM, Francis - VADINEANU, Angheluta - VERHEYDEN, Wim - VIKSTRÖM, Suvi - YOUNG, Juliette. Institutional challenges in putting ecosystem

service knowledge in practice. In *Ecosystem Services*, 2018, vol. 29, p. 579-598. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.07.019> - 44 citations

5. ADCA - TIESKENS, Koen F. - SCHULP, Catharina J. E. - LEVERS, Christian - LIESKOVSKÝ, Juraj - KUEMMERLE, Tobias - PLIENINGER, Tobias - VERBURG, Peter H. Characterizing structure, management intensity and value of agricultural and forest landscapes. In *Land Use Policy : The International Journal Covering All Aspects of Land Use*, 2017, vol. 62, p. 29-39. (2016: 3.089 - IF, Q1 - JCR, 1.408 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0264-8377. Available at: <https://doi.org/10.1016/j.landusepol.2016.12.001> European cultural landscapes: Accounting for – 44 citations
6. ADCA - SCHINDLER, Stefan - O'NEILL, Fionnuala H. - BIRÓ, Marianna - DAMM, Christian - GASSO, Viktor - KANKA, Róbert - VAN DER SLUIS, Theo - KRUG, Andreas - LAUWAARS, Sophie G. - SEBESVARI, Zita - PUSCH, Martin T. - MARTIN, James R. - EULLER, Katrin - MAUERHOFER, Volker - WRBKA, Thomas. Multifunctional floodplain management and biodiversity effects: a knowledge synthesis for six European countries. In *Biodiversity and Conservation*, 2016, vol. 25, no. 7, p. 1349-1382. (2015: 2.258 - IF, Q1 - JCR, 1.243 - SJR, Q1 - SJR). (2016 - Current Contents). ISSN 0960-3115. Available at: <https://doi.org/10.1007/s10531-016-1129-3> - 42 citations
7. ADCA - PE'ER, Guy** - ZINNGREBE, Yves - MOREIRA, Francisco - SIRAMI, Clelia - SCHINDLER, Stefan - MÜLLER, Róbert - BONTZORLOS, Vasileios - CLOUGH, Dagmar - BEZÁK, Peter - BONN, Aletta - HANSJÜRGENS, Bernd - LOMBA, Angela - MÖCKEL, Stefan - PASSONI, Gioele - SCHLEYER, Christian - SCHMIDT, Jenny - LAKNER, Sebastian. A greener path for the EU Common Agricultural Policy : It's time for sustainable, environmental performance. In *Science*, 2019, vol. 365, iss. 6 452, p. 449-451. (2018: 41.063 - IF, Q1 - JCR, 13.251 - SJR, Q1 - SJR). (2019 - Current Contents). ISSN 0036-8075. Available at: <https://doi.org/10.1126/science.aax3146> – 36 citations
8. ADCA - DICK, Jan** - TURKELBOOM, Francis - WOODS, Helen - INIESTA-ARANDIA, Irene - PRIMMER, Eeva - SAARELA, Sanna-Riikka - BEZÁK, Peter - MEDERLY, Peter - LEONE, Michael - VERHEYDEN, Wim - KELEMEN, Eszter - HAUCK, Jennifer - ANDREWS, Chris - ANTUNES, Paula - ASZALÓS, Réka - BARÓ, Francesc - BARTON, David N. - BERRY, Pam - BUGTER, Rob - CARVALHO, Laurence - CZÚCZ, Bálint - DUNFORD, Rob - BLANCO, Gemma Garcia - GEAMANA, Nicoleta - GIUCA, Relu - GRIZZETTI, Bruna - IZAKOVIČOVÁ, Zita - KERTÉSZ, Miklós - KOPPEROINEN, Leena - LANGEMEYER, Johannes - LAPOLA, David Montenegro - LIQUETE, Camino - LUQUE, Sandra - PASTUR, Guillermo Martínez - MARTIN-LOPEZ, Berta - MUKHOPADHYAY, Raktima - NIEMELÄ, Jari - ODEE, David - PERI, Pablo Luis - PINHO, Patricia - PATRICIO ROBERTO, Gleiciani Bürger - PREDA, Elena - PRIESS, Joerg A. - RÖCKMANN, Christine - FERREIRA DOS SANTOS, Rui - SILAGHI, Diana - SMITH, Ron - VADINEANU, Angheluta - VAN DER WAL, Jan Tjalling - ARANY, Ildikó - BADEA, Ovidiu - BELA, Györgyi - BOROS, Emil - BUCUR, Magdalena - BLUMENTRATH, Stefan - CALVACHE, Marta - CARMEN, Esther - CLEMENTE, Pedro - FERNANDES, Joao - FERRAZ, Diogo - FONGAR, Claudia - GARCÍA-LLORENTE, Marina - GÓMEZ-BAGGETHUN, Erik - GUNDERSEN, Vegard - HAAVARDSHOLM, Oscar - KALÓCZKAI, Ágnes - KHALALWE, Thalma - KISS, Gabriella - KÖHLER, Berit - LAZÁNYI, Orsolya - LELLEI-KOVÁCS, Eszter - LICHUNGU, Rael - LINDHJEM, Henrik - MAGARE, Charles - MUSTAJOKI, Jyri - NDEGE, Charles - NOWELL, Megan - NUSS GIRONA, Sergi - OCHIENG, John - OFTEN, Anders - PALOMO, Ignacio - PATAKI, György - REINVANG, Rasmus - RUSCH, Graciela M. - SAARIKOSKI, Heli - SMITH, Alison - SOY MASSONI, Emma - STANGE, Erik - VAGNES TRAAHOLT, Nora - VÁRI, Ágnes - VERWEIJ, Peter - VIKSTRÖM, Suvi - YLI-PELKONEN, Vesa - ZULIAN, Grazia. Stakeholders' perspectives on the operationalisation of the ecosystem service concept: Results from 27 case studies. In *Ecosystem Services*, 2018, vol. 29, p. 552-565. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.09.015> - 30 citations
9. ADCA - WINKLER, Manuela - LAMPRECHT, Andrea - STEINBAUER, Klaus - HÜLBER, Karl - THEURILLAT, Jean-Paul - BREINER, Frank - CHOLER, Philippe - ERTL, Siegrun - GUTIÉRREZ-GIRÓN, Alba - ROSSI, Graziano - VITTOZ, Pascal - AKHALKATSI, Maia - BAY, Christian - ALONSO, José Luis Benito - BERGSTRÖM, Tomas - CARRANZA, Maria Laura -

CORCKET, Emmanuel - DICK, Jan - ERSCHBAMER, Brigitta - CALZADO, María Rosa Fernández - FOSAA, Anna Maria - GAVILÁN, Rosario - GHOSN, Dany - GIGAURI, Khatuna - HUBER, Doris - KANKA, Róbert - KAZAKIS, George - KLIPP, Martin - KOLLÁR, Jozef - KUDERNATSCH, Thomas - LARSSON, Per - MALLAUN, Martin - MICHELSEN, Ottar - MOISEEV, Pavel - MOISEEV, Dmitry - MOLAU, Ulf - MESA, Joaquín Molero - MORRA DI CELLA, Umberto - NAGY, Laszlo - PETEY, Martina - PUSCAS, Mihai - RIXEN, Christian - STANISCI, Angela - SUEN, Michael - SYVERHUSET, Anne O. - TOMASELLI, Marcello - UNTERLUGGAUER, Peter - URSU, Tudor-Mihai - VILLAR, Luis - GOTTFRIED, Michael - PAULI, Harald. The rich sides of mountain summits - a pan-European view on aspect preferences of alpine plants. In *Journal of Biogeography*, 2016, vol. 43, no. 11, p. 2 261–2 273. (2015: 3.997 - IF, Q1 - JCR, 2.786 - SJR, Q1 - SJR). (2016 - Current Contents). ISSN 0305-0270. Available at: <https://doi.org/10.1111/jbi.12835> – 28 citations

10. ADCA - BÜRGEL, Matthias - BIELING, Claudia - VON HACKWITZ, Kim - KIZOS, Thanasis - LIESKOVSKÝ, Juraj - MARTÍN, María García - MCCARTHY, Sarah - MÜLLER, Matthias - PALANG, Hannes - PLIENINGER, Tobias - PRINTSMANN, Anu. Processes and driving forces in changing cultural landscapes across Europe. In *Landscape Ecology*, 2017, vol. 32, p. 2 097-2 112. (2016: 3.615 - IF, Q1 - JCR, 1.780 - SJR, Q1 - SJR). (2017 - Current Contents). ISSN 0921-2973. Available at: <https://doi.org/10.1007/s10980-017-0513-z> - 27 citations
11. ADCA - ZULIAN, Grazia** - STANGE, Erik - WOODS, Helen - CARVALHO, Laurence - DICK, Jan - ANDREWS, Christopher - BARÓ, Francesc - VIZCAINO, Pilar - BARTON, David N. - NOWEL, Megan - RUSCH, Graciela M. - AUTUNES, Paula - FERNANDES, Joao - FERRAZ, Diogo - FERREIRA DOS SANTOS, Rui - ASZALÓS, Réka - ARANY, Ildikó - CZÚCZ, Bálint - PRIESS, Joerg A. - HOYER, Christian - PATRICIO ROBERTO, Gleiciani Bürger - LAPOLA, David Montenegro - MEDERLY, Peter - HALABUK, Andrej - BEZÁK, Peter - KOPPEROINEN, Leena - VIINIKKA, Arto. Practical application of spatial ecosystem service models to aid decision support. In *Ecosystem Services*, 2018, vol. 29, p. 465-480. (2017: 4.395 - IF, Q1 - JCR, 1.743 - SJR, Q1 - SJR). (2018 - Current Contents). ISSN 2212-0416. Available at: <https://doi.org/10.1016/j.ecoser.2017.11.005> - 25 citations
12. ADCA - IZAKOVIČOVÁ, Zita - MEDERLY, Peter - PETROVIČ, František. Long-term land use changes driven by urbanisation and their environmental effects (example of Trnava city, Slovakia). In *Sustainability - open access journal* [serial], 2017, vol. 9, no. 9, article no. 1 553. (2016: 1.789 - IF, Q2 - JCR, 0.548 - SJR, Q2 - SJR). (2017 - Current Contents). ISSN 2071-1050. ADOBE READER is required. Available at: <https://doi.org/10.3390/su9091553> – 25 citations

2.2.5. List of most-cited authors from the Institute (at most 10 % of the research employees with university degree engaged in research projects) and their number of citations in the assessment period (2015– 2020). The cited papers must bear the address of the institute

1. R. Kanka – 1393 citations (WOS CC – 1251, SCOPUS – 115)
2. Ľ. Halada – 1019 citations (WOS CC – 821, SCOPUS – 133)
3. J. Lieskovský – 913 citations (WOS CC – 764, SCOPUS – 125)

2.2.6. List of most-cited authors from the Institute (at most 10 % of the research employees with university degree engaged in research projects) and their number of citations obtained until 2020. The cited papers must bear the address of the Institute

1. R. Kanka – 1784 (WOS CC – 11524, SCOPUS – 179)
2. Ľ. Halada – 1019 (WOS CC – 821, SCOPUS – 133)
3. Z. Izakovičová – 981 (WOS CC – 410, SCOPUS – 130)

2.2.7. List of most-cited authors from the Institute (at most 10 % of the research employees with university degree engaged in research projects) and their number of citations obtained until 2021 of their papers published during the

evaluation period (2016– 2021). The cited papers must bear the address of the Institute

1. R. Kanka – 429 (WOS CC - 401, SCOPUS - 20)
2. V. Piscová – 330 (WOS CC – 309, SCOPUS – 13)
3. P. Bezák – 239 (WOS CC – 223, Scopus - 16)

2.3. Research status of the institute in international and national context

- **International/European position of the institute**

2.3.1. List of the most important research activities demonstrating the international relevance of the research performed by the institute, incl. major projects (details of projects should be supplied under Indicator 2.4). Max. 10 items for institute with less than 50 FTE researchers, max. 20 for institutes with 50 – 100 FTE researchers and so on

2.3.2. List of international conferences (co)organised by the institute

18th International Symposium - Landscape diversity and biodiversity, SAS Congress Center, Smolenice, Slovakia, 92 participants, International symposium on landscape ecological research focused on landscape diversity and biodiversity. organised regularly by the Institute of Landscape Ecology of the Slovak Academy of Sciences, 23.04.-27.04.2019

4th Forum Carpaticum - Future of the Carpathians: Smart, Sustainable, Inclusive, Bucharest, Romania, 188 participants, 28.09.-30.09.2016

5th Forum Carpaticum - Adaptation to Environmental and Social Risk in the Carpathian Mountain Region, Eger, Hungary, 109 participants, 15.10.-18.10.2018

6th Forum Carpaticum - Linking the environmental, political and societal needs for Carpathian sustainability, Brno, Czech Republic, 180 participants, 21.06.-25.06.2021

Global megatrends and Slovakia, Congress Center SAS Smolenice, Slovakia, 78 participants, 19.09.-21.09.2016.

RegioResources 21-2018, Global Megatrends and Landscape, Congress Center SAS Smolenice, Slovakia, 60 participants, 17.04.-19.04.2018.

Symposium: Integrative Assessment of Land use conflicts (15th Congress of European Ecological Federation), Lisbon, Portugal, 45 participants, 29.07.-02.08.2019

EuroMAB Conference "Building a Sustainable Future Together, Sarlat de Caneda, France, 220 participants, 04.04. – 07.04.2017.

MAB Conference "Nature Services near Managed Ecosystems", Smolnícka osada, Slovakia, 14 participants, 08.04. – 10.04.2017.

ALTER–Net conference 2017: Nature and society: synergies, conflicts, trade–offs, Ghent, Belgium, 300 participants, 02.05.–05.05.2017

Wooded rural landscapes of Central and Eastern Europe: biodiversity, cultural legacy and conservation, University of Rzeszów, Poland, 40 participants, 20–22 September 2017

Current issues in the sciences of the landscape: environment, society, politics, Tbilissi, Georgia, 50 participants, 09.09.-13.09.2019

Socio-Ecological Practice Research for Sustainable Landscape Governance, Bucharest, Romania, 100 participants, 06.09.-09.09.2020

Landscape Science and Landscape Ecology: Considering responses to global challenges. 1st IALE - Russia International Conference, Moscow, Russia, 80 participants, 14.09.-16.09.2020.

SCERIN-4 Capacity Building Workshop (South Central and Eastern European Regional Information Network), Zvolen, Slovakia, 45 participants, 19.07.-22.07.2016

Traditional ecological knowledge and oral history: Improving landscape research, conservation management and environmental education. Dolné Obdokovce, Slovakia, 42 participants, 14.04.-15.04.2016

TEKedu V4 - Traditional ecological knowledge and unwritten history: From intention to applications - edible wild plants. Nitra - Kolíňany, Slovakia, 30 participants, 11.05.-11.05.2018

OpenNESS 4th Annual Meeting. Congress Center SAS Smolenice, Slovakia, 100 participants, 20.03. – 23.03.2017

European Topic Center on Biological Diversity seminar. Congress Center SAS Smolenice, Slovak Republic, 28 participants, 15.10.-16.10.2019.

2.3.3. List of edited proceedings from international scientific conferences

Landscape and landscape ecology: proceedings of the 17th International Symposium on Landscape Ecology (proceedings are indexed in WOS CC). Editors Ľuboš Halada, Andrej Bača, Martin Boltižiar. Bratislava: Institute of Landscape Ecology SAS, 2016. 365 p. ISBN 978-80-89325-28-3 (Landscape and Landscape Ecology) Type: FAI

2.3.4. List of journals edited/published by the institute and information on their indexing in WOS, SCOPUS, other database or no database, incl. impact factor and other metrics of journals in each year of the assessment period

Ecology (Bratislava) is an international scientific journal that focuses on publishing the latest results of ecological research, especially in the fields of landscape ecology, ecosystem ecology, population ecology, nature conservation and human impact on ecosystems. It publishes articles from the theoretical and methodological as well as from the practical field which are focused on landscape conservation and creation, the dynamics of natural processes and landscape change. The journal has been published four times a year since 1982 under several names: until 1989 under the name Ecology (CSSR), until 1992 Ecology (CSFR), and since 1993 Ecology (Bratislava). Since 2013 it has been published as an Open Access journal by De Gruyter. The journal is indexed in the databases AGRICOLA (National Agricultural Library), Baidu Scholar, Biobase, CABI (over 50 subsections), CNKI Scholar (China National Knowledge Infrastructure), CNPIEC - cnpLINKer, Dimensions, DOAJ (Directory of Open Access Journals), EBSCO (relevant databases), EBSCO Discovery Service, Engineering Village, Geobase, GeoRef, Google Scholar, Japan Science and Technology Agency (JST), J-Gate, JournalGuide, JournalTOCs, KESLI-NDSL (Korean National Discovery for Science Leaders), Microsoft Academic, MyScienceWork, Naver Academic, Naviga (Softweco), Primo Central (ExLibris), Publons, QOAM (Quality Open Access Market), ReadCube, Reaxys, SCImago (SJR), SCOPUS, Semantic Scholar, Summon (ProQuest), TDNet, Ulrich's Periodicals Directory/ulrichsweb, WanFang Data, Web of Science - Biological Abstracts, Web of Science - BIOSIS Previews, Web of Science - Zoological Record, and WorldCat (OCLC)

Indexing the journal by year:

2021: SCOPUS, Q3; 2020: SCOPUS, Q3; 2019: SCOPUS, Q3; 2018: SCOPUS, Q3; 2017: SCOPUS, Q3; 2016: SCOPUS, Q3

• National position of the institute

2.3.5. List of selected activities of national importance

A number of ILE SAS staff members have been appointed to doctoral study committees:

- RNDr. Peter Barančok, CSc., Doc. RNDr. Zita Izakovičová, PhD., Dr.h.c. Prof. RNDr. László Miklós, DrSc. (Landscape Protection and Use)
- Dr.h.c. Prof. RNDr. László Miklós, DrSc. (Environmental Engineering)
- Dr.h.c. Prof. RNDr. László Miklós, DrSc., RNDr. Ľuboš Halada, CSc. (Environmental Management)
- Doc. RNDr. Zita Izakovičová, PhD. (Landscaping)

A number of ILE SAS staff members have served as members of scientific councils and boards of trustees of universities and faculties:

- Doc. RNDr. Zita Izakovičová, PhD. (scientific council, Faculty of Ecology and Environmental Science, TUZVO)
- Doc. RNDr. Zita Izakovičová, PhD. (scientific councils, Faculty of Natural Sciences, Charles University Faculty of Science)
- Assoc. RNDr. Zita Izakovičová, PhD. (scientific council, Slovak University of Agriculture in Nitra)
- Doc. RNDr. Zita Izakovičová, PhD. (board of trustees, Slovak University of Agriculture in Nitra)
- Dr.h.c. Prof. RNDr. László Miklós, DrSc. (scientific council, Faculty of Ecology and Environmental Science TUZVO)
- Dr.h.c. Prof. RNDr. László Miklós, DrSc. (scientific council, Technical University of Zvolen)
- Ing. Július Oszlányi, CSc. (European Academy of Sciences, Arts and Letters, Paris)
- Prof. PhDr. RNDr. Martin Boltžiar, PhD. (scientific council, Faculty of Humanities and Natural Sciences PU)

ILE SAS staff have served and continue to serve on various professional and expert committees in ministries:

- Mgr. Ján Černecký :
 - National Reference Centre for Biodiversity (NRC - EU), biodiversity expert,
 - Expert Group on Reporting (EU), national biodiversity expert,
 - MAES Working Group (Ministry of Environment of the Slovak Republic), expert on the assessment of selected ECs
- RNDr. Peter Gajdoš, CSc.
 - Slovak Ramsar Committee, member of the plenary of the Ministry of the Environment,
 - Coordination Council for Monitoring and Reporting under Article 17 of the Habitats Directive
- Mgr. Andrej Halabuk, PhD.
 - Member of the Commission for Space Activities in the Slovak Republic
- RNDr. Ľuboš Halada, CSc.
 - Inter-ministerial Commission for ensuring the implementation of the Framework Convention on the Conservation and Sustainable Development of the Carpathians,
 - Commission for coordination of activities of the Slovak Republic in ESFRI projects oriented to materials, physical sciences, with application potential in biological and medical sciences, chemical sciences and information technologies.
- Doc. RNDr. Zita Izakovičová, PhD.
 - Working Group on Biodiversity at the Ministry of Environment of the Slovak Republic,
 - Expert Working Group on the Environment within the Integrated Spatial Strategy for Sustainable Urban Development (Trnava) and its functional area,
 - Commission for granting professional competence for the preparation of nature conservation documentation at the Ministry of Environment of the Slovak Republic,
 - Slovak Accreditation Agency for Higher Education,
 - SASPRO 2 Steering Committee,
- Mgr. Henrik Kalivoda, PhD.
 - Working Group on Biodiversity at the Ministry of the Environment of the Slovak Republic,
- RNDr. Róbert Kanka, PhD.
 - Working Group on Biodiversity at the Ministry of the Environment of the Slovak Republic
 - MAES Working Group on Ecosystem Services at the Ministry of the Environment of the Slovak Republic,
 - Working Group on Measures for the Restoration of Degraded Wetland Ecosystems (ClimaLocal) under the SK-Climate Programme - at the Ministry of the Environment of the Slovak Republic,
 - ESFRI eLTER Research Infrastructure Interim Council
- Dr.h.c. Prof. RNDr. László Miklós, DrSc.

- Working Group of the Accreditation Commission for the Research Area "Agricultural and Forestry Sciences" - an advisory body of the Government of the Slovak Republic at the Ministry of Education and Science of the Slovak Republic,
- Advisor to the Minister of Environment
- Mgr. Veronika Piscová, PhD.
 - Slovak Committee of the Man and Biosphere Programme (MAB) at Ministry of Foreign Affairs and European Affairs of the Slovak Republic,
 - The World Network of Mountain Biosphere Reserves
- Ing. Jana Špulerová, PhD.
 - MAES Working Group on Ecosystem Services at the Ministry of Environment of the Slovak Republic,
 - Working Group on Measures for the Restoration of Degraded Wetland Ecosystems (ClimaLocal) under the SK-Climate Programme at the Ministry of the Environment of the Slovak Republic

Institute staff serve on various SAS committees:

- Doc. RNDr. Zita Izakovičová, PhD. - SAS Commission for Environment,
- Mgr. Henrik Kalivoda, PhD - SAS Commission for Infrastructure and Structural Funds,
- Dr.h.c. Prof. RNDr. László Miklós, DrSc. - member of the doctoral dissertation defence committee for the degree of DrSc. in Ecology
- RNDr. Milena Moyzeová, PhD. - SAS Ethics Committee
- RNDr. Peter Barančok, CSc., Assoc. RNDr. Zita Izakovičová, PhD. - VEGA Commission No. 2 for Earth and Space Sciences and Environmental Sciences (including Earth Resources)
- RNDr. Marta Dobrovodská, PhD, Mgr. Jozef Kollár, PhD - VEGA Commission No. 8 for soil, veterinary and wood sciences

The Slovak Ecological Society at the Slovak Academy of Sciences (SEKOS) operates at the Institute. SEKOS is an association of scientists and professionals founded to promote the development of ecology. It also aims to disseminate the knowledge gained through ecological research, to apply this knowledge to the management of the landscape and the human environment and other living organisms, to coordinate the collaborations between members working in science, schools and practice, to raise the professional level of young workers, and to provide expert opinions and consultancy services for state and social institutions.

2.3.6. List of journals (published only in the Slovak language) edited/published by the institute and information on their indexing in WOS, SCOPUS, other database or no database, incl. impact factor and other metrics of journals in each year of the assessment period

Ecological Studies - This peer-reviewed scientific journal is published in the Slovak language; it is not indexed in databases. It is published by the Slovak Ecological Society at the Slovak Academy of Sciences. The Institute of Landscape Ecology of the Slovak Academy of Sciences together with the Department of Ecology and Environmental Science of the Faculty of Natural Sciences of the Constantine the Philosopher University Nitra participate in the publishing activities. The journal publishes original scientific papers in the field of ecology, landscape ecology, environmental science, and ecological and environmental education, as well as in related scientific disciplines. Ecological Studies has been published twice a year since 2010. We have just published the 12th issue, containing 11 original scientific papers. The journal was created by transforming the monograph Ecological Studies into a periodical, as a response to the situation of a lack of any platform for the publication of the original works of Slovak authors in the field. An international editorial board is responsible for the professional aspect of the journal.

Životné prostredie – Peer-reviewed scientific journal, published in the Slovak language. Publication of the journal was terminated in 2021.

- **Position of individual researchers in the international context**

2.3.7. List of invited/keynote presentations at international conferences, as documented by programme or invitation letter

HALADA, Ľ. – LIESKOVSKÝ, J. - DOBROVODSKÁ, M. - MOJSES, M.: Grassland changes in Slovak Carpathians related to decline of the agriculture. – In III. Międzynarodowa Konferencja Pastorska „Krajobraz kulturowy Karpat – wspólne dziedzictwo człowieka i przyrody”. 7.- 8. 3. 2016, Zakopane, Poľsko

IZAKOVIČOVÁ, Z. – MIKLÓS, L.: Vývoj predpovedného systému na ochranu viniča (Development of a forecasting system for vine protection). NATURE EXPO, 11.5.–14. 5. 2017, Brno, Czech Republic

KANKA, R.: Natural capital and the nature–society interface. ALTER–Net 2017 conference „Synergies, conflicts and trade–offs in the relationship between nature and society“, 2.5.–4.5. 2017, GHENT, Belgium

KENDERESSY, P.: Voda v Krajine. Fyzickogeografický seminár: Fyzická geografie – krajinná ekologie – udržateľný rozvoj (Water in the landscape. Physical geography seminar: Physical geography - landscape ecology - sustainable development), 8.2.–9.2. 2017, Brno, Czech Republic

MIKLÓS, L. – ŠPINEROVÁ, H.: A környezetvédelem kormányzása és környezeti tudományok. XIII. KÁRPÁT–MEDENCEI KÖRNYEZETTUDOMÁNYI KONFERENCIA. (Environmental management and environmental sciences. XIII. Carpathian Basin Environmental Conference), 5.4.–8.4. 2017, Cluj, Romania

MIKLÓS, L. – ŠPINEROVÁ, H.: Natural and Cultural Heritage and Traditions as an Opportunity for All International Conference „Benefits Beyond Inscription: Leveraging the UNESCO Brand for Sustainable Tourism Development in Central European Regions. 5.5. 2017, Bardejov, Slovakia

PETRÁŠ, R. – MECKO, J. – OSZLÁNYI, J. – PETRÁŠOVÁ, V.: Natural production of the calorific value from poplar clones and socio–economic aspects of its wider use in Slovakia. 25th International symposium Deltas and Wetlands, 18.5.–20.5. 2017, Tulcea, Romania

MÁZSA, K., HALADA, Ľ., KEETON, W., SLEE, B., NIJNIK, M., MOLNÁR, ZS., KAIM, D., ZAWIEJSKA, J., WYZGA, B., ÓDOR, P., MITROFANENKO, T., KÖNCZEY, R., VETIER, M., VARGA, A. ET AL., 2018: 5th Forum Carpaticum 2018. Adapting to Environmental and Social Risk in the Carpathian Mountain Region. – In: Implementation Committee of the Carpathian Convention, Vienna, Austria, 17.12. 2018

MIKLÓS, L.: Biodiverzitás, tájdiverzitás és az integrált tájmenedzsment (Biodiversity, Landscape Diversity and Integrated Landscape Management, Current Results in Biological Sciences and Education (Ecology, Sustainable Development and Politics, Symposium "Ethical Issues in Science"), SZMAT, J. Selye University, Komárno, Slovakia, 4.4. 2018

MIKLÓS, L.: Natural sciences, decision making and global megatrends, Regio Resources 21-2018 Global megatrends and landscape, SAS Congress Center, Smolenice, Slovakia, 17.4. - 19.4 2018

MIKLÓS, L. - ŠPINEROVÁ, A.: A Kelet-szlovákiai-síkság vízháztartásának tájékológiai elemzése (Landscape-ecological analysis of the water balance of the East Slovakian lowlands), Conference „Debreceni Hidrobiológus Fórum (Debrecen Hydrobiologist Forum) – 2018“, 6.12. 2018, Hungary

MOYZEOVÁ, M.: Zapojenie verejnosti do hodnotenia prírodného kapitálu ekosystémových služieb a zelená infraštruktúra (Public involvement in the assessment of natural capital of ecosystem services and green infrastructure), 35. výročná konferencia fyzickogeografickej sekcie České geografické společnosti, Fyzická geografie a krajinná ekologie – výskum, výuka, aplikácie (35th annual conference of the Physical Geographical Section of the Czech Geographical Society, Physical Geography and Landscape Ecology - research, teaching, applications), Czech Republic, Brno, 13.2. - 14.2. 2018

OSZLÁNYI, J.: Energy value of the aboveground biomass of the oak-hornbeam forest, Conference Energy Barge Modal Shift Platform, hotel Holiday Inn, Bratislava, 21.11. 2018

- IZAKOVIČOVÁ, Z. Research topic in urban-peri urban area – ILE SAS. INLAND workshop. 24.VI. – 27. VI. 2019, SRN, Halle
- IZAKOVIČOVÁ, Z. Integrated approach to sustainable land use. 15th *EEF* – European Ecological Federation Congress, *Embedding Ecology in Sustainable Development Goals*. 29. 7. – 2. 8. 2019, Portugal, Lisabon
- MIKLÓS, L.- ŠPINEROVÁ, A.- OFFERTÁLEROVÁ, M. Tájökológiai main-stream témák és ezek tudományos megközelítése (Landscape-ecological main stream themes and their scientific approximation). 15th Carpathian Basin Conference for Environmental Science 3–6 April 2019, Sapientia Hungarian University of Transylvania, Cluj-Napoca, Romania, 3.4.2019
- MIKLÓS, L. A Selmecebányai sztratóvulkán meghatározó adottságai a tájstruktúra fejlődésére (Decisive influences of the Štiavnica stratovolcano on the landscape development). A táj változásai a Kárpát-medencében. XII. tájtörténeti tudományos konferencia (Landscape changes in the Carpathian Basin. XII. landscape history scientific conference). SZIE Szarvasi Arborétum. Hungary, Szarvas, 27.6.2019
- MIKLÓS, L. Scientific base of selected landscape-ecological main-stream themes. Ecology across borders. 15th *EEF* – European Ecological Federation Congress *Embedding Ecology in Sustainable Development Goals*. EEF Congress. Portugal, Lisbon, 30.7.2019
- MIKLÓS, L.- IZAKOVIČOVÁ, Z. The integrated management of the landscape and the conflicts in the landscape. Federation 15th *EEF* – European Ecological Congress. *Embedding Ecology in Sustainable Development Goals*. EEF Congress. Portugal, Lisbon, 30.7.2019
- MIKLÓS, L. Környezetvédelem és környezetpolitika (Environmental Protection and environmental politics). Workshop „Celebration of the Hungarian Science”. University of Debrecen, Faculty of Science and Technology, Hungary, Debrecen, 19.11.2019
- MIKLÓS, L. The geosystem approach to the atlas design in Slovakia: examples on national and regional level. Forum “Dynamic Mapping and services for Yangtze Delta ecological civilization”. Nanjing Normal University, Nanjing, China, 13.12.2019
- MIKLÓS, L. The methodics of the creation of the national Landscape Atlas of Slovakia. Seminar The atlas design for ecological civilization and services. Nanjing Normal University, Nanjing, China, 14.12.2019
- MIKLÓS, L. The environmental regionalisation of Slovak Republic. Seminar „Big data, artificial intelligence and sustainable development of geographic information in Europe and Asia”, Deqing, China, 16.12.2019
- OSZLÁNYI, J. Energy value of aboveground biomass of poplar trees of Robusta and Pannonia clones. Conference of European Academies Science Advisory Council – Environment Steering Panel, Bratislava, 2.10. - 4.10.2019
- RUSŇÁK, T. Earth Observation methods in biotic forest disturbance, Research at Institute of Landscape Ecology, Poľsko, Krakov, 13.11. - 14.11.2019
- ŠPULEROVÁ, J. Scattered settlement landscapes Slovakia. 11th EUCALAND Workshop, Slovinsko, Otočec, 15. - 17.4.2019
- ŠPULEROVÁ, J. Research of traditional agricultural landscape in Slovakia. Bilateral Slovak-Ukrainian Workshop. 25. X. 2019, Lviv, Ukraine
- MIKLÓS, László. Boj o Slovenské múzeum ochrany prírody a speleológie v rokoch 2000 až 2020. Medzinárodná konferencia 90 rokov Slovenského múzea ochrany prírody a jaskyniarstva (Fight for Slovak Museum of Nature Protection and Speleology in 2000-2020. International conference of 90 years of the Slovak Museum of Nature Protection and Speleology). September 28 - 30, 2020. Slovak Museum of Nature Protection and Speleology. Liptovský Mikuláš, Slovakia
- BOLTIŽIAR, M.: Mapovanie a hodnotenie zmien krajiny aplikáciou historických máp a leteckých a satelitných snímok v prostredí geografických informačných systémov. SYNERGIA PRÍRODNÝCH EKOSYSTÉMOV V KRAJINE - medzinárodná vedecká konferencia (Mapping and evaluation of landscape changes by applying historical maps and aerial and satellite images in the environment

of geographic information systems. SYNERGY OF NATURAL ECOSYSTEMS IN THE LANDSCAPE - international scientific conference), online 7.12.2021

MERGANIČOVÁ, K. Remote sensing hot topics in SLOVAKIA. Joint MedRIN and SCERIN Virtual Capacity Building Workshop on Earth System Observations, online, 15.6.-16.6.2021

MIKLÓS L., IZAKOVIČOVÁ Z., ŠPINEROVÁ A.: Global megatrends and their selected encounters with sciences. Socio-geographical processes in Central and Eastern Europe: problems, tendencies, trends. II. Ferenc Rákóczi Transcarpathian Hungarian College), Beregovo (Ukraine) 25.3.2021 - online

MIKLÓSOVÁ, V. Water regime improvement in National Nature Reserve Klátovské rameno river arm. The 28th International Scientific Jubilee Symposium "Deltas and Wetlands" 2021 – organized by "Danube Delta" National Institute for Research and Development Tulcea, Romania, online – 13.9.-18.9.2021

ŠPULEROVÁ, J. Climate changes and the impact on water in the agricultural sector. SK-Climate Forum, 9.12.2021, online

2.3.8. List of researchers who served as members of the organising and/or programme committees

Peter Barančok – 18th International Symposium - Landscape diversity and biodiversity - organising committee (chairman), Smolenice, Slovakia, 2019.

Mária Barančoková - 18th International Symposium - Landscape diversity and biodiversity - organising committee (chairman), Smolenice, Slovakia, 2019.

Peter Bezák - OpenNESS 4th Annual Meeting – organising committee, Smolenice, Slovakia, 2017

Peter Bezák - NEEMO ILE regional meeting, organising committee, Bratislava, Slovakia, 2019

Magdaléna Bezáková - NEEMO ILE regional meeting, organising committee, Bratislava, Slovakia, 2019

Marta Dobrovodská - 9th EUCALAND workshop, organising committee, Svätý Jur, Slovakia, 2017

Peter Gajdoš - Seminár European Topic Centre on Biological Diversity, organising committee, Smolenice Slovakia, 2019

Katarína Gerháťová - Workshop European Topic Centre on Biological Diversity, organising committee, Smolenice Slovakia, 2019

Andrej Halabuk - SCERIN-4 Capacity Building Workshop, organising committee, Zvolen, Slovakia, 2016

Ľuboš Halada – 4 th Forum Carpathicum - Future of the Carpathians: Smart, Sustainable, Inclusive, programme committee, Bucharest, Romania, 2016

Ľuboš Halada – 5th Forum Carpathicum, programme committee, Eger, Hungary, 2018

Ľuboš Halada - Workshop European Topic Centre on Biological Diversity, organising committee, Smolenice, Slovakia, 2019

Ľuboš Halada – Symposium Integrative Assessment of Land Use Conflicts at the 15th Congress of the European Ecological Federation, programme committee, Lisbon, Portugal, 2019

Ľuboš Halada – 6 th Forum Carpathicum. Linking the environmental, political and societal needs for Carpathian sustainability, programme committee, Brno, Czechia, 2020

Zita Izakovičová – Global Existential Risk 2016, programme/ scientific committee, Bratislava, Slovakia, 2016

Zita Izakovičová - Global megatrends and Slovakia, programme committee, Smolenice, Slovakia, 2016

Zita Izakovičová - Traditional Ecological Knowledge and Oral History, programme committee, Dolné Obdokovce, Slovakia, 2016

Zita Izakovičová - Landscape diversity and biodiversity – 18th Symposium, programme - scientific committee committee, Smolenice, Slovakia, 2017

Zita Izakovičová - SPATIAL ECONOMY, CURRENT STATUS AND FUTURE CHALLENGES – INTERDISCIPLINARY APPROACH, programme committee, Wroclav, Poland, 2017

Zita Izakovičová - workshop OpenNESS, programme/organising committee, Smolenice, Slovakia, 2017

Zita Izakovičová - 100 years of Bulgarian geography, programme committee, Universita Kliment Ohridski, Sofia, Bulgaria, 2018

Zita Izakovičová – 18th International Symposium - Landscape diversity and biodiversity, programme committee, Smolenice, Slovakia, 2018

Zita Izakovičová – 5th Scientific Symposium Ecosystem Services in Transdisciplinary Approach, programme committee, Poznań, Poland, 2018

Zita Izakovičová – RegioResources 21-2018, Global Megatrends and Landscape, chairman of programme committee, Smolenice, Slovakia, 2018

Zita Izakovičová – TEKedu V4 - Tradičné ekologické poznatky a nepísaná história: Od zámeru k aplikáciám – jedlé divorastúce rastliny (Traditional ecological knowledge and unwritten history: From Intention to Applications - Edible Wild Plants), programme committee, Nitra-Kolíňany, Slovakia, 2018

Zita Izakovičová - Landscape diversity and biodiversity – 18th Symposium, programme – scientific committee, Smolenice, 2019

Zita Izakovičová - Symposium Integrative Assessment of Land Use Conflicts at the 15th Congress of the European Ecological Federation, programme committee, Lisbon, Portugal, 2019

Zita Izakovičová - Výskum sociálno-ekologickej praxe pre trvalo udržateľnú správu krajiny (Research on socio-ecological practices for sustainable land management), Bucharest, Romania, 100 účastníkov, 06.09.-09.09.2020, programme committee, online, 2020

Zita Izakovičová - Landscape Science and Landscape Ecology: Considering responses to global challenges. 1st IALE - Russia International Conference, Moscow, Russia, 80 participants, 14.09.-16.09.2020, programme committee, online, 2020

Henrik Kalivoda – 18 th International Symposium on Problems of Landscape Ecological Research „Landscape diversity and biodiversity“, organising committee, Smolenice, Slovakia, 2019

Róbert Kanka - ALTER-Net conference 2017: Nature and society: synergies, conflicts, trade-offs, organising committee, Ghent, Belgium, 2017

Róbert Kanka – 18th International Symposium - Landscape diversity and biodiversity, programme/organising committee, Smolenice, Slovakia, 2019

Róbert Kanka - Seminár European Topic Centre on Biological Diversity, organising committee, Smolenice, Slovakia, 2019

Jozef Kollár – 18th International Symposium - Landscape diversity and biodiversity, organising committee, Smolenice, Slovakia, 2019

Ivana Kozelová - OpenNESS 4th Annual Meeting – organising committee, Smolenice, Slovakia, 2017

Ivana Kozelová – 18th International Symposium - Landscape diversity and biodiversity, organising committee, Smolenice, Slovakia, 2019

Ivana Kozelová - RegioResources 21-2018, Global Megatrends and Landscape, organising committee, Smolenice, Slovakia, 2018

Ivan Laco – 18th International Symposium - Landscape diversity and biodiversity, organising committee, Smolenice, Slovakia, 2019

László Miklós - 15th Carpathian Basin Conference for Environmental Science, programme committee, Cluj-Napoca, Romania, 2019

László Miklós - Integrative Assessment of Land use conflicts - 15th Congress of the European Ecological Federation, programme committee, Lisbon, Portugal, 2019

László Miklós - VIIIth International Scientific Conference under the auspices of the Ministry of Environment of the Slovak Republic: Selected Aspects of Integrated Environmental Management, programme committee (scientific guarantor), Zvolen, Banská Štiavnica Slovakia, 2019

László Miklós - 16th Carpathian Basin Conference for Environmental Science, programme/organising committee, Budapest, Hungary, 2021

László Miklós - Human Geographical Processes in East Central Europe: Problems, Tendencies and Trends. Beregov, scientific/programme/organising committee, Beregov, Ukraine, 2021

László Miklós - Landscape Science and Landscape Ecology: Considering responses to global challenges. 1st IALE - Russia International Conference, programme committee, online, Moscow, Russia, 2020

Milena Moyzeová - International scientific conference GEOBALCANICA, programme committee, Skopje, Macedonia, 2016

Andrej Palaj – 18th International Symposium - Landscape diversity and biodiversity, organising committee, Smolenice, Slovakia, 2019

Andrej Palaj – Workshop European Topic Centre on Biological Diversity, programme/organising committee, Smolenice, Slovakia, 2019

Veronika Piscová - Workshop European Topic Centre on Biological Diversity, organising committee, Smolenice, Slovakia, 2019

Tomáš Rusňák - SCERIN-4 Capacity Building Workshop, organising committee, Zvolen, Slovakia, 2016

Jana Špulerová - 9th EUCALAND workshop, programme/organising committee, Bratislava, Slovakia, 2017

Jana Špulerová - Current problems of land sciences: environment, society, politics, organising committee, Tbilisi, Georgia, 2019

Jana Špulerová - Workshop European Topic Centre on Biological Diversity, organising committee, Smolenice, Slovakia, 2019

Jana Špulerová - Spoločná poľnohospodárska politika (SPP) po roku 2020: nová zelená architektúra, nové ekologické schémy a ukazovatele biodiverzity (The Common Agricultural Policy (CAP) after 2020: new green architecture, new ecological schemes and biodiversity indicators), programme/organising committee, online workshop, 2020

Dagmar Štefunková - Wooded Rural Landscapes in Central and Eastern Europe: biodiversity, cultural legacy and conservation, programme committee, Rzesów – Eger, Poland - Hungary, 2017

Dagmar Štefunková - 9th EUCALAND workshop, programme/organising committee, Bratislava, Slovakia, 2017

2.3.9. List of researchers who received an international scientific award

Kozelová Ivana

Danubius Young Scientist Award 2020, awarded by the Federal Ministry of Education, Science and Research, Austria (BMBWF), Institute for the Danube Region and Central Europe (IDM)

Bolťižiar Martin

Crystal Plaque "Best Speaker" for a scientific presentation. The award was presented at the closing ceremony by the Chairman of the Scientific Committee of the International Multidisciplinary Scientific GeoConference (SGEM 2017) in Austria.

Lieskovský Juraj

The award for "Outstanding Paper in Landscape Ecology" by the North American Regional

Association of the International Association for Landscape Ecology. The awarded article: Bürgi, M., Bieling, C., Hackwitz, K. von, Kizos, T., Lieskovský, J., Martín, M.G., McCarthy, S., Müller, M., Palang, H., Plieninger, T., Printsman, A., 2017. Processes and driving forces in changing cultural landscapes across Europe. *Landscape Ecol* 32, 2097–2112. <https://doi.org/10.1007/s10980-017-0513-z>

Miklósová Viktória

Danubius Young Scientist Award 2019, awarded by the Federal Ministry of Education, Science and Research, Austria (BMBWF), Institute for the Danube Region and Central Europe (IDM)

Oszlányi Július

European Commission's "The Think Tank Award 2018" for his work at the European Academies' Science Advisory Council (EASAC-ESP)

- **Position of individual researchers in the national context**

2.3.10. List of invited/keynote presentations at national conferences, as documented by programme or invitation letter

DAVID, S. - PETROVIČOVÁ, K. - ÁBELOVÁ, M.: Vážky ako ich (ne)poznáme. Konferencia „Zoológia 2016“ (Dragonflies as we (don't) know them. "Zoology 2016" Conference). Constantine the Philosopher University in Nitra, 24.11.–26.11.2016.

IZAKOVIČOVÁ, Z. – OSZLÁNYI, J.: Skúsenosti s riešením rámcových projektov EÚ. Infodeň H2020 (Experience with implementing EU framework programmes. Info day H2020). Slovak Centre of Scientific and Technical Information, Bratislava, 16.11. 2017.

IZAKOVIČOVÁ, Z. – POVAŽAN, R.: Rastúci tlak na ekosystémy GM8. Workshop Stav životného prostredia Slovenskej republiky v kontexte globálnych zmien (Growing pressure on GM8 ecosystems. Workshop – State of the environment of the Slovak Republic in the context of global changes). Ministry of Environment of the Slovak Republic, Bratislava, 25.5. 2017.

IZAKOVIČOVÁ, Z.: Stav životného prostredia v regiónoch SR. Rozhovory s vedou (State of the environment in the regions of the Slovak Republic. Interviews with science). Alumni club, Slovak University of Technology, Bratislava, 6.6. 2017.

MIKLÓS, L.: Geologické štruktúry, nerastné suroviny a životné prostredie (vzťah dobývanie nerastov – životné prostredie). XIX. Odborný seminár SZVK (Geological structures, minerals and the environment – relationship between mining and the environment. 19th Scientific seminar of the Slovak Association of Aggregate Producers). Nový Smokovec, 9.11.–10.11.2017.

MIKLÓSOVÁ, V.: Vybrané aspekty integrovaného manažmentu životného prostredia. "Ciele trvalo udržateľného rozvoja: SDG 6 so zreteľom na čistú vodu a hygienu, turizmus, prírodné a kultúrne dedičstvo". V. medzinárodná konferencia (Selected aspects of integrated environmental management. "Sustainable Development Goals: SDG 6 with regard to clean water and sanitation, tourism, natural and cultural heritage". 5th International Conference). Technical University in Zvolen, 23.10.2017.

GAJDOŠ, P.: Pavúky (Araneae) Oravských rašelinísk. Seminár Rašeliniská na Orave (Spiders (Araneae) of Orava peat bogs. Peat bogs in Orava Seminar). Orava Museum of P. O. Hviezdoslav, Oravský Podzámok, 20.6. - 21.6. 2018.

HALABUK, A.: Ako využiť pre svoje potreby európske satelitné dáta Sentinel? Konferencia GeoSpatial Visions 2018 (How to use the European satellite data Sentinel for your needs? GeoSpatial Visions 2018 Conference). Sitno, Vyhne, 27.9. - 28.9. 2018.

MIKLÓS, L.: Ekológia a obnoviteľné zdroje v EÚ, Celonárodná diskusia „#MYSMEEÚ“ (Ecology and renewables sources in the EU, Nationwide debate “#WEAREEU”). Technical University in Zvolen, 10.4. 2018.

MOYZEOVÁ, M. – DOBROVODSKÁ, M.: Krajina Slovenska - naše kultúrne dedičstvo, Týždeň udržateľnosti na EU v Bratislave (The land of Slovakia - our cultural heritage, Sustainability Week at the University of Economics in Bratislava). University of Economics in Bratislava, 8.11. 2018.

ŠPULEROVÁ, J.: Hodnotenie stavu rašelinísk v povodí Bielej Oravy, Seminár Rašeliniská na Orave (Evaluation of the state of peat bogs in the Biela Orava river basin, Peat bogs in Orava Seminar). Orava Museum of P. O. Hviezdoslav, Oravský Podzámok, 20.6. - 21.6. 2018.

DAVID, S.: Indikujú vážky (Odonata) stav a trendy zmien oravských rašelinísk? Seminár Rašeliniská na Orave (Do dragonflies (Odonata) indicate the state and trends of peat bogs changes of Orava? Peat bogs in Orava Seminar), Orava Museum of P. O. Hviezdoslav, Oravský Podzámok, 20.6. - 21.6. 2018.

ČERNECKÝ, J., ĎURICOVÁ, V., KANKA, R. Prínos siete chránených území z hľadiska migračných koridorov a obmedzení na Slovensku. Výskum a ochrana cicavcov na Slovensku. 14. celoštátna vedecká konferencia s medzinárodnou účasťou (The benefit of the network of protected areas in terms of migration corridors in Slovakia. Research and protection of mammals in Slovakia. 14th National scientific conference with international participation). Banská Bystrica, 14.11. – 15. 11.2019.

HALADA, L., EEA European Topic Centre on Biological Diversity. - National meeting of National Reference Centres of Eionet Slovakia, Banská Bystrica, 12.12.2019.

MIKLÓS, L. Novodobá história ochrany prírody (od roku 1989). Konferencia 100 rokov ochrany prírody na Slovensku (Modern history of nature protection (since 1989). Conference of 100 years of nature protection in Slovakia). Tále, 15.10.2019.

MIKLÓS, L. Životné prostredie, ekologická politika a verejná správa. 25. stretnutie seniorov štátnej ochrany SR (Environment, environmental policy and public administration. 25th meeting of seniors of the State Nature Conservancy). Slovak Museum of Nature Protection and Speleology, Liptovský Mikuláš, 9. 10.2019.

MOYZEOVÁ, M. Vybrané aspekty hodnotenia kvality životného prostredia. VII. Medzinárodná vedecká konferencia Vybrané aspekty integrovaného manažmentu životného prostredia. „Kultúra a životné prostredie“ (Selected aspects of environmental quality assessment. 7th International Scientific Conference - Selected Aspects of Integrated Environmental Management, "Culture and the environment"). Zvolen, 10.10. - 11.10. 2019.

SAXA, A., ČERNECKÝ, J. Monitoring a reporting cicavcov európskeho významu na Slovensku. Výskum a ochrana cicavcov na Slovensku. 14. celoštátna vedecká konferencia s medzinárodnou účasťou (Monitoring and reporting of mammals under the EU Habitats Directive. Research and protection of mammals in Slovakia. 14th National scientific conference with international participation). Banská Bystrica, 14.11. – 15. 11.2019.

URBAN, P., AMBROS, M., ČERNECKÝ, J., UHRIN, M. Červený zoznam cicavcov Slovenska. Výskum a ochrana cicavcov na Slovensku. 14. celoštátna vedecká konferencia s medzinárodnou účasťou (Red list of mammals of Slovakia. Research and protection of mammals in Slovakia. 14th National scientific conference with international participation). Banská Bystrica, 14.11. – 15. 11.2019.

HUTÁROVÁ, Daniela. Možnosti rozvoja cestovného ruchu v marginálnom regióne Gemer-Malohont. Interdisciplinárna vedecká konferencia Kultúrne dedičstvo Gemera a Malohontu VIII (Opportunities for tourism development in the marginal region of Gemer-Malohont. Interdisciplinary Scientific Conference - Cultural Heritage of Gemer and Malohont). Revúca, 8. – 9.9. 2020.

IZAKOVIČOVÁ, Zita. Krajinnoeologické plánovanie. Valné zhromaždenie SAPV (Landscape-ecological planning. General Assembly of Slovak Academy of Agricultural Sciences). Nitra. 8. september 2020.

HEGEDUŠOVÁ, K. – ŽARNOVIČAN, H. – KANKA, R. – ŠUVADA, R. – ROLEČEK, J.: Teplomilné dubiny na Slovensku, výsledok syntaxonomickej revízie. Vedecká konferencia ŠOP SR (Thermophilic oak forests in Slovakia, the result of syntaxonomic revision. Scientific conference of The State Nature Conservancy). Online, 24.11.2021.

2.3.11. List of researchers who served as members of organising and programme committees of national conferences

Peter Bezák - Spoločná poľnohospodárska politika po 2020: nová zelená architektúra, nové ekologické schémy a indikátory biodiverzity (The post-2020 Common Agricultural Policy: new green architecture, new ecological schemes and biodiversity indicators), programme/organising committee, Nitra, 2020

Stanislav David - Environmentálna výchova, vzdelávanie a osвета (Environmental education, training and awareness), organising committee, Nitra, 2018

Peter Gajdoš – XV. Arachnologická konferencia (XV. Arachnological Conference), organising committee, Východná, 2017

Peter Gajdoš – XVI. Arachnologická konferencia (XVI. Arachnological Conference), organising committee, Východná, 2018

Peter Gajdoš – XVII. Arachnologická konferencia (XVII. Arachnological Conference), programme-organising committee (chairman), Východná 2019

Peter Gajdoš – XVIII. Arachnologická konferencia (XVIII. Arachnological Conference), programme/organising committee (chairman), Východná, 2020

Peter Gajdoš – XIX. Arachnologická konferencia (XIX. Arachnological Conference), programme/organising committee, Východná, 2020

Zita Izakovičová - Ekosystémové služby v spoločnosti (Ecosystem services in society), programme committee, Trnava, 2016

Zita Izakovičová - Ekologické dni (Ecological days), scientific/programme/organising committee, Nitra, 2017

Zita Izakovičová - Prístupy a príklady hodnotenia ekosystémových služieb (Approaches and examples for ecosystem services valuation), programme/organizačný, committee, Radava, 2017

Zita Izakovičová - Environmentálna výchova, vzdelávanie a osвета (Environmental education, training and awareness), programme committee (guarantor), UKF Nitra, 2018

László Miklós - Konferencia 100 rokov štátnej ochrany prírody na Slovensku (Conference 100 years of state nature protection in Slovakia), programme committee (guarantor), Tále, 2019

Jana Špulerová - Prístupy a príklady hodnotenia ekosystémových služieb (Approaches and examples for ecosystem services valuation), programme/organising committee, Radava, 2017

2.3.12. List of researchers who received a national scientific award

Lieskovský Juraj

Cena Slovenskej akadémie vied pre mladého vedeckého pracovníka za koordináciu prestížneho projektu programu NASA Land-Cover/Land-Use Change Program (Award of the Slovak Academy of Sciences for a young researcher for the coordination of a prestigious project of the NASA Land-Cover / Land-Use Change Program: 200 years of land-use and land cover changes and their driving forces in the Carpathian Basin) (2016)

David Stanislav, Gajdoš Peter, Halada Ľuboš, Hreško Juraj

Diplom za 2. miesto knihy "Divočina pod Salatínom" v kategórii odbornej literatúry pre dospelých a pre deti a mládež súťaže o najkrajšiu knihu regiónu. Ocenenie udelil Žilinský samosprávny kraj a Liptovská knižnica Gašpara Fejérpataky-Belopotockého v Liptovskom Mikuláši (Diploma for the 2nd place of the book " Wilderness under Salatín Mt." in the category of professional literature for adults and for children and youth in the competition for the most beautiful book in the region. The award was given by the Žilina Self-governing Region and the Liptov Library of Gašpar Fejérpataky-Belopotocký in Liptovský Mikuláš) (2016)

Izakovičová Zita, Špulerová Jana, Štefunková Dagmar, Dobrovodská Marta a kol. (ďalší autori z ÚKE SAV/and other authors from Institute of Landscape Ecology of the Slovak Academy of

Sciences: Kenderessy Pavol, Vlachovičová Miriam, Lieskovský Juraj, Piscová Veronika, Kanka Róbert, Bača Andrej, Barančoková Mária, Bezák Peter, Bezáková Magdaléna, Boltižiar Martin, Mojses Matej, Dubcová Magdaléna, Gajdoš, Peter, Gerháťová, Katarína, Izsóff Martin, Kalivoda Henrik, Miklósová Viktória, Šatalová Barbora, Halabuk Andrej)

Ocenenie ministerky poľnohospodárstva a rozvoja vidieka SR "Zlatý kosák" za originálnu publikáciu Hodnotenie historických štruktúr poľnohospodárskej krajiny Slovenska v súťaži exponátov na Medzinárodnej poľnohospodárskej a potravinárskej výstave AGROKOMPLEX 2017 v Nitre ("Golden sickle" award of the Minister of Agriculture and Rural Development of the Slovak Republic for the original publication :Evaluation of historical structures of the agricultural landscape of Slovakia, in the competition of exhibits at the International Agricultural and Food Exhibition AGROKOMPLEX in Nitra) (2017)

Kozelová Ivana

Cena mladý ekológ udelená Slovenskou ekologickou spoločnosťou (Young Ecologist Award given by the Slovak Ecological Society) (2017)

Barančok Peter

Ocenenie za vedeckú publikáciu s mimoriadne vysokým počtom citácií udelené Predsedníctvom SAV za prácu (Award for a scientific publication with an exceptionally high number of citations awarded by the Presidency of the Slovak Academy of Sciences for:) Gottfried, M., Pauli, H., Futschik, A., Akhalkatsi, M., Barančok, P., et al., 2012: Continent-wide response of mountain vegetation to climate change. Nature Climate Change, vol. 2, No. 2, pp. 111-115. (2018)

Kanka Róbert

Ocenenie za vedeckú publikáciu s mimoriadne vysokým počtom citácií udelené Predsedníctvom SAV za prácu (Award for a scientific publication with an exceptionally high number of citations awarded by the Presidency of the Slovak Academy of Sciences for:) Bernhardt-Römermann, M., Gray, A., Vanbergen, A.J., Bergés, L., Böhner, A., Brooker, R.W., De Bruyn, L., De Cinti, B., Dirnböck, T., Grandin, U., Hester, A.J., Kanka, R., Klotz, S., Loucougaray, G., Lundin, L., Matteucci, G., Mészáros, I., Oláh, V., Preda, E., Prévosto, B., Pykälä, J., Schmidt, W., Taylor, M.E., Vadineanu, A., Waldmann, T., Stadler, J., 2011: Functional traits and local environment predict vegetation responses to disturbance: a pan-European multi-site experiment. Journal of Ecology, British Ecological Society, Vol. 99, No. 3, p. 780-791. (2018)

Kanka Róbert

Ocenenie za vedeckú publikáciu s mimoriadne vysokým počtom citácií udelené Predsedníctvom SAV za prácu (Award for a scientific publication with an exceptionally high number of citations awarded by the Presidency of the Slovak Academy of Sciences for:) Pauli, H., Gottfried, M., Dullinger, S., Abdaladze, O., Akhalkatsi, M., Benito Alonso, J.L., Coldea, G., Dick, J., Erschbamer, B., Calzado, R.F., Ghosn, D., Holten, J.I., Kanka, R., Kazakis, G., Kollár, J., Larsson, P., Moiseev, P., Moiseev, D., Molau, U., Mesa, J.M., Nagy, L., Pelino, G., Puşcaş, M., Rossi, G., Stanisci, A., Syverhuset, A.O., Theurillat, J.P., Tomaselli, M., Unterluggauer, P., Villar, L., Vittoz, P., Grabherr, G., 2012: Recent Plant Diversity Changes on Europe's Mountain Summits. SCIENCE Vol. 336, p. 353-355. (2018)

Klimantová Alexandra

Ocenenie: Mladý vedecký pracovník SAV do 35 rokov udelené Predsedníctvom SAV za 3 miesto v súťaži "Mladý vedecký pracovník SAV do 35 rokov (Award for 3rd place in the competition "Young Scientist of the Slovak Academy of Sciences under 35" awarded by the Presidium of the Slovak Academy of Sciences) (2018)

Kollár Jozef

Ocenenie Predsedníctva SAV za vedeckú publikáciu s mimoriadne vysokým počtom citácií za prácu (Award for a scientific publication with an exceptionally high number of citations awarded by the Presidency of the Slovak Academy of Sciences for:) Pauli, H., Gottfried, M., Dullinger, S., Abdaladze, O., Akhalkatsi, M., Benito Alonso, J.L., Coldea, G., Dick, J., Erschbamer, B., Calzado, R.F., Ghosn, D., Holten, J.I., Kanka, R., Kazakis, G., Kollár, J., Larsson, P., Moiseev, P., Moiseev, D., Molau, U., Mesa, J.M., Nagy, L., Pelino, G., Puşcaş, M., Rossi, G., Stanisci, A., Syverhuset, A.O., Theurillat, J.P., Tomaselli, M., Unterluggauer, P., Villar, L., Vittoz, P., Grabherr, G., 2012: Recent Plant Diversity Changes on Europe's Mountain Summits. SCIENCE Vol. 336, p. 353-355.

(2018)

Gajdoš Peter

Prémia SAV za vedeckú a odbornú literatúru za dielo Peter Gajdoš a kolektív: Pavúky Slovenska, Slovenské názvoslovie, prehľad čeľadí a súčasné poznatky, vydavateľstvo VEDA (The Slovak Academy of Sciences Award for Scientific and Professional Literature for the publication: Peter Gajdoš et al.: Spiders of Slovakia, Slovak Nomenclature, overview of families and current knowledge) (2019)

Izakovičová Zita

Medaila SAV za podporu vedy udelená Predsedom SAV za podporu vedy v SR (The Slovak Academy of Sciences Medal for Support of Science awarded by the President of the Slovak Academy of Sciences) (2019)

Lieskovský Juraj

Ocenenie Predsedníctva SAV za špičkovú časopiseckú publikáciu udelené publikácii (The Slovak Academy of Sciences Presidium Award for an excellent publication:) Wildlife population changes across Eastern Europe after the collapse of socialism, published in 2018 in Frontiers in Ecology and the Environment 16, 77–81. <https://doi.org/10.1002/fee.1770>. (2019)

Miklós László

Nummum Academiae Memorialem Tribuit pro singularibus meritis de studii scientiarum provehendis, Academia Scientiarum Slovaca udelené predsedom SAV za významný prínos a podporu vedy (awarded by the President of the Slovak Academy of Sciences for significant contribution to and support of science) (2019)

Oszlányi Július

Medaila SAV udelená za podporu vedy (The Slovak Academy of Sciences Medal awarded for support of science) (2019)

Oszlányi Július

Ocenenie: Významná osobnosť SAV udelené J. Oszlányimu za celoživotný prínos do rozvoja vedy (An Important Personality of the Slovak Academy of Sciences Award for lifelong contribution to the development of science) (2019)

Piscová Veronika et al.

Prémia SAV za vedeckú a odbornú literatúru za dielo Veronika Piscová a kol.: Využívanie vysokohorskej krajiny a jeho dôsledky na zmenu prostredia na príklade Tatier a Nízkych Tatier (The Slovak Academy of Sciences Award for Scientific and Professional Literature for publication: Veronika Piscová et al. – other authors from Institute of Landscape Ecology of the Slovak Academy of Sciences: T. Hrnčiarová, J. Hreško, M. Dobrovodská, Z. Izakovičová, H. Kalivoda, R. Kanka, P. Kenderessy, J. Špulerová, M. Vlachovičová, I. Borovský - The Landuse of Alpine Landscape and Its Consequences for Environmental Change on the Example of the Tatras and Low Tatras) (2019)

Izakovičová Zita

Jubilejná medaila Technickej Univerzity vo Zvolene udelená za podporu rozvoja Katedry UNESCO pre ekologické vedomie a trvalo udržateľný rozvoj Fakulty ekológie a environmentalistiky (Jubilee Medal of the Technical University in Zvolen awarded for supporting the development of the UNESCO Department of Environmental Science and Sustainable Development, Faculty of Ecology and Environmental Studies) (2019)

Izakovičová Zita

Pamätná medaila rektora UKF Nitra udelená pri príležitosti 60. výročia univerzity bola udelená za dlhoročnú spoluprácu (Commemorative medal of the Rector of Constantine the Philosopher University in Nitra awarded for long-term cooperation on the occasion of the 60th anniversary of the University) (2019)

Izakovičová Zita on behalf of the Institute of Landscape Ecology of the Slovak Academy of Sciences

Pamätný list a pamätná medaila generálneho riaditeľa ŠOP pri príležitosti 100 výročia ochrany

prírody na Slovensku boli udelené Ústavu krajinnej ekológie SAV za dlhoročnú spoluprácu (Commemorative letter and commemorative medal of the General Director of The State Nature Conservancy on the occasion of the 100th anniversary of nature protection in Slovakia for long-term cooperation) (2019)

Izakovičová Zita on behalf of the Institute of Landscape Ecology of the Slovak Academy of Sciences

Strieborná medaila Fakulty prírodných vied UKF v Nitre udelená ako prejav uznania za osobný prínos a podporu spolupráce medzi FPV UKF v Nitre a ÚKE SAV (Silver medal of the Faculty of Natural Sciences, Constantine the Philosopher University in Nitra awarded as an expression of recognition for personal contribution to and support of cooperation between the Faculty of Natural Sciences of Constantine the Philosopher University in Nitra and the Institute of Landscape Ecology of the Slovak Academy of Sciences) (2019)

Izakovičová Zita

Strieborná medaila SPU za mimoriadny prínos pre rozvoj vedy, vzdelávania a zásluhy o rozvoj spolupráce so Slovenskou poľnohospodárskou univerzitou v Nitre (Slovak University of Agriculture Silver Medal for extraordinary contribution to the development of science, education and cooperation with the Slovak University of Agriculture in Nitra) (2019)

Miklós László

Cena od prezidenta Slovenskej spoločnosti pre kvalitu udelená za mimoriadny prínos k rozvoju kvality (Award from the President of the Slovak Society for Quality awarded for extraordinary contribution to the development of quality) (2019)

Miklós László

Čestné uznanie od podpredsedu vlády a ministra životného prostredia SR udelené pri príležitosti 100 rokov štátnej ochrany prírody na Slovensku (Honorable mention from the Deputy Prime Minister and Minister of the Environment of the Slovak Republic awarded on the occasion of 100 years of state nature protection in Slovakia) (2019)

Miklós László

Jubilejná medaila Technickej univerzity vo Zvolene udelená rektorom za celoživotný prínos k rozvoju univerzity (Jubilee medal of the Technical University in Zvolen, awarded for lifelong contribution to the development of the University) (2019)

Miklós László

Pamätný list udelený riaditeľkou Slovenského múzea ochrany prírody a jaskyniarstva pri príležitosti 100. výročia štátnej ochrany prírody na Slovensku (Commemorative letter awarded by the director of the Slovak Museum of Nature Protection and Speleology on the occasion of the 100th anniversary of state nature protection in Slovakia) (2019)

Kenderessy Pavol, Lieskovský Juraj

Cena SAV za rok 2019 v kategórii "Publikácie s mimoriadne vysokým počtom citácií" za publikáciu (The Slovak Academy of Sciences Award in the category "Publications with an exceptionally high number of citations" for publication:) Lieskovský J., Kenderessy P. (2014). Modelling the effect of vegetation cover and different tillage practices on soil erosion in vineyards: a case study in Vráble (Slovakia) using WATEM/SEDEM. Land Degrad Dev 25:288–296. (2020)

Halada Ľuboš

Slovenská botanická spoločnosť udelila Ľubošovi Haladovi titul "Zaslúžilý člen". (The Slovak Botanical Society awarded Ľuboš Halada the title "Meritorious Member".) (2021)

Bolťižiar Martin

Pamätná plaketa Asociácie strážcov chránených území Slovenska za prínos v oblasti ochrany prírody a krajiny Slovenskej republiky a funkciu prezidenta asociácie (Commemorative plaque of the Association of Rangers of Protected Areas of Slovakia for contributions in the field of nature and landscape protection and the function of the president of the association) (2021)

Izakovičová Zita

Pamätná medaila Technickej univerzity vo Zvolene udelená za dlhoročnú spoluprácu a ako vyjadrenie vďaky za zásluhy o rozvoj fakulty (Commemorative medal of the Technical University in Zvolen awarded for long-term cooperation and as an expression of gratitude for the merits of the faculty development) (2021)

2.4. Research grants and other funding resources

(List type of project, title, grant number, duration, total funding and funding for the institute, responsible person in the institute and his/her status in the project, e.g. coordinator “C”, work package leader “W”, investigator “I”. Add information on the projects which are interdisciplinary, and also on the joint projects with several participating SAS institutes)

- **International projects and funding**

2.4.1 List of major projects of Framework Programmes of the EU (which pillar), NATO, COST, etc.

Horizon 2020, 7th framework programme:

ELTER PPP - Elter Preparatory Phase Project

Grant number: 871126

Programme: Horizon 2020

Principal investigator from ILE SAS: RNDr. Halada Ľuboš CSc.

Coordinator: Umweltforschung GmbH Leipzig, Germany

Partners: 22 research institutions from Europe and Izrael

Funding: 6023 € (MVTs)

Duration: 1. 2. 2020 - 31. 1. 2025

ELTER PLUS - European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS

Grant number: 871128

Programme: Horizon 2020

Principal investigator from ILE SAS: RNDr. Halada Ľuboš CSc.

Coordinator: University of Helsinki – Helsinki, Finland

Partners: 22 research institutions from Europe and Izrael

Funding: 8433 € (MVTs)

Duration: 1. 2. 2020 - 31. 1. 2025

INSPIRATION – Integrated Spatial Planning, land use and soil management Research AcTION

Grant number: Grant Agreement No. 642372

Programme: Horizon 2020

Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.

Coordinator: Umweltbundesamt, Germany

Partners: 9 research institutions from Europe

Funding: 10064 € (MVTs)

Duration: 1.3.2015 – 28.2.2018

Advance eLTER – Advancing the European Long-Term Ecosystem, critical zone and socio-ecological Research Infrastructure towards ESFRI

Grant number: 739558

Programme: Horizon 2020

Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.

Coordinator: Helmholtz-Zentrum für Umweltforschung GmbH - UFZ

Partners: 24 research institutions from Europe

Funding: 823 € (European Commission)
Duration: 1.1.2017 – 31.12.2017

eLTER – European Long-Term Ecosystem and Socio-Ecological Research Infrastructure
Grant number: 654359
Programme: Horizon 2020
Funding: 11033 € (European Commission), 23231 € (MVTs)
Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.
Coordinator: UMWELTBUNDESAMT GMBH (EAA)
Partners: 24 research institutions from Europe
Duration: 1.6.2015 – 31.5.2019

OpenNESS – Operationalisation of Natural Capital and EcoSystem Services: From Concepts to Real-world Applications (OpenNESS)
Grant number: 308 428
Programme: 7FP
Funding: 118368 € (European Commission), 38465 € (MVTs)
Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.
Coordinator: SYKE, Finland
Partners: 19 research institution from Europe, Africa, Asia, South America
Duration: 1.12.2012 – 31.5.2017

International Visegrad Fund (IVF):

Linking Science, Policy and People for Sustainable Carpathians
Grant number: 21930321
Principal investigator from ILE SAS: RNDr. Halada Ľuboš CSc.
Coordinator: Ústav výzkumu globální změny Akademie věd České republiky, Czech Republic
Duration: 1. 3. 2020 - 31. 7. 2022

COST

Optical synergies for spatiotemporal sensing of scalable ecophysiological traits
Grant number: CA17134
Principal investigator from ILE SAS: Mgr. Halabuk Andrej PhD.
Coordinator: Luxembourg Institute of Science and Technology (LIST)
Partners: Wageningen University and Research, Netherland; Image Processing Laboratory (IPL) University of Valencia, Spain; University of Zurich, Switzerland
Funding: 10578 € (MVTs)
Duration: 4. 5. 2018 - 23. 10. 2022

Process-based models for climate impact attribution across sectors
Grant number: CA19139
Principal investigator from ILE SAS: Dr.nat.techn. Ing. Merganičová Katarína PhD.
Coordinator: Potsdam Institute for Climate Impact Research, Germany
Partners: Czech University of Life sciences Prague, Czech Republic; Potsdam Institute for Climate Impact Research - Potsdam, Climate Analytics – Berlin, Germany; National Institute of Health – Porto, Portugal; Università degli Studi della Basilicata – Potenza, Italy; University of Nottingham School of Geography, University of Nottingham, United Kingdom
Duration: 27. 10. 2020 - 26. 10. 2024

SENSFOR – Enhancing the resilience capacity of SENSitive mountain FORest ecosystems under environmental change (SENSFOR)
Grant number: ESSEM COST Action ES1203
Principal investigator from ILE SAS: Mgr. Kollár Jozef, PhD.
Coordinator: University of Oulu Thule Institute, Finland
Partners: 10 research institutes from Europe
Duration: 1.1.2013 – 21.11.2016

European Space Agency (ESA)

Sen2ForMaM – Sentinel 2 based support of forest disturbance mapping and monitoring

Principal investigator from ILE SAS: Mgr. Halabuk Andrej, PhD.

Coordinator: Software laboratory YMS, Inc.

Funding: 14746 € (ESA), 7553 € (MVTs)

Duration: 1.1.2019 – 31.12.2020

European Regional Development Fund (ERDF)

DREAM SK-AT - Danube River Research and Management in Slovakia and Austria

Grant number: 305011Q988

Principal investigator from ILE SAS: Mgr. Kenderessy Pavol PhD.

Coordinator: Universität für Bodenkultur Wien (BOKU), Austria

Partner: Research Institute of Water Management (VÚVH), Slovakia

Funding: 213055 € (ERDF), 16827 € (MVTs)

Duration: 1. 1. 2016 - 31. 12. 2022

Multilateral other:

Landscape Europe

Grant number: 247

Coordinator: Mgr. Bezák Peter, PhD.

Partners: 20 research institution from Europe

Funding: 40640 € (Landscape Europe network)

Duration: 1.1.2011 – 31.12.2018

NEEMO EEIG 2019 - Inter-institutional single framework contract for the provision of support for the monitoring of LIFE projects, communication about the LIFE programme and other related activities

Principal investigator from ILE SAS: Mgr. Bezák Peter PhD.

Coordinator: NEEMO EWIV, Freiburg, Germany

Partners: DAI, United Kingdom; Prospect, AEIDL, Belgium; Oréade-Brèche, France; ELLE, Latvia; IDOM, Spain; Timesis, Italy

Funding: 2125107 € (DG – Environment, EASME CINEA)

Duration: 1. 1. 2019 - 31. 12. 2022

NEEMO – Monitoring of LIFE projects (action grants and operating grants), communication about the LIFE programme and other linked activities- NEEMO EEIG

Principal investigator from ILE SAS: Ing. Oszlányi Július, CSc.

Coordinator: NEEMO EWIV, Freiburg, Germany

Partners: 7 institutions from 7 European countries

Funding: 2574615 € (DG-Environment, EASME CINEA)

Duration: 1.1.2015 – 31.12.2018

NBP – Support for the Natura 2000 Biogeographical Process

Grant number: 0248

Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.

Coordinator: European Centre for Nature Conservation, Netherlands

Partners: European Landowner's Organization (ELO), Belgium; Eurosite, Netherlands; CEEweb for Biodiversity, Hungary; EUROPARC Federation, Germany

Funding: 59101 € (European Commission)

Duration: 1.1.2015 – 31.12.2017

Synthesis of Studies on Institutional Change and LCLUC Effects on Carbon, Biodiversity, and Agriculture After the Collapse of the Soviet Union

Grant number: NNH10ZDA001

Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.

Coordinator: University of Wisconsin - Madison
Partners: 10 research institution from 7 countries of Europe, North America and Asia
Duration: 1.1.2013 – 31.12.2016

Bilateral-other:

REGATA - Atmospheric Deposition of Heavy Metals in Industrial Areas of Slovakia Studied by the Moss Biomonitoring Technique Employing Nuclear and Related Analytical Techniques and GIS Technology

Grant number: FLNP JINR № 03-4-1128-2017/2022
Principal investigator from ILE SAS: RNDr. Borovská Jana PhD.
Coordinator: Joint Institute for Nuclear Research, Dubna, Russia
Funding: 3109 € (MVTs)
Duration: 1. 11. 2020 - 31. 12. 2022

ETC BD – European Topic Centre on Biological Diversity – 2019-2021

Grant number: 3333/B2019/EEA.57531
Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc
Coordinator: Museum National d'Histoire Naturelle, Paris
Partners: 10 research institutes from Europe
Funding: 61869 € (Museum National d'Histoire Naturelle, Paris), 7237 (MVTs)
Duration: 1.1.2019 – 31.12.2021

ETC BD – European Topic Centre on Biological Diversity

Grant number: 0276
Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.
Coordinator: Museum National d'Histoire Naturelle, France
Partners: 9 research institutes from Europe
Funding: 72223 € (European Environmental Agency), 12050 (MVTs)
Duration: 1.1.2014 – 31.12.2018

Mobilisation of Emerald Network databases in the Western Balkans in preparation of biogeographical seminars

Grant number: 3437/R0-IPA2020/EEA.58820
Principal investigator from ILE SAS: RNDr. Halada Ľuboš CSc.
Coordinator: Umweltbundesamt GmbH, Vienna, Austria
Duration: 22. 12. 2021 - 30. 6. 2022

Other:

ENI-SEIS II – Support for the implementation of the ENI-SEIS II East 2019 Regional and National Work Plan in assisting reporting to Emerald Network

Grant number: 0296
Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.
Coordinator: Museum National d'Histoire Naturelle Paris, France
Duration: 1.4.2019 – 31.12.2019

ENI_SEIS – Support for the implementation of the ENI-SEIS II East 2017-2018 Regional and National Work Plan in assisting reporting to Emerald Network

Grant number: 3437/B2017/ENIE/EEA.56933
Principal investigator from ILE SAS: RNDr. Halada Ľuboš, CSc.
Coordinator: Museum National d'Histoire Naturelle Paris, France
Partners: EUREKO b.v.b.a., Belgium
Funding: 25715 € (European Environmental Agency)
Duration: 1.7.2017 – 30.11.2018

Add information on your activities in international networks

The Institute of Landscape Ecology, Slovak Academy of Sciences (ILE SAS) acts as an expert workplace of the European Commission in Brussels in the field of environment, nature protection and biodiversity. ILE SAS regularly assesses for Directorate-General for Environment (DG ENV) and for European Climate Infrastructure and Environment Executive Agency (CINEA) the results of LIFE projects in six countries (Czech Republic, Poland, Slovakia, Hungary, Romania and Croatia) and monitor their implementation from technical and financial point of view. Having expertise since 2005, the Institute continues with this work in the running contract for 2019-2022.

ILE SAS is a member of the consortium of the European Topic Centre on Biological Diversity and since 2001 it has participated in professional activities on behalf of the European Environment Agency in Copenhagen in the field of nature conservation. After 17 years of expertise, the ILE SAS also retained this position for the years 2019-2022, providing scientific expert reports related to ecosystems, habitats, plant and animal species in Europe.

The Institute was one of the founding organizations of the "Science for Carpathians network" and participates in its management (Ľ. Halada).

The Institute is still in the European Commission Network of Excellence with the project "A Long-Term Biodiversity, Ecosystem and Awareness Research Network II" (Alter-net II) (R. Kanka).

ILE SAS was the main coordinator and secretariat of Landscape Europe in the period of 2011-2018. Landscape Europe was an interdisciplinary network of national research institutions with experience in landscape evaluation, planning, management in politics and education as well as development of science and the arts to support sustainable landscape development. There were 20 research institutions from 15 European countries in the network, its activity was terminated in 2020 (P. Bezák).

ILE SAS participates in the worldwide initiative "International Cooperative Programme on Effects of Air Pollution on Natural Vegetation and Crops" (ICP Vegetation) of the *United Nations Economic Commission for Europe (UNECE)* (Ľ. Halada, J. Borovská) through monitoring and evaluation of the current state of heavy metal pollution in Slovakia (REGATA project). The results will be published in the Atlas of Atmospheric Storage of Heavy Metals in Europe 2020-2022.

ILE SAS contributed to an open letter addressed from scientists to politicians (in the form of an open publication). The information was distributed to all policy-makers at EU- and at national level who may influence future agricultural policy (P. Bezák).

ILE SAS scientists P. Bezák, J. Špulerová, Ľ. Halada initiated and conducted a questionnaire survey and online workshop on the impact of the existing proposal of Common Agricultural Policy (CAP) 2023-2027 on biodiversity and the landscape. The results were sent to policy makers as well as the international scientific community. The leaders of the initiative are German Centre for Integrative Biodiversity Research and Helmholtz Centre for Environmental Research (iDiv / UFZ) in Germany.

The employees of the ILE SAS are representatives of Slovakia in the following:

- Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) (Z. Izakovičová, J. Špulerová).
- The European Strategy Forum on Research Infrastructures (ESFRI), and the ESFRI project for biodiversity research LIFEWATCH ERIC (Ľ. Halada on behalf of the Ministry of Education, Science, Research and Sport of the Slovak Republic)
- International Long -Term Ecological Research (ILTER), Long-Term Ecosystem Research in Europe (LTER – Europe) (Ľ. Halada).
- International Coordination Committee of the UNESCO Man and the Biosphere Programme (J. Oszlányi, 2015-2019).
- European Academies Science Advisory Council - Environment Steering Panel (EASAC - ESP) (J. Oszlányi until 2019).
- Worldwide network for the study of global changes "Future Earth" (J. Oszlányi until 2020, I. Kozelová since 2021).
- European Alliance for Global Change (Z. Izakovičová),

The employees of the ILE SAS are members of the following:

- European Academy of Sciences and Arts in Salzburg (Z. Izakovičová, L. Miklós, J. Oszlányi).
- Commission for the Coordination of Activities of the Slovak Republic in ESFRI research infrastructures in the field of health, food and the environment (advisory body of the Minister of Education) (L. Halada)
- Plenum of the Slovak Commission for UNESCO, which is an advisory body to the Government of the Slovak Republic (L. Miklós)
- Slovak Committee of the Man and the Biosphere Programme (MaB) at the Ministry of Foreign and European affairs of the Slovak Republic (V. Piscová). The UNESCO Man and the Biosphere (MAB) program has relaunched its World Network of Mountain Biosphere Reserves in an effort to improve the protection of mountain ecosystems and the livelihoods of mountain communities, with Slovakia among those participating.
- National Committee of the Future Earth (Z. Izakovičová, P. Bezák).
- Slovak working group for cooperation with the International Institute for Applied Systems Analysis (Z. Izakovičová)
- Committee of the European Ecological Federation (Z. Izakovičová)
- The international network of the European Cultural and Agricultural Landscapes (EucaLand), within which they deal with the analysis and typification of historical agricultural landscapes in Europe (J. Špulerová, M. Dobrovodská, D. Štefunková).
- Management committee for Slovakia in the research network of the project - Optical synergies for spatiotemporal sensing of scalable ecophysiological traits (COST Action 17134) (A. Halabuk - since 2018)

Other activities:

ILE SAS employee L. Miklós worked on the project “Dynamic mapping and service for regional ecological civilization based on big data” (DMSRCC), run by Nanjing Normal University in China as a “high level foreign expert.” The project was funded by the Ministry of Science and Technology of China.

- ILE SAS employee R. Kanka accompanied Prince Albert the Second, Prince of Monaco during his visit to Slovakia.

- **National projects and their funding, incl. international projects with only national funding**

2.4.2. List of ERA-NET projects funded from SAS budget

CLIMASTEPPPE – Riešenia pre klimaticky vhodné poľnohospodárstvo v suchých stepných oblastiach Ruska

Solutions for climate-smart land use in the dry steppes of Russia

Principal investigator from ILE SAS: Mgr. Lieskovský Juraj, PhD.

Coordinator: Institute of Steppe of the Ural Branch of the Russian Academy of Sciences

Partners: Potsdam Institute for Climate Impact Research, Germany; Swiss Federal Institute for Forest Snow and Landscape Research WSL, Switzerland, Geographical Institute, Slovak Academy of Sciences

Funding: MVTs 28196 €

Duration: 1.4.2018 – 31.3.2021

2.4.3. List of projects of the Slovak Research and Development Agency (APVV)

DEMETERA - Hodnotenie novodobých zmien a vývojových trendov poľnohospodárskej krajiny Slovenska

DEMETERA - Assessment of recent changes and trends in agricultural landscape of Slovakia

Coordinator: RNDr. Halada Ľuboš CSc.

Partner: Faculty of Natural Sciences, University of Constantine the Philosopher Nitra

Funding: APVV 121348 €
Duration: 1. 8. 2018 - 30. 6. 2022

Implementácia Agendy 2030 prostredníctvom biosférických rezervácií
Implementation of Agenda 2030 through biosphere reserves
Principal investigator from ILE SAS: Mgr. Piscová Veronika PhD.
Coordinator: Matej Bel University in Banská Bystrica - Faculty of Economics
Funding: APVV 32623 €
Duration: 1. 7. 2021 - 30. 6. 2025

Nové možnosti využitia odvodňovacích kanálových sústav s ohľadom na ochranu a využívanie krajiny
New possibilities of use of drainage canal systems with taking into account the protection and use of a landscape
Principal investigator from ILE SAS: Mgr. Kalivoda Henrik, PhD.
Coordinator: Water Management Research Institute
Partners: Institute of Hydrology of the Slovak Academy of Sciences, Faculty of Civil Engineering STU in Bratislava
Funding: APVV 51913 €
Duration: 1.7.2015 – 28.6.2019

EcoServ CL – Hodnotenie funkcií a služieb ekosystémov kultúrnej krajiny
Evaluation of ecosystem functions and services of the cultural landscape
Coordinator: RNDr. Kanka Róbert, PhD.
Partner: Faculty of Natural Sciences, Comenius University, Bratislava, Department of Soil Science
Funding: APVV 113015 €
Duration: 1.10.2013 – 30.9.2017

2.4.4. List of projects of the Scientific Grant Agency of the Slovak Academy of Sciences and the Ministry of Education (VEGA)

Diverzita lúčnych a pasienkových biotopov Slovenska po dvoch dekádach v Európskej únii
Diversity of grassland habitats in Slovakia after two decades in the EU
Principal investigator from ILE SAS: Ing. Špulerová Jana PhD.
Coordinator: Center for Plant Biology and Biodiversity SAS
Funding: VEGA 1300 €
Duration: 1. 1. 2021 - 31. 12. 2024

Dlhodobé zmeny znečistenia ovzdušia a ich dopad na ekosystémy
Long-term changes of atmospheric pollution and their impact to ecosystems
Coordinator: RNDr. Halada Ľuboš CSc.
Funding: VEGA 10828 €
Duration: 1. 1. 2021 - 31. 12. 2024

Ekologické analýzy akulturácie krajiny Slovenska od mladšieho praveku dodnes
Ecological Analyses of Landscape Acculturation in Slovakia since Early Prehistory until Today
Coordinator: Mgr. Piscová Veronika PhD.
Partner: Department of Archeology, Faculty of Arts, Constantine the Philosopher University in Nitra
Funding: VEGA 51042 €
Duration: 1. 1. 2019 - 31. 12. 2022

Ekologické vzťahy v systéme hostiteľ-parazitoid
Ecological relationships in the system host-parasitoid
Principal investigator from ILE SAS: RNDr. Gajdoš Peter CSc.
Coordinator: Institute of Forest Ecology SAS
Duration: 1. 1. 2020 - 31. 12. 2023
Funding: VEGA 5200 €

ECOTOUR - Integrácia poskytovania vybraných služieb ekosystémov pre spoločenský dopyt z hľadiska rozvoja udržateľných foriem cestovného ruchu
ECOTOUR - Integration of supply of selected ecosystem services for societal demand in terms of developing sustainable forms of tourism
Coordinator: RNDr. Krnáčová Zdena PhD.
Funding: VEGA 3731 €
Duration: 1. 1. 2021 - 12. 12. 2023

Krajinnoekologické aspekty zelenej a modrej infraštruktúry pri tvorbe optimálneho priestorového základu ekologicky stabilných plôch v urbanizovanej krajine
Landscape-ecological aspects of green and blue infrastructure in creation of an optimal spatial basis for ecologically stable areas in urban landscape
Coordinator: RNDr. Moyzeová Milena PhD.
Funding: VEGA 6215 €
Duration: 1. 1. 2021 - 31. 12. 2024

Vývoj pôdnych vlastností a vegetácie na bývalej poľnohospodárskej pôde
Evolution of soil properties and vegetation on the former agricultural land
Coordinator: Mgr. Kollár Jozef PhD.
Duration: 1. 1. 2021 - 31. 12. 2024
Funding: VEGA 4852 €

Historické a súčasné zmeny krajinnej diverzity a biodiverzity vplyvom pôsobenia prírodných a antropogénnych faktorov
Historical and present changes in the landscape diversity and biodiversity caused by natural and anthropogenic factors
Coordinator: RNDr. Barančok Peter, CSc.
Funding: VEGA 30083 €
Duration: 1.1.2018 – 31.12.2021

Výskum biokultúrnych hodnôt krajiny
Research of biocultural values of landscape
Coordinator: RNDr. Dobrovodská Marta, PhD.
Funding: VEGA 81142 €
Duration: 1.1.2018 – 31.12.2021

Hodnotenie transformácie prírodnej a sociálnokultúrnej diverzity kultúrnej krajiny Slovenska (na príklade vybraných území)
Evaluation of the transformation of natural and socio-cultural diversity of the cultural landscape in Slovakia (on example of selected areas)
Main investigator from ILE SAS: Ing. Štefunková Dagmar, PhD.
Coordinator: RNDr. Ján Hanušin, CSc., Geographical institute of SAS
Funding: VEGA 2422 €
Duration: 1.1.2018 – 31.12.2020

Zmeny pôdnych vlastností a sekundárna sukcesia po zalesnení bývalých poľnohospodárskych pôd
Changes in soil properties and secondary succession following afforestation of former agricultural land
Coordinator: Mgr. Kollár Jozef, PhD.
Partner: Faculty of Science, Comenius University, Bratislava, Department of Soil Science
Funding: VEGA 14585 €
Duration: 1.1.2018 – 31.12.2020

ECOMODELTUR – Hodnotenie kultúrnych ekosystémových služieb krajiny na báze krajinnoekologických výskumov pre ekologické modely rozvoja cestovného ruchu
ECOMODELTUR – The evaluation of cultural ecosystem services countries on a basis of landscape research for the ecological model of tourism development

Coordinator: RNDr. Zdena Krnáčová, PhD.
Funding: VEGA 19655 €
Duration: 1.1.2017 – 31.12.2019

Zmeny poľnohospodárskej krajiny Slovenska vplyvom politík Európskej Únie
Changes in Slovak Landscape Driven by European Union Agricultural Policy

Coordinator: Mgr. Lieskovský Juraj, PhD.
Funding: VEGA 89204 €
Duration: 1.1.2016 – 31.12.2019

Ekologická optimalizácia využívania zosuvných území vo vybraných častiach flyšového pásma, so zreteľom na ich tradičné obhospodarovanie

Ecological optimization of the utilization of landslide areas in selected parts of the flysch zone in regard to the traditional farming

Coordinator: RNDr. Barančoková Mária, PhD.
Funding: VEGA 10394 €
Duration: 1.1.2015 – 31.12.2018

Zelená infraštruktúra Slovenska
Green Infrastructure of Slovakia

Coordinator: RNDr. Moyzeová Milena, PhD.
Funding: VEGA 33782 €
Duration: 1.1.2015 – 31.12.2018

Analýza časovo-priestorovej dynamiky vybraných štruktúr kultúrnej krajiny Slovenska, ich ochrana a udržateľné využívanie

Analysis of temporal-spatial dynamics of the selected cultural landscape structures in Slovakia, their protection and sustainable use

Main investigator from ILE SAS: Ing. Štefunková Dagmar, PhD.
Coordinator: RNDr. Ján Hanušin, CSc., Geografický ústav SAV
Funding: VEGA 1720 €
Duration: 1.1.2015 – 31.12.2017

Diverzita poľnohospodárskej krajiny a jej ekosystémové služby
Diversity of agricultural landscape and its ecosystem services

Coordinator: Ing. Špulerová Jana, PhD.
Funding: VEGA 43974 €
Duration: 1.1.2014 – 31.12.2017

Dlhodobé zmeny vybraných parametrov pôd a ich ekosystémových služieb v závislosti od rôznych foriem využitia krajiny.

Long-term changes of selected soil properties and their ecosystem services depending on the different forms and intensity of agricultural land cultivation.

Coordinator: Mgr. Kenderessy Pavol, PhD.
Funding: VEGA 6809 €
Duration: 1.1.2015 – 31.12.2017

Lesná vegetácia a zmena pôdných vlastností na bývalej poľnohospodárskej pôde
Forest vegetation and changes in soil properties on the former agricultural land

Coordinator: Mgr. Kollár Jozef, PhD.
Partner: Faculty of Science, Comenius University, Bratislava, Department of Soil Science
Funding: VEGA 10093 €
Duration: 1.1.2015 – 31.12.2017

Priestorové a časové trendy akumulácie ťažkých kovov a dusíka v machoch na Slovensku za 25 rokov

Spatial and Time Trends of Accumulation of Heavy Metals and Nitrogen in Mosses in Slovakia in 25 years

Coordinator: Ing. Maňkovská Blanka, DrSc.
Funding: VEGA 26244 €
Duration: 1.1.2014 – 31.12.2017

Aktuálne využívanie vysokohorskej krajiny, jeho dôsledky na zmenu prostredia a hodnotenie únosnosti vybraných národných parkov Slovenska

Current utilization of high mountain landscape, its impacts on change of environment and assessment of carrying capacity of selected national parks of Slovakia

Coordinator: Mgr. Píscová Veronika, PhD.

Funding: VEGA 25826 €

Duration: 1.1.2013 – 31.12.2016

EKOMODEL – Ekologický model rozvoja cestovného ruchu na základe hodnotenia lokalizačných a realizačných predpokladov krajiny s využitím nástrojov GIS a kvantifikačných metód.

The ecological model of tourism development based on assessment of localization and realization assumptions of landscape with use of GIS tools and quantitation methods

Coordinator: RNDr. Krnáčová Zdena, PhD.

Partner: Faculty of Science UK Bratislava, Department of Landscape Ecology

Funding: VEGA 18387 €

Duration: 1.1.2014 – 31.12.2016

Hodnotenie stavu a dynamiky biotopov s využitím modelovania a diaľkového prieskumu Zeme
Assessment of status and dynamics of habitats using combination of modelling and remote sensing

Coordinator: RNDr. Halada Ľuboš, CSc.

Funding: VEGA 55375 €

Duration: 1.1.2013 – 31.12.2016

Synekologické špecifiká v diverzite a dynamike entomofauny borovicových porastov (*Pinus sylvestris*) na Borskej nížine.

Synecological specifics in diversity and dynamics of pine plantations (Pinus sylvestris) entomofauna on the Borská nížina lowland.

Principal investigator from ILE SAS: Mgr. Kalivoda Henrik, PhD.

Coordinator: Department of Zoology, Faculty of Natural Sciences, Comenius University Bratislava

Funding: VEGA 7566 €

Duration: 1.1.2013 – 31.12.2016

2.4.5. List of projects supported by EU Structural Funds

URANOS - Údajová a vedomostná podpora pre systémy rozhodovania a strategického plánovania v oblasti adaptácie poľnohospodárskej krajiny na klimatické zmeny a minimalizáciu degradácie poľnohospodárskych pôd

URANOS - Scientific Support of Climate Change Adaptation in Agriculture and Mitigation of Soil Degradation.

Coordinator: Mgr. Halabuk Andrej PhD.

Partners: National Agricultural and Food Centre (NPPC), Slovak University of Agriculture Nitra (SPU), University of Constantine the Philosopher Nitra (UKF), Slovak Hydrometeorological Institute (SHMÚ), Software laboratory YMS, Inc.

Funding: EU structural funds Research and development 49763 €

Duration: 3. 4. 2020 - 30. 6. 2023

Hodnotenie zmien krajiny a ich dopadov na životné prostredie

Assessment of landscape changes and their environmental impacts

Zodpovedný riešiteľ: Mgr. Kalivoda Henrik, PhD.

Funding: EU structural funds Research and development 1791146 €

Duration: 31.12.2019 – 31.3.2020

2.4.6. List of other projects funded from national resources

Rýchlostná cesta R1 – Primerané posúdenie vplyvov na územia Natura 2000
Expressway R1 – Appropriate Impact Assessment on the territories of Natura 2000
Coordinator: RNDr. Barančok Peter, CSc.
Funding: National Motorway Company Inc. 46583 €
Duration: 1.1.2017 – 30.6.2019

2.4.7. List of projects funded from private funds

Vypracovanie automatizovaného podporného systému na spracovanie dokumentácie Miestneho územného systému ekologickej stability (MÚSES)
Development of an automated support system for processing of documentation of LTSES (Local Territorial System of Ecological Stability)
Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.
Coordinator: Microcomp Ltd.
Funding: Microcomp Ltd. 105000 €
Duration: 1.1.2021 – 31.12.2021

EX-ANTE HODNOTENIE A SEA PRE STRATEGICKÝ PLÁN SPP 2021-2027
Ex post evaluation of the Rural Development Program for the period 2021-2027
Principal investigator from ILE SAS: RNDr. Miklósová Viktória PhD.
Funding: PROUNION Inc. 20000 €
Coordinator: PROUNION Inc.
Duration: 1. 6. 2019 - 31. 12. 2022

Návrh algoritmov pre jednotlivé časti dokumentov Miestneho územného systému ekologickej stability (MÚSES)
Proposals of an algorithm for the individual parts of the documentation of LTSES (Local Territorial System of Ecological Stability)
Principal investigator from ILE SAS: Dr.h.c. Prof. RNDr. Miklós László, DrSc.
Coordinator: Microcomp Ltd.
Funding: Microcomp Ltd. 105000 €
Duration: 1.6.2020 – 31.12.2020

Metodika na automatizované generovanie dokumentov Miestneho územného systému ekologickej stability (MÚSES)
Methodology for automated generation of documents on the Local Territorial System of Ecological Stability (LTSES)
Principal investigator from ILE SAS: Dr.h.c. Prof. RNDr. Miklós László, DrSc.
Coordinator: Microcomp Ltd.
Funding: Microcomp Ltd. 120000 €
Duration: 7.1.2020 – 15.2.2020

RÚSES – Regionálny územný systém ekologickej stability okresov Bratislava, Trnava, Malacky, Pezinok, Gelnica
Regional Territorial Systems of Ecological Stability – districts of Bratislava, Trnava, Malacky, Pezinok, Gelnica
Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.
Coordinator: Esprit Ltd.
Funding: Esprit Ltd. 30832 €
Duration: 1.1.2018 – 31.12.2020

Spracovanie miestneho územného systému ekologickej stability (MÚSES) Dolný Lopašov
Elaboration of Territorial System of Ecological Stability of Dolný Lopašov
Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.
Coordinator: Microcomp Ltd.
Duration: 1.2.2020 – 30.11.2020
Funding: Microcomp Ltd. 15000 €

Nezávislé hodnotenie Programu rozvoja vidieka SR pre obdobie 2014-2020
Independent evaluation of the Rural Development Programme for the period 2014-2020
Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.
Coordinator: PROUNION, Inc.
Funding: PROUNION Inc.: 16758 €
Duration: 18.12.2015 – 31.12.2019

Ex post – Ex-post hodnotenie Programu rozvoja vidieka SR pre obdobie 2007-2013
Ex post evaluation of the Rural Development Program for the period 2007-2013
Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.
Coordinator: PROUNION Inc.
Duration: 18.12.2015 – 31.12.2016
Funding: PROUNION Inc.: 10000 €

2.4.8. List of projects funded from other competitive funds

-

2.5. PhD studies and educational activities

2.5.1. List of accredited programmes of doctoral studies, period of validity, source of funding

As an external educational institution, ILE SAS participates in the implementation of the doctoral study programme 1610 - Ecological and Environmental Sciences with the cooperation of Constantin the Philosopher University Nitra. The study programme is valid according to the list of Ministry of Education, Science, Research and Sport (MŠVVaŠ) since September 1, 2019.

The previous study programme - 4.3.1 Landscape protection and landscape utilisation – Environmental studies was valid until September 1, 2019. Students can study this programme until 31.8. 2023.

In 2019-2022 we prepared and concluded a framework agreement with the Faculty of Natural Sciences of Comenius University Bratislava regarding participation in the provision of PhD studies in the field of Soil Ecophysiology and Environmental Soil Science.

The length of the study program, whether internal or external, is four years. The basic obligation of a doctoral student is to carry out the study, pedagogical and scientific activities according to the conditions defined by the cooperating universities, and also according to the terms of the ILE SAS Action Plan in the section Doctoral Studies

The qualification structure of our scientific researchers also establishes the conditions for successful implementation of the PhD study in ILE SAS.

2.5.2. Summary table on doctoral studies (number of internal/external PhD students at the end of the year; number of foreign PhD students, number of students who successfully completed their theses during the year, number of PhD students who quit the programme during the year)

PhD study	2016			2017			2018			2019			2020			2021		
Number of potential PhD supervisors																		
PhD students	number, end of year	defended thesis	students quitted	number, end of year	defended thesis	students quitted	number, end of year	defended thesis	students quitted	number, end of year	defended thesis	students quitted	number, end of year	defended thesis	students quitted	number, end of year	defended thesis	students quitted
Internal total	9	1	0	8	1	2	10	2	1	11	3	0	13	1	0	12	3	1
from which foreign citizens	0	0	0	0	0	0	2	0	0	2	0	0	2	1	0	1	0	1
External	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	1	0	0
Other supervised by the research employees of the institute	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	1	1	0

We trained 26 PhD. students during this accreditation period, of which 24 were internal and 2 external. We had two foreign students in this period, from Ukraine and Serbia. In the years 2016-2021 we admitted 14 internal and 3 external PhD. Students. 12 PhD students graduated after the defense of their dissertation thesis.

Internships of foreign PhD students, postdocs and researchers at ILE SAS:

Juan José Vidal Macua, PhD student, Universitat Autònoma de Barcelona (Španielsko). An internship was granted by Ministry of Economic Affairs and Digital Transformation of Spain (May – July, 2016). Theme: Land cover changes in the context of climate change. The supervisor was L. Halada.

Dr. Eng. Barbara Mastalska–Cetera, Dr. Eng. Beata Warczewska (September 5 to November 28, 2016 both) and PhD. student Mgr. inž. Monika Płuciennik (May 10 to July 10, 2016). They were admitted under a contract on cooperation between the Department of Land Management, Wrocław University of Environmental and Life Sciences, Wrocław (Poland) and the Institute of Landscape Ecology SAS. The supervisor was P. Barančok.

Mgr. inž. Małgorzata Świąder, PhD. Student, Department of Land Management, Wrocław University of Environmental and Life Sciences, Wrocław, Poland (June 23 to September 22, 2016). Her stay was financed by Erasmus. The supervisor was Z. Izakovičová.

Ing. Martina Urbanová, PhD. Student, Department of Applied and Landscape Ecology, Mendel University in Brno, Czech Republic (June 2019). Her stay was financed by Erasmus+. The supervisor was T. Hrnčiarová

Fatemeh Bahreini, PhD., scientist from the Research Institute of Forests and Rangelands, Boushehr, Iran. The fellowship in ILE SAS, funded by the National Fellowship Programme of the Slovak Republic (administered by SAIA), started in 1.2.2021 (duration 10 months). The main purpose of the trainee's stay at the institute was to study spatial planning, landscape-ecological assessments of urban and agricultural land and also assessment of the developmental effects of settlements in protected areas and NATURA 2000 areas under the conditions in Slovakia.

Internships of ILE SAS PhD students:

Tomáš Rusňák

- International Summer School "Data Management in Environmental and Earth Science Infrastructures: theory and practice" 2019, Lecce, Italy
- eLTER Information Management Training - Vienna 2019, Austria,
- ESA - 2019 Living Planet Symposium, Milan, Italy

Petra Gašparovičová

- DBU (Deutsche Bundesstiftung Umwelt): Fellowships for graduates from Central and Eastern Europe (CEE) in Germany with environmental relevance - University Freiburg 2018

Michaela Kalivodová

- ALTER-Net summer school, ITLA summer school 2018

- Research-study stay at the University of Valencia (financed by The National Scholarship Programme), co-organizer of Vedatour 2019 events

Andrej Raniak

- Erasmus+ internship at Higher School of Tourism and Ecology in Poland (Wyzsza Skola Turystyki i Ekologii), 2021
- eLTER Information Management Training - Vienna 2019, Austria
- ESA - 2019 Living Planet Symposium, Milan, Italy

Ivan Laco

- Summer academy „RIGHT LIVELIHOOD“ IN TERRACED LANDSCAPES organized by ITLA in the Canary Islands, Spain, 2018

Other ILE SAS PhD students activities:

Martin Izsóff

- Rector's Award of the University of Constantine the Philosopher in Nitra for internationally accepted publishing activities (2017)

Pavol Purgat

- The winner of the "Young Arachnologist 2020" competition for the best student contribution to the XVIII. Arachnological Conference.

2.5.3. PhD career path – Information on the next career steps of the PhD graduates who received their degree from the institute

All students that successfully defended their dissertation thesis found a job in their study field within one year at organisations like State protection of Nature of SR, the Ministry of Environment of Slovak republic, or Bratislava city hall, or at foreign non-profit organisations focused on nature preservation. One student continued to study at a foreign university. Four of the successful PhD. students became research scientists at the ILE SAS. Two of them are at the postdoc. position funded from the project URANOS and project DREAM.

2.5.4. Summary table on educational activities

Teaching	2016	2017	2018	2019	2020	2021
Lectures (hours/year)*	85	72	40	40	26	53
Practicum courses (hours/year)*	20	0	5	0	0	0
Supervised diploma and bachelor thesis (in total)	9	9	7	9	5	6
Members in PhD committees (in total)	6	7	8	4	4	7
Members in DrSc. committees (in total)	0	1	0	1	1	1
Members in university/faculty councils (in total)	5	5	5	5	5	5
Members in habilitation/inauguration committees (in total)	0	3	0	3	2	2

2.5.5. List of published university textbooks

-

2.5.6. Number of published academic course books

ŠVAJDA, Juraj - ČERNECKÝ, Ján. Fragmentácia a ochrana konektivity krajiny. In Úvod do systémovej ekológie I. Prípadové štúdie [Fragmentation and protection of the landscape connectivity. In Introduction in systematic ecology I : Case studies]. - Banská Bystrica: Belianum - vydavateľstvo UMB v Banskej Bystrici, 2021, s. 69-77. ISBN 978-80-557-1841-5. Type: ACD

2.5.7. List of joint research laboratories/facilities with universities

Joint research laboratory (referred to as the Common Department) with the Department of Ecology and Environmental Sciences at the Faculty of Natural Sciences of Constantine the Philosopher University in Nitra.

The staff of the Institute of Landscape Ecology participates in the pedagogical activities of the department, namely in projects, teaching, consultations for Master and PhD students, supervision of seminars and diploma theses, organizing field courses and in Master and PhD examination committees.

Institute staff cooperate with other leading Slovak universities in the form of participation in state examination committees, lectures and exercises, and supervision bachelor's and master's theses as well as cooperation on scientific projects.

Faculty of Natural Sciences, Comenius University Bratislava (PrIFUK):

Department of Zoology - H. Kalivoda is a regular member of the State Examination Committee and supervises bachelor and diploma theses (H. Kalivoda).

Department of Landscape Ecology - consultations for diploma and PhD students, supervision of seminar, bachelor and diploma theses (M. Moyzeová, J. Špulerová, Z. Krnáčová, H. Kalivoda, R. Kanka). The staff are appointed as thesis opponents at all 3 levels of higher education, they are members of the commissions for rigorosum examinations and bachelor thesis defences as well as of the state final examination commissions (Ľ. Halada, Z. Krnáčová, D. Štefunková, M. Moyzeová).

Department of Pedology – lectures and exercises (J. Kollár, P. Kenderessy)

Technical University (TU) Zvolen - L. Miklós is a member of the Attestation Committee and the Scientific Board

Faculty of Ecology and Environmental Science TU Zvolen - Z. Izakovičová, M. Moyzeová, J. Špulerová are members of the State Examination Commissions and the Commissions for the defence of thesis and dissertation theses, they oppose the final theses, etc.

Slovak University of Agriculture (SPU) Nitra

Faculty of European Studies and Regional Development - L. Miklós is a member of several commissions for the defence of doctoral theses

Faculty of Horticulture and Landscape Engineering SPU Nitra - D. Štefunková is a member of the state examination committee in the field of garden and landscape architecture

2.5.8. Supplementary information and/or comments on doctoral studies and educational activities – focused on what changes have occurred since the last evaluation in 2016

In the assessment of the previous accreditation, some problems were specified with doctoral studies that lowered their quality, such as weak internationalisation (absence of foreign PhD. Students or low participation of native PhD. students in internships abroad) and low publication activity of PhD. students and their mentors in prestigious journals listed in databases. The low interest of excellent students in doctoral studies during this period was caused partially by low scholarships and wages of PhD. students and post-doctorates.

In accordance with the Organization 's Action Plan, which ILE SAS adopted in 2018, doctoral studies are provided by 14 approved mentors. The following were approved as guarantors of a program of study from ILE SAS: Ľ. Halada (guarantor of a programme of ecological and environmental sciences), Z. Izakovičová (guarantor of a programme of agriculture and landscaping) and R. Kanka (guarantor of a programme of biological sciences).

We provide doctoral studies in cooperation with the Faculty of Natural Sciences and Informatics, Constantine the Philosopher University in Nitra, where we have a joint research laboratory.

Since the academic year 2016/2017, PhD. students have strictly-set criteria of publication activities, internships abroad and participation at foreign conferences in accordance with the Action

Plan of ILE SAS. This was reflected in the number of these activities in comparison with the previous accreditation period.

Doctoral students partly secure funding for their research for their dissertation through successfully submitted projects, which are announced annually by the University Grant Agency of the University of Constantine the Philosopher in Nitra (UGA) and the Slovak Academy of Sciences (Doktorgrant). 12 PhD. students from ILE SAS were awarded UGA and Doktorgrant grants during the accreditation period.

PhD. students were more successful in publishing in WOS and SCOPUS databases in comparison with the previous accreditation period. Overall, they were authors or co-authors in 29 papers published in journals registered in CC, WOS and SCOPUS. In 16 of these papers, they were first authors. One PhD. student was first author in 3 monographs published by national publishing houses and first author of 3 chapters in monographs published by foreign publishing houses.

The publishing activity of the mentors of PhD. students has also significantly improved (see chapter 3.).

As documented by the list of publications and citations of the Institute, the publication activity of the mentors has also increased significantly. During the accreditation period, five new mentors were added, all of whom were our own staff members who had obtained the degree of scientific qualification IIa. One staff member obtained the title of Doc. degree at the University of Constantine the Philosopher.

In this accreditation period there were PhD. students at 5 foreign internships and summer schools, and also at 3 training workshops abroad. They also presented at 10 foreign conferences. In this period, we trained two foreign PhD. students. On the contrary, 7 foreign PhD students and postdocs took advantage of their interest in study stays at the Institute of Landscape Ecology in the period 2016-2021. We try to increase the number of foreign students, but we face restrictions in organisation of international studies at our partner university. To this day, there is not fully secured admission procedure and organisation of PhD. studies in English.

In order to increase the quality of doctoral studies, in 2019-2022 we prepared and concluded a framework agreement with the Faculty of Natural Sciences of Comenius University Bratislava on participation in the provision of PhD. studies in the field of Soil Ecophysiology and Environmental Soil Science.

2.6. Societal impact

2.6.1. The most important case studies of the research with direct societal impact, max. 4 for institute with up to 50 FTE researchers, 8 for institutes with 50 – 100 FTE researchers and so on. Structure: Summary of the impact; Underpinning research; References to the research; Details of the impact; Sources to corroborate the impact. One page per one case study

Support system for the creation of local territorial systems of ecological stability

Green infrastructure is a net of natural and semi-natural areas and green spaces that provide various ecosystem and environmental services. Concept of green infrastructure in Slovakia is realized by a concept of Territorial System of Ecological Stability (TSES) that represents spatial structure of mutually connected ecosystems and their elements. It provides diversity of conditions and life forms in the landscape. The result of the assessment of the ecological stability of the area is a suggestion of elements that increase ecological stability of area – framework of TSES (bio-centers, bio-corridors, interaction elements) and a group of eco-stabilization measures. TSES has three hierarchical stages: supra regional, regional and local. Municipalities use these documents as the base for spatial planning and optimal use of the area (Miklós et al. 2018a, 2018b, Izakovičová et al. 2019). We participated on commission from Slovak Environmental Agency (SEA) as a research guarantor. The output is an automated support system for making a TSES at local level. We prepared a methodology for processing of TSES documents in cooperation with companies Esprit, Ltd. and Microcomp, Ltd. (Miklós et al. 2020a, 2020b). Automated system will serve as a strong support tool for compliers with required competence and standard knowledge of

GIS. It will allow to effectively create high quality TSES projects. It will also serve as an effective tool for decision making in spatial planning and landscape management for a wide spectrum of actors. We have tested this system on model area Dolný Lopašov (Špulerová a kol. 2020). SEA is currently verifying functionality of this system on various model areas, in cooperation with ILE SAS that is a research guarantor. This new automation tool will help especially processors of TSES and it will simplify processing of data for wide range of municipalities. Processing and implementation of TSES projects will have a positive impact on development of these areas, increase in their ecological stability and improve of environment. It will bring a complex integrated landscaping solution, increasing the share of green infrastructure elements that provide water retention, erosion elimination and flood mitigation.

IZAKOVIČOVÁ, Zita – MIKLÓS, László – ŠPULEROVÁ, Jana. Basic principles of sustainable land use management. In Current trends in landscape research: Innovations in landscape research. - Cham : Springer Nature, 2019, p. 395-423.

MIKLÓS, László – KOČICKÁ, Erika – IZAKOVIČOVÁ, Zita – KOČICKÝ, Dušan – ŠPINEROVÁ, Anna – DIVIAKOVÁ, Andrea – MIKLÓSOVÁ, Viktória. Landscape as a geosystem. Cham : Springer, 2018a. 161 p.

MIKLÓS, László – KOČICKÝ, Dušan – IZAKOVIČOVÁ, Zita – ŠPULEROVÁ, Jana – ŠTEFUNKOVÁ, Dagmar – MIKLÓSOVÁ, Viktória – DAVID, Stanislav – MOYZEOVÁ, Milena – KOZELOVÁ, Ivana – KANKA, Róbert. Metodika na automatizované generovanie dokumentov MÚSES : Spracovanie dokumentov MÚSES pre potreby vytvorenia základnej východiskovej bázy pre reguláciu návrhu budovania zelenej infraštruktúry = Záverečná správa etapy. Produkt 1 [Methodology for automated generation of Territorial System of Ecological Stability documents, Final report of 1st stage. Deliverable 1]. Bratislava: Ústav krajinnej ekológie SAV; ESPRIT Banská Štiavnica; SAŽP Banská Bystrica, 2020a. 279 p.

MIKLÓS, László – DIVIAKOVÁ, Andrea – IZAKOVIČOVÁ, Zita. Ecological networks and territorial systems of ecological stability. Cham: Springer, 2018b. 159 p.

MIKLÓS, László – KOČICKÝ, Dušan – IZAKOVIČOVÁ, Zita – ŠPULEROVÁ, Jana – KANKA, Róbert – ŠTEFUNKOVÁ, Dagmar – MIKLÓSOVÁ, Viktória – MOYZEOVÁ, Milena – KOZELOVÁ, Ivana – PONDELÍK, Radovan. Návrh algoritmov pre jednotlivé časti dokumentov MÚSES: Spracovanie dokumentov MÚSES pre potreby vytvorenia základnej východiskovej bázy pre reguláciu návrhu budovania zelenej infraštruktúry = Záverečná správa etapy. Produkt 2 [Design of algorithms for Territorial System of Ecological Stability documents. Final report of 2nd stage. Deliverable P2.]. Bratislava: Ústav krajinnej ekológie SAV; Banská Štiavnica: ESPRIT; Banská Bystrica: SAŽP, 2020b. 213 p.

ŠPULEROVÁ, Jana – IZAKOVIČOVÁ, Zita – KALIVODA, Henrik – MIKLÓS, László – MIKLÓSOVÁ, Viktória – MOYZEOVÁ, Milena – RANIAK, Andrej – ŠTEFUNKOVÁ, Dagmar – VLACHOVIČOVÁ, Miriam – RÁKAYOVÁ, Renáta – ŠPILÁROVÁ, Ivana – PONDELÍK, Radovan – IVANIČ, Boris – MARETTA, Martin – ŠTEC, Peter – KOČICKÝ, Dušan. Miestny územný systém ekologickej stability obce Dolný Lopašov: Spracovanie dokumentov miestnych územných systémov ekologickej stability pre potreby vytvorenia základnej východiskovej bázy pre reguláciu návrhu budovania zelenej infraštruktúry [Local territorial system of ecological stability of the village Dolný Lopašov]. Bratislava: Ústav krajinnej ekológie SAV, 2020. 138 p.

Traditional Agricultural Landscape Structures as High Nature Value areas

One of the research topics of ILE SAS, are Traditional Agricultural Landscape Structures (TALS). They are traditional small-scale mosaics of cultivated land and permanent crops which did not change during the collectivization of agriculture from the 1950s to the 1980s (Dobrovodska et al., 2019; Lieskovský et al., 2017; Špulerová et al., 2018). Nowadays they form unique biodiversity islands in the landscape. We have presented research results on various popularization events (Days of the field Agrokomplex) and we published them in research-popularization monograph (Špulerová et al., 2017). This monograph was awarded in Agrokomplex exhibition 2017 by Zlatý Kosák prize awarded by Minister of Agriculture and Rural Development of the Slovak republic miss Gabriela Matečná. Results of nationwide mapping of TALS served as a base for identification of High Nature Value areas – type 2 (HNV – High Nature Value farmland) for Ministry of Agriculture and Rural Development. HNV2 type are lightly used mosaics with share of natural elements (MPaRV SR, 2014). Based on this experience, ILE SAS, p. r. i. participated also in the monitoring

and evaluation of the contribution of the Rural Development Program (RDP) to preservation of High Nature Value areas within ex post evaluation RDP 2007 – 2013; and evaluation of RDP 2014-2020. For this purpose we have developed a methodology for monitoring of RDP impacts for High Nature Value areas type 2 (HNV2) within Registry of Agricultural Land (Šatalová et al., 2021). Results of our study confirmed a positive effect of RDP subsidies for preservation and sustainable management of HNV. We also presented these results in the preparation of the proposed new measures of the Rural Development Program, within the expert groups at the Ministry of Agriculture.

DOBROVODSKÁ, Marta** - KANKA, Róbert - DAVID, Stanislav - KOLLÁR, Jozef - ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - MOJSES, Matej - PETROVIČ, František - KRIŠTÍN, Anton - STAŠIOV, Slavomír - HALADA, Ľuboš - GAJDOŠ, Peter. Assessment of the biocultural value of traditional agricultural landscape on a plot-by-plot level: case studies from Slovakia. In *Biodiversity and Conservation*, 2019, vol. 28, iss. 10, p. 2 615-2 645.

LIESKOVSKÝ, Juraj - LIESKOVSKÝ, Tibor - PISCOVÁ, Veronika. Physical accessibility and its role in landscape development - three historical analyses from South Slovakia. In *Landscape research*, 2017, vol. 42, no. 5, p. 498-507.

ŠATALOVÁ, Barbora** - ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - DOBROVODSKÁ, Marta - VLACHOVIČOVÁ, Miriam - KOZELOVÁ, Ivana. Monitoring and evaluating the contribution of the rural development program to high nature value farmland dominated by traditional mosaic landscape in Slovakia. In *Ecological Indicators*, 2021, vol. 126, article no. 107 661.

ŠPULEROVÁ, Jana** - PETROVIČ, František - MEDERLY, Peter - MOJSES, Matej - IZAKOVIČOVÁ, Zita. Contribution of traditional farming to ecosystem services provision: Case studies from Slovakia. In *Land*, 2018, vol. 7, no. 74, p. 1-24.

ŠPULEROVÁ, Jana - ŠTEFUNKOVÁ, Dagmar - DOBROVODSKÁ, Marta - IZAKOVIČOVÁ, Zita - KENDERESSY, Pavol - VLACHOVIČOVÁ, Miriam - LIESKOVSKÝ, Juraj - PISCOVÁ, Veronika - PETROVIČ, František - KANKA, Róbert - BAČA, Andrej - BARANČOKOVÁ, Mária - BEZÁK, Peter - BEZÁKOVÁ, Magdaléna - BOLTÍŽIAR, Martin - MOJSES, Matej - DUBCOVÁ, Magdaléna - GAJDOŠ, Peter - GERHÁTOVÁ, Katarína - IZSÓFF, Martin - KALIVODA, Henrik - MIKLÓSOVÁ, Viktória - DRÁBOVÁ, Monika - ŠATALOVÁ, Barbora - KRIŠTÍN, Anton - DANKANINOVÁ, Lenka - KALIVODOVÁ, Eva - MAJZLAN, Oto - MIHÁL, Ivan - STAŠIOV, Slavomír - ŠOLOMEKOVÁ, Tatiana - AMBROS, Michal - BALÁŽ, Ivan - HALABUK, Andrej. *Historické štruktúry poľnohospodárskej krajiny Slovenska*. Bratislava: Veda, 2017. 144 p.

ŠPULEROVÁ, J., ŠATALOVÁ B., DOBROVODSKÁ M., ŠTEFUNKOVÁ D., VLACHOVIČOVÁ M., 2016: Posúdenie miery vplyvu PRV 2007-2013 k ochrane a zveľaďovaniu prírodných zdrojov a krajiny vrátane biodiverzity a území s vysokou prírodnou hodnotou v poľnohospodárstve (Assessment of the level of RDP 2007 – 2013 impact on protection and enhancement of natural resources and landscape including biodiversity and areas with high nature value in agriculture). Bratislava : Ústav krajinnej ekológie SAV, 2016. 35 p.

ŠPULEROVÁ, J., ŠATALOVÁ B., DOBROVODSKÁ M., ŠTEFUNKOVÁ D., VLACHOVIČOVÁ M., KOZELOVÁ I., 2019: Posúdenie miery vplyvu PRV SR 2014-2020 k ochrane a zveľaďovaniu prírodných zdrojov a krajiny vrátane biodiverzity a území s vysokou prírodnou hodnotou v poľnohospodárstve (Assessment of the level of RDP 2014 – 2020 impact on protection and enhancement of natural resources and landscape including biodiversity and areas with high nature value in agriculture). Bratislava : Ústav krajinnej ekológie SAV. 30 p.

Expressway R1 – Appropriate Impact Assessment on the territories of the Natura 2000

ILE SAS, p. r. i. was solving a project Appropriate Impact Assessment on the territories of the Natura 2000 sites of the proposed construction of the R1 expressway in the section Slovenská Ľupča – Ružomberok in the period from 1.1.2017 to 30.7.2019. Project was divided into three separate parts (separate studies) according to proposed sections of R expressway: 1. section Slovenská Ľupča – Korytnica, county border, 2. Section Korytnica, county border – Ružomberok, south and 3. Section Ružomberok, south – Crossroad D1. In this area between Slovenská Ľupča and Ružomberok, detailed survey of flora, fauna and habitats (on the level of basic scientific research) took place in the years 2017 and 2018. The aim of the survey was to gain as detailed data as possible needed for evaluation of impacts. Subsequently, we prepared a documentation of

appropriate impact assessment of the proposed activity on the territories of the Natura 2000 according to current legislative and methodology of Appropriate Impact Assessment on the territories of the Natura 2000 sites in Slovak Republic (Barančok a kol., 2018a, 2018b, 2019). The proponent (client) of this project was National Motorway Company, Inc. (Národná diaľničná spoločnosť, Inc.) Dúbravská cesta 14, 841 04 Bratislava, IČO 35 919 001. The elaborated documentation of Appropriate Impact Assessment in accordance to individual sections is a part of Environmental Impact Assessment (EIA) documentation. Proponent and the National protection of nature use it as a base for selection of suitable variants of proposed activity and for minimizing or even elimination of its impacts on Natura 2000 sites and the subject of their protection (species and habitats of European importance).

BARANČOK, Peter - BARANČOKOVÁ, Mária - CHASNÍKOVÁ, Silvia - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - PALAJ, Andrej - ŠIBÍKOVÁ, Mária - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1: Úsek Slovenská Ľupča - Korytnica, hranica kraja = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1: Road section Slovenská Ľupča – border of Korytnica region. Appropriate impact assessment on the territories of Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2018. 222 p. Typ: AGI

BARANČOK, Peter - BARANČOKOVÁ, Mária - CHASNÍKOVÁ, Silvia - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - KOLLÁR, Jozef - PALAJ, Andrej - ŠIBÍKOVÁ, Mária - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1: Úsek Korytnica, hranica kraja - Ružomberok Juh = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1: Road section from border of Korytnica region to Ružomberok South. Appropriate impact assessment on the territories of Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2018. 258 s. Typ: AGI

BARANČOK, Peter - BARANČOKOVÁ, Mária - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - KOLLÁR, Jozef - PALAJ, Andrej - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1: Úsek Ružomberok Juh - križovatka D1 = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1: Road section Ružomberok South – Crossroad D1. Appropriate impact assessment on the territories of Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2019. 257 s. Typ: AGI

Development of an adaptive forecasting system for plant protection in the cooperation of Slovakia – Hungary border wine regions

Climate change is a significant factor threatening the development of viticulture, especially the rapidly changing weather, which is the impulse for the development of fungi and other various vine diseases. If these diseases spread, they can easily destroy and harvest and even whole stands in a short time. Winegrowers fight diseases and pests mainly by using large amounts of chemicals. For winegrowers, this means a large item of expenditure with an uncertain outcome, as well as a negative impact on the environment. ILE SAS in cooperation with the TEU in Budapest carried out a project focused on solving current problems related to viticulture, specifically those of mould and various other diseases of the grapevine. We together created a new forecasting system to protect the grapevines which models the spread of diseases and pests. The application of the model will contribute to the improvement of management in the vineyards and to reducing consumption of chemicals to protect the grapevine, thus lowering the pressure on the environment and at the same time improving crop protection, which should subsequently also have beneficial socio-economic effects. By knowing the exact predictions, it is possible to save up to 30% of the costs of vineyard protection

The results consisted of two parts:

- Installation and testing of measuring devices that would serve as a forecasting system. These are special measuring devices that monitor microclimatic conditions directly in the vineyards, such as temperature, precipitation, air humidity, leaf humidity, soil-climatic conditions, or phenological phases of the vineyard. This information is automatically sent to a remote server every two minutes, where it is processed and made available to winegrowers. The model predicts the development of these parameters in the coming days and, based on these predictions, models the possible development of vine diseases (powdery mildew, downy mildew, gray mold, black mold) and suggests optimal vine treatment time for local winegrowers, whether it is appropriate and necessary to spray when to start. The winegrower obtains the information via the internet connection to the server immediately and it is up to him

whether to carry out the spraying or not. The system will provide a weather forecast for 48 hours.

- Landscape-ecological typing of vineyard areas. The microclimatic conditions in the vineyards vary from place to place, and there may be a different microclimatic situation at virtually every ten meters. Measuring instruments are too rare to be installed in any vineyard. Therefore, it was necessary to identify areas with similar conditions to which measurements and predictions from a single instrument could then be applied. Within the project, landscape ecological typing was prepared, which evaluates the impact of the operation of individual devices.

Measuring instruments are located in: Malokarpatský wine-growing region, Orešanský wine-growing district: Zvončín; and Central Slovakian wine-growing region, Modrokamenský wine-growing district: Veľký Krtíš, Nenince

Research support; project: HUSK 1101/121/0287: Development of an adaptive forecasting system for plant protection in the cooperation of border wine regions in order to increase their competitiveness, which was implemented within the cross - border cooperation program Hungary - Slovak Republic.

Research links; MIKLÓS, László - KOČICKÝ, Dušan - IZAKOVIČOVÁ, Zita - ŠPINEROVÁ, Anna - MIKLÓSOVÁ, Viktória. Compensation for the lack of measured data on decisive cultivation conditions in diversified territories without losing correct information In Land, 2021, vol. 10, iss. 9, article no. 940.

Resources to confirm the impact: Winegrowers of the villages Zvončín, Veľký Krtíš, Nenice

2.6.2. List of the most important studies and/or other activities commissioned for the decision-making authorities, the government and NGOs, international and foreign institutes (title, name of institution, contract value, purpose (max 20 words))

Prepared for the Slovak Environmental Agency:

MIKLÓS, László - KOČICKÝ, Dušan - IZAKOVIČOVÁ, Zita - ŠPULEROVÁ, Jana - KANKA, Róbert - ŠTEFUNKOVÁ, Dagmar - MIKLÓSOVÁ, Viktória - MOYZEOVÁ, Milena - KOZELOVÁ, Ivana - PONDELÍK, Radovan. Návrh algoritmov pre jednotlivé časti dokumentov MÚSES: Spracovanie dokumentov MÚSES pre potreby vytvorenia základnej východiskovej bázy pre reguláciu návrhu budovania zelenej infraštruktúry = Záverečná správa etapy. Produkt 2 [Design of algorithms for Territorial System of Ecological Stability documents. Final report of 2st stage. Deliverable P2.]. Bratislava: Ústav krajinej ekológie SAV ; Banská Štiavnica : ESPRIT ; Banská Štiavnica : SAŽP, 2020. 213 p.

Prepared for the municipality Dolný Lopašov:

ŠPULEROVÁ, Jana - IZAKOVIČOVÁ, Zita - KALIVODA, Henrik - MIKLÓS, Správa o činnosti organizácie SAV 93 László - MIKLÓSOVÁ, Viktória - MOYZEOVÁ, Milena - RANIAK, Andrej - ŠTEFUNKOVÁ, Dagmar - VLACHOVIČOVÁ, Miriam - RÁKAYOVÁ, Renáta - ŠPILÁROVÁ, Ivana - PONDELÍK, Radovan - IVANIČ, Boris - MARETTA, Martin - ŠTEC, Peter - KOČICKÝ, Dušan. Miestny územný systém ekologickej stability obce Dolný Lopašov: Spracovanie dokumentov miestnych územných systémov ekologickej stability pre potreby vytvorenia základnej východiskovej bázy pre reguláciu návrhu budovania zelenej infraštruktúry [Local territorial system of ecological stability of the village Dolný Lopašov]. Bratislava: Ústav krajinej ekológie SAV, 2020. 138 p.

Prepared for Ministry of Environment:

POVAŽAN, Radoslav - FILČÁK, Richard - CHRENKO, Milan - MEDERLY, Peter - ŠPULEROVÁ, Jana - IVANEGO VÁ, Boglárka - KADLEČÍK, Ján - KAPUSTA, P. - GUSEJNOV, Simona - ŠVAJDA, Juraj - ŠTASTNÝ, Pavel - VIESTOVÁ, Eva - ČERNECKÝ, Ján. Nature outlook 2050 : Scenarios for nature in Slovakia and implications for public policies [Scenáre pre prírodu na Slovensku a ich implikácia do verejnej politiky]. Radoslav Považan ...[et al.]. Bratislava: Ministry of the Environment of the Slovak Republic: Slovak Environment Agency, 2020. 41 p.

Prepared for the National Motorway Company:

BARANČOK, Peter - BARANČOKOVÁ, Mária - CHASNÍKOVÁ, Silvia - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - PALAJ, Andrej - ŠIBÍKOVÁ, Mária - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1: Úsek Slovenská Ľupča - Korytnica, hranica kraja = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1: Road section Slovenská Ľupča - Korytnica, border of the region. Appropriate impact assessment on the territories of the Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2018. 222 p. Type: AGI

BARANČOK, Peter - BARANČOKOVÁ, Mária - CHASNÍKOVÁ, Silvia - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - KOLLÁR, Jozef - PALAJ, Andrej - ŠIBÍKOVÁ, Mária - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1: Úsek Korytnica, hranica kraja - Ružomberok Juh = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1. Section of the road Korytnica, border of the region – Ružomberok South. Appropriate impact assessment on the territories of the Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2018. 258 p. Type: AGI

BARANČOK, Peter - BARANČOKOVÁ, Mária - KALIVODA, Henrik - KANKA, Róbert - KMEŤOVÁ, Martina - KOLLÁR, Jozef - PALAJ, Andrej - VLACHOVIČOVÁ, Miriam. Rýchlostná cesta R1 : Úsek Ružomberok Juh - križovatka D1 = Primerané posúdenie vplyvov na územia Natura 2000 [Expressway R1: Road section Ružomberok South – Crossroad D1, Appropriate impact assessment on the territories of the Natura 2000]. Bratislava: Ústav krajinej ekológie SAV, 2019. 257 p. Type: AGI

Prepared for the Ministry of Agriculture and Rural Development:

ŠPULEROVÁ, Jana - ŠATALOVÁ, Barbora - DOBROVODSKÁ, Marta - ŠTEFUNKOVÁ, Dagmar - VLACHOVIČOVÁ, Miriam - KOZELOVÁ, Ivana. Posúdenie miery vplyvu PRV SR 2014-2020 k ochrane a zveľaďovaniu prírodných zdrojov a krajiny vrátane biodiverzity a území s vysokou prírodnou hodnotou v poľnohospodárstve [Impact assessment of the RDP SR 2014-2020 on the protection and enhancement of natural resources, biodiversity and high nature value farmland]. Bratislava: Ústav krajinej ekológie SAV, 2019. 30 s. AGI06

ŠPULEROVÁ, Jana - ŠATALOVÁ, Barbora - DOBROVODSKÁ, Marta - ŠTEFUNKOVÁ, Dagmar - VLACHOVIČOVÁ, Miriam - KOZELOVÁ, Ivana - PISCOVÁ, Veronika - PALAJ, Andrej. Monitoring území s vysokou prírodnou hodnotou (HNV2) - poľnohospodárska mozaiková krajina s nízkou intenzitou poľnohospodárstva a s prírodnými a štruktúrnymi prvkami [Monitoring of high nature value farmland type 2: Farmland dominated by low-intensity agriculture or a mosaic of seminaturaland cultivated land and small-scale features]. Bratislava: Správa o činnosti organizácie SAV 99 Ústav krajinej ekológie SAV, 2019. 91 p.

Prepared for European environmental agency:

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 7 Habitat factsheets. Rivers and Lakes. European Centre for Nature Conservation, 2016. 38 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Atlantic Seminar) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 8 Habitat factsheets. Other habitats: woodland and forests. European Centre for Nature Conservation, 2016. 28 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Atlantic Seminar) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 7 - habitat group factsheets - grassland habitats. European Centre for Nature Conservation, 2016. 39 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Boreal Seminar) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 4 Habitat factsheets Coastal and Dunes (incl. estuaries). European Centre for Nature Conservation, 2016. 47 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Atlantic Seminar) Type: AGI

HALADA, Ľuboš - KLIMANTOVÁ, Alexandra - GERHÁTOVÁ, Katarína - RICHARD, Dominique. Supporting elements for the Atlantic Natura 2000 review seminar: (2nd part: Fact sheets for Low hanging fruits habitats). Paris: European Environment Agency : European Topic Centre on Biological Diversity, 2016. 72 p. Available at: <http://bd.eionet.europa.eu/> (EEA 0292 : European Topic Centre on Biological Diversity) Type: AGI

HALADA, Ľuboš - GERHÁTOVÁ, Katarína - MATUŠICOVÁ, Noémi - ARONSSON, Mora - EVANS, Doug - RICHARD, Dominique. Supporting elements for the Boreal Natura 2000 review seminar: 2nd part: Fact sheets for Low hanging fruits habitats. Paris : European Topic Centre on Biological Diversity, 2016. 63 p. Available at: <http://bd.eionet.europa.eu/> (EEA 0292 : European Topic Centre on Biological Diversity) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 4 - habitat group factsheets - freshwater habitats. European Centre for Nature Conservation, 2016. 19 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Boreal Seminar) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 6 Habitat factsheets Heaths and bogs. European Centre for Nature conservation, 2016. 31 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Atlantic Seminar) Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - EVANS, Doug. Natura 2000 Seminars: Natura 2000 Biogeographical Process = Annex 5 Habitat factsheets Wet and dry grasslands. European Centre for Nature Conservation, 2016. 29 p. Available at: http://ec.europa.eu/environment/nature/natura2000/seminars_en.htm (Second Atlantic Seminar) Type: AGI

HALADA, Ľuboš - GERHÁTOVÁ, Katarína - BAČA, Andrej. Supporting elements for the Alpine Natura 2000 review seminar (2nd part: Fact sheets for Low hanging fruits habitats). Paris: European Topic Centre on Biological Diversity, 2017. 80 p. Available on: <http://bd.eionet.europa.eu/> Type: AGI

HALADA, Ľuboš - KLIMANTOVÁ, Alexandra - ARONSSON, Mora - RICHARD, Dominique. Supporting elements for the Mediterranean Natura 2000 review seminar (1st part: Core Document). Paris: European Topic Centre on Biological Diversity, 2017. 34 p. Available at: <http://bd.eionet.europa.eu/> Type: AGI

HALADA, Ľuboš - ARONSSON, Mora - RICHARD, Dominique. Supporting elements for the Alpine Natura 2000 review seminar (1st part: Core document). Paris: European Topic Centre on Biological Diversity, 2017. 29 p. Available at: <http://bd.eionet.europa.eu/> Type: AGI

HALADA, Ľuboš - KLIMANTOVÁ, Alexandra - RICHARD, Dominique. Supporting elements for the Mediterranean Natura 2000 review seminar (2nd part: Fact sheets for Low hanging fruits habitats). Paris: European Topic Centre on Biological Diversity, 2017. 92 p. Available at: <http://bd.eionet.europa.eu/> Type: AGI

HALADA, Ľuboš - LIESKOVSKÝ, Juraj - CONDÉ, Sophie. Working paper on pressures hotspots on selected grassland ecosystems using Art. 17 reporting. Paris: European Topic Centre on Biological Diversity, 2017. 37 p. Available at: <http://bd.eionet.europa.eu/> Type: AGI

HALADA, Ľuboš - GAUDILLAT, Zelmira - LIESKOVSKÝ, Juraj. Preparatory analyses and assessments in support of the 2020 State of Nature = Proposal of indicator groups of habitats and species in relation to main pressures and measures. Copenhagen: European Environment Agency, 2018. 43 p. Type: AGI

HALADA, Ľuboš - CONDÉ, Sophie. Concept for development of biodiversity indicator for the HNV forest areas. Copenhagen : European Environment Agency, 2018. 20 p. Type: AGI

Proposals of the ecological grouping of the Habitats Directive habitats and species [Návrh ekologických skupín habitatov a druhov Smernice o stanovištiach]. Editors Ľuboš Halada, Peter Gajdoš, Zelmira Gaudillat. Paris: European Topic Centre on Biological Diversity, 2020. 38 p. Available at: <https://forum.eionet.europa.eu/etc-bd-consortium/library/etc-bd-2019-2021/etc-bd-2020/1.7.1.1.-support-eu-nature-reporting-process> Type: AGI

HALADA, Ľuboš - GAJDOŠ, Peter - GAUDILLAT, Zelmira - NOEBEL, Rebecca - GAŠPAROVIČOVÁ, Petra. Proposals for the ecological grouping of the Habitats Directive habitats and species [Návrhy na ekologické zoskupenie habitatov a druhov Smernice o stanovištiach]. Paris: European Topic Centre on Biological Diversity, 2021. 48 p. Type: AGI

2.6.3. List of contracts and research projects with industrial and other commercial partners, incl. revenues (study title, name of institution, contract value, country of partner, purpose (max 20 words))

NEEMO – Monitoring of LIFE projects (action grants and operating grants), communication about the LIFE programme and other linked activities- NEEMO EEIG

Funding: 2574615 € (DG-Environment)

Principal investigator from ILE SAS: Ing. Oszlányi Július, CSc.

Coordinator: Particip GmbH, Germany

Partners: 7 institutions from 7 European countries

Duration: 1.1.2015 – 31.12.2018

NEEMO EIG 2019 - Inter-institutional single framework contract for the provision of support for the monitoring of LIFE projects, communication about the LIFE programme and other related activities

Funding: 2125107 € (DG – Environment)

Principal investigator from ILE SAS: Mgr. Bezák Peter PhD.

Coordinator: Particip GmbH, Germany

Partners: DAI, United Kingdom; Prospect, AEIDL, Belgium; Oréade-Brèche, France; ELLE, Latvia; IDOM, Spain; Timesis, Italy

Duration: 1. 1. 2019 - 31. 12. 2022

Vypracovanie automatizovaného podporného systému na spracovanie dokumentácie Miestneho územného systému ekologickej stability (MÚSES)

Development of an automated support system for processing of documentation of LTSES (Local Territorial System of Ecological Stability)

Funding: Microcomp Ltd. 105000 €

Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.

Coordinator: Microcomp Ltd.

Duration: 1.1.2021 – 31.12.2021

EX-ANTE HODNOTENIE A SEA PRE STRATEGICKÝ PLÁN SPP 2021-2027

Ex post evaluation of the Rural Development Program for the period 2021-2027

Funding: PROUNION Inc. 6000 €

Principal investigator from ILE SAS: RNDr. Miklósová Viktória PhD.

Coordinator: PROUNION Inc.

Duration: 1.6.2019 -31.12.2022

Návrh algoritmov pre jednotlivé časti dokumentov Miestneho územného systému ekologickej stability (MÚSES)

Proposals of an algorithm for the individual parts of the documentation of LTSES (Local Territorial System of Ecological Stability)

Funding: Microcomp Ltd. 15000 €

Principal investigator from ILE SAS: Dr.h.c. Prof. RNDr. Miklós László, DrSc.

Coordinator: Microcomp Ltd.

Duration: 1.6.2020 – 31.12.2020

Metodika na automatizované generovanie dokumentov Miestneho územného systému ekologickej stability (MÚSES)

Methodology for automated generation of documents on the Local Territorial System of Ecological Stability (LTSES)

Funding: Microcomp Ltd. 120000 €

Principal investigator from ILE SAS: Dr.h.c. Prof. RNDr. Miklós László, DrSc.
Coordinator: Microcomp Ltd.
Duration: 7.1.2020 – 15.2.2020

RÚSES – Regionálny územný systém ekologickej stability okresov Bratislava, Trnava, Malacky, Pezinok, Gelnica

Regional Territorial Systems of Ecological Stability – districts of Bratislava, Trnava, Malacky, Pezinok, Gelnica

Funding: Esprit Ltd. 30832 €

Principal investigator from ILE SAS: Doc. RNDr. Izakovičová Zita, PhD.

Coordinator: Esprit Ltd.

Duration: 1.1.2018 – 31.12.2020

Spracovanie miestneho územného systému ekologickej stability (MÚSES) Dolný Lopašov

Elaboration of Territorial System of Ecological Stability of Dolný Lopašov

Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.

Funding: Microcomp Ltd.: 15000 Eur

Coordinator: Microcomp Ltd.

Duration: 1.2.2020 – 30.11.2020

Nezávislé hodnotenie Programu rozvoja vidieka SR pre obdobie 2014-2020

Independent evaluation of the Rural Development Programme for the period 2014-2020

Funding: PROUNION Inc.: 16758 €

Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.

Coordinator: PROUNION Inc.

Duration: 18.12.2015 – 31.12.2019

Ex post – Ex-post hodnotenie Programu rozvoja vidieka SR pre obdobie 2007-2013

Ex post evaluation of the Rural Development Program for the period 2007-2013

Funding: PROUNION Inc.: 10000 €

Principal investigator from ILE SAS: Ing. Špulerová Jana, PhD.

Coordinator: PROUNION Inc.

Duration: 18.12.2015 – 31.12.2016

2.6.4.1 List of intangible fixed assets (internally registered IP (confidential know-how), patent applications, patents granted, trademarks registered) denoting background IPR)

-

2.6.4.2 List of licences sold abroad and in Slovakia, incl. revenues (background IPR identification, name of institution, contract value, country of partner, purpose (max 20 words))

-

2.6.5. Summary of relevant activities, max. 300 words (describe the pipeline of valorization in terms of Number of disclosure, Number of registered IP internally, number of CCR/LIC contracts and their respective summary values, the support you are receiving in specific points internally at the institute, at SAS, externally – also the limitations and drawbacks.

-

2.7. Popularisation of Science (outreach activities)

2.7.1. List of the most important popularisation activities, max. 20 items

Water in the Landscape Seminar – ILE SAS, p. r. i. & GWP Slovakia - 10.11. 2021

Institute of Landscape Ecology, p. r. i. in cooperation with GWP Slovakia organized a seminar “Water in the Landscape” within a Science and Engineering Week event. Experts from public sector, scientific community and non-governmental organizations presented on this seminar. Experts focused mainly on water, which influences our whole life and its quality. Experts have pointed out how ideal landscape should look like to be naturally resistant against water and wind erosion, drying and floods, which occur due to the extreme weather events related to climate change. Seminar contributed to evaluation of current state of environment on Žitný ostrov, which is valuable site for landscape and protection and protected water area. Until recently it was considered the largest reservoir of drinking water in Central Europe. (V. Miklósová, I. Kozelová, Z. Šíbllová, P. Kenderessy).

ILE SAS on European Researchers' Night 2021

The festival of science - European Researchers' Night is annually organized event throughout Europe. The ERN is the largest of its kind in Slovakia as well as Europe, bringing together people and researchers in 300 cities in about 30 countries on the last Friday of September.

ILE SAS, p. r. i. actively participated on European Researchers' Night by various activities:

- This time, the Science Café talks focused on “Climate Changes and Agriculture”. Selected theme evaluated impacts of climate change on agricultural landscape in Slovakia. Z. Izakovičová and J. Špulerová have presented national and international strategic documents for mitigation of climate changes affecting agricultural land.
- Interview on “Healthy landscape – healthy society”, as part of the main program of European Researchers' Night - a cycle of presentations and interviews on current themes Interview provided Z. Izakovičová.
- Scientists from ILE SAS, have emphasized the benefits of organic farming in mitigating the consequences of climate change in television appearances (Z. Izakovičová, J. Špulerová).
- Our scientists returned to school by participating on program “Visit your school – get to know your scientist”. Thanks to this program, they have popularized environmental research in various regions of Slovakia (M. Moyzeová, M. Bezáková, J. Špulerová)

Launch of the World Network of Mountain Biosphere Reserves

UNESCO Man and Biosphere (MAB) acknowledges a critical value of mountains and their ecosystem services for humankind, and their fragility due to global climate change. Because of that, it again launched World Network of Mountain Biosphere Reserves, to involve all actors working in mountain biosphere reserves, including managers / coordinators of biosphere reserves, mountain specialists, universities, research centers, local communities, OSN agencies and programs, associations and non-governmental organizations.

World Network of Mountain Biosphere Reserves was activated again on 9th of December 2021 during webinar about sustainable tourism in mountain biosphere reserves. UNESCO Man and Biosphere (MAB) and Mountain Research Initiative (MRI) have organized this webinar as a part of celebrations of National Mountain Day.

Institute of Landscape Ecology, p. r. i. also participated on preparation of international network. There was a discussion about position of mountain biosphere reserves in changing global climate, need of decarbonization, massification of mountain areas as a worldwide trend resulting from increasing demand of society, during the launch of network. There was also a discussion about dynamic of post-covid tourism in mountains. Slovakia is represented by our employee V. Piscová in MAB committee.

ILE SAS in GREEN WEEK 2020

EU Green Week is an annual opportunity to debate European environmental policy with policymakers, leading environmentalists and stakeholders from Europe and beyond.

ILE SAS, p. r. i. has been participating for several years on European initiative GREEN WEEK. This year, we have prepared virtual excursion to Chorvátske rameno channel for children from kindergarten on Macharova 1, Bratislava. Educational video provided information about biota and overall use of one of the Danube river arms situated in urbanized area of city part Petržalka.

Children have learned, that also in big cities, such as capital city Bratislava, are water areas where a lot of beneficial and rare plant and animal species live. ILE SAS, p. r. i. received a Certificate of participation for active participation on EU GREEN WEEK 2020 (*Moyzeová, Adamčeková, Vlachovičová, Vlachovič, Šiblová, Kozelová*).

The EU's Common Agriculture Policy and Sustainable Farming: A statement by scientists, December 8, 2020

The EU's Common Agriculture Policy and Sustainable Farming: A statement by scientists, December 8, 2020. This is an open letter, available as publication at the following website: <https://zenodo.org/record/4311314>, which has been sent to representatives of the European Parliament, the Slovak Government, the Ministry of Environment of the Slovak Republic and the Ministry of Agriculture and Rural Development of the Slovak Republic. 40 researches from 13 European Union's (EU) Member States, including Peter Bezák - researcher of the ILE SAS, contributed to this publication. The proposed EU Common Agricultural Policy (CAP) post-2020 as it stands represents a business-as-usual model of agriculture against the viable alternative of a responsible and sustainable farm model that ensures the viability of rural communities. The CAP still fails to address the environmental and socioeconomic challenges of EU's agriculture. Scientific evidence shows that it is possible and efficient to align sustainable farming, multifunctional agroforestry and long-term prosperity with the climate and biodiversity goals of the EU. Farmers' interests and environmental protection can be mutually reinforced and achieved through a CAP that is aligns with the EU's Green Deal and Biodiversity Strategy, while also conforming to the Paris Agreement. In the open letter, researchers claim interest to participate on development of expert and scientific arguments for the CAP reform.

Scientific stand of ILE SAS, p. r. i. and Geographical Institute (GI SAS), p. r. i. "Get to know the landscape from a birds' perspective" as a part of European Researchers' Night 2019 in Stará tržnica, Bratislava Slovakia.

Researchers from ILE SAS, pr. r. i. and GI SAS, p. r. i. have presented together in one scientific stand on this frequently visited popularization event on 27th of September 2019. The aim of this presentation was to illustrate a potential of remote sensing for landscape research. Pupils, students and public had an opportunity to learn about observing the Earth via satellites. They also learned how to use this information in everyday life. We also presented an unmanned aerial vehicle – drone used for surface imaging, optical and thermal camera and multispectral laser scanner. Young visitors had an opportunity to participate on various quizzes and competitions to verify their newly gained knowledge about drones and the need of environmental research.

Slovak National Days of Field 2019.

This exhibition is one of agricultural exhibitions where ILE SAS, p. r. i. presents annually its current research findings. Scientists from ILE SAS, p. r. i. explained risks and threats for agricultural land caused by climate change, endangering of agroecosystems and rising environmental pollution to farmers. Presentations focused on use of remote sensing in precise agriculture and using Territorial system of ecological stability (TSES) in landscaping were very popular too, because they are current topics that bother farmers.

"Visit of Albert II, prince of Monaco, in Slovakia". Scientific Park of Comenius University in Bratislava. 14th of October 2019.

His Royal Highness Prince Albert of Monaco had visited Slovakia in order to strengthen the cooperation between our researchers and his foundation (Prince Albert II of Monaco Foundation) that supports a wide spectrum of environmental projects. Part of the program was award of the honorary title of doctor honoris causa, presentation about the scope of the foundation itself (including of potential for Comenius University) presented by Bernard Fautrier (Minister Plenipotentiary, Chargé de mission to the Minister of State Managing Director Foundation), followed by discussion and presentations about biodiversity of plants and animals in Slovakia. Researcher from ILE SAS, p. r. i. Dr. Róbert Kanka had presented a presentation named "Slovakia – A landscape of unique biodiversity". Following discussion with prince Albert II had been related to wide spectrum of environmental topics.

Carpathian Mountains: significant losses in Europe's biodiversity hotspot in WWF „Living Planet Report 2018“.

On 28th of November 2018, WWF published a global report „Living Planet Report 2018“ (<https://www.worldwildlife.org/pages/living-planet-report-2018>). This important document is published every two years is a complex study of trends of global biodiversity and health of the planet. WWF Danube-Carpathian Programme (WWF DCP) and Science for Carpathians (S4C) prepared a declaration about biodiversity in Carpathians on this occasion. This declaration has been distributed during a “Changing environment. 30 years of environmental development in Central and Eastern Europe” symposium organized by UNEP and WWF DCP in Vienna on 8th of November 2018. This declaration is available on the WWF site: (http://wwf.panda.org/knowledge_hub/where_we_work/black_sea_basin/danube_carpathian/?338710/Carpathian-Mountains-significant-losses-in-Europes-biodiversity-hotspot).

On preparation of declaration participated L. Halada from ILE SAS.

“Science for farmers” seminar during Agrokomplex Nitra exhibition.

ILE SAS participates annually on agricultural exhibition Agrokomplex in Nitra. Part of the presentation of ILE SAS p. r. i. was “Science for farmers” seminar that we organized in cooperation with Slovak University of Agriculture in Nitra (SUA) and Constantine the Philosopher University in Nitra (CPU). Topics were: Precise agriculture and Historical Structures of Agricultural Landscape in Slovakia. During presentation of Vladimír Rataj from CPU and Andrej Halabuk from ILE SAS participants learned how to achieve a maximum efficiency of agricultural production, how to map soil environment, weed, diseases and pests occurrence, field crop harvest and how to correctly dose fertilizers, pesticides and other protective measurements. László Miklós from ILE SAS, had presented predictive system for vine protection developed in ILE SAS, that is a result of international cooperation with Budapest University of Technology and Economics. Marta Dobrovodská and Jana Špulerová, senior scientists from ILE SAS, had pointed out importance of historical structures of agricultural landscape from environmental, cultural-historical and socio-economic point of view.

Presentations of scientific monograph “Pavúky Slovenska” (“Spiders of Slovakia”).

Spiders are popular, beautiful and very important group of animals. This contrasts a little with negative attitude, even phobia of a part of public. The reason is a lack of information about spiders in Slovakia. Scientific publication “Pavúky Slovenska” of Peter Gajdoš, Ľudmila Černecká, Valerián Franc and Anna Šestáková is trying to fill this gap in knowledge. It was published in VEDA publishing house and on 23rd of July 2018 authors presented it in Small congress centre SAS in Bratislava (Slovakia). Readers will learn how many species of spiders live in Slovakia and what their role in nature is. They will find a list of spider families, current list of spiders living in Slovakia and many more.

Exploring green islands in cities. Green Week Europe – Green cities, green future

Within event of European Union GREEN WEEK 2018 Green cities – green future prepared ILE SAS p. r. i. program for preschool children on 25th of May 2018. Aim of this event was to explore “green islands” in the city. According to survey, 67 percent of European Union inhabitants live less than 5 km from natural areas or “islands”. Researchers from ILE SAS p. r. i. Milena Moyzeová, Ivana Kozelová and Daniela Hutárová with children from kindergarten visited first public park in Central Europe – Sad Janka Kráľa in Bratislava. They have explained to the children which trees are planted in parks and why are trees important for people and animals. By competitions and physical activities, they have taught children to perceive a tree as a living space of animals – in its canopy, branches, cavities and trunk.

Expositions and presentations of ILE SAS, p. r. i. at exhibition Natur Expo Brno - Fair for Sustainable Living in the Landscape.

Part of the NATUR EXPO BRNO 2017 was a conference “Climate Change – Threat or Opportunity for our Landscape” focused on the impact of climate change on agriculture. Various professionals and scientists from the field of climate change research, and representatives of municipalities and cities participated on this conference. Zita Izakovičová and Juraj Lieskovský have presented research results of ILE SAS, p. r. i. “Development of predictive system for vine protection” and “Use of satellite images from Sentinel 2 for evaluation of condition of agricultural crops”. Visitors could see an exhibition stall of ILE SAS, p. r. i. aimed on effective use and protection of natural

resources and potentials of agricultural landscape (11. – 14.5. 2017 in Brno, Czech Republic).

Presentation on scientific conference Landscape for sustainable beekeeping as a part of exhibition “Honey of the year 2017” in Brno, Czech republic.

Public presentation of researchers from ILE SAS, p. r. i. Milena Moyzeová and Jana Špulerová “Importance and benefits of bees for ecosystem and landscape research” was interesting for active beekeepers and professionals from the field of management and protection of landscape.

Exposition of ILE SAS, p. r. i. – Landscape from the clouds, European Researchers' Night 2017, 29th of September 2017 in Bratislava (Stará tržnica).

The name of our exhibition stall was “Landscape from the clouds”. We have presented here possibilities of remote sensing for landscape research. Our researchers and PhD. Students P. Kenderessy, A. Palaj and I. Laco had presented unmanned aerial vehicle – drone used for earth surface imaging. They also presented devices for gaining information about earth surface and landscape – optical camera, laser scanner, thermal camera, multispectral scanner etc. Young visitors learned in a playful quiz about possibilities of using unmanned aerial vehicles for environmental research.

Other selected media appearances (press, radio, television):

- Juraj Lieskovský: Hýbacie obrázky pre NASA (Moving images for NASA), STV - magazín VAT (Slovak television - Science and Technology magazine), <https://www.rtvs.sk/televizia/archiv/14067/111343#542>, 19.11.2016
- Zita Izakovičová: Historické štruktúry poľnohospodárskej krajiny SR (Historical Structures of Agricultural Landscape), Sro (Radio Slovakia), 18.8.2017
- László Miklós: Rozhovor o smogu (Conversation about smog), www.vedanadosah.sk, e-noviny www.vedeckykaleidoskop.cvtisr.sk
- Zita Izakovičová: Ekofarmy pomáhajú klíme (Eco-farms are helping climate) - Správy STV (Slovak Television News), 27.10.2021
- Peter Gajdoš: Rozhovor o pavúkoch (Discussion about spiders), Denník N (the daily newspaper N), 24.7.2018
- Henrik Kalivoda: Rozhovor o úbytku motýľov (Discussion about the decrease of butterflies), Český rozhlas (Czech Radio) - 29.8.2018

2.7.2. Table of outreach activities according to institute annual reports

Outreach activities	2016	2017	2018	2019	2020	2021	total
Articles in press media/internet popularising results of science, in particular those achieved by the Organization	20	49	10	19	19	25	142
Appearances in telecommunication media popularising results of science, in particular those achieved by the Organization	4	7	5	6	5	10	37
Public popularisation lectures	21	33	27	31	31	16	159

2.8. Background and management. Infrastructure and human resources, incl. support and incentives for young researchers

2.8.1. Summary table of personnel

2.8.1.1. Professional qualification structure (as of 31 December 2021)

	Degree/rank				Research position		
	DrSc./DSc	CSc./PhD.	professor	docent/ assoc. prof.	I.	II.a.	II.b.
Male	1	17	2	1	1	12	6
Female	0	20	0	1	0	7	12

I. – director of research with a degree of doctor of science/DrSc.

II.a – Senior researcher

II.b – PhD holder/Postdoc

2.8.1.2. Age and gender structure of researchers (as of 31 December 2021)

Age structure of researchers	< 31		31-35		36-40		41-45		46-50		51-55		56-60		61-65		> 65	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Male	0,0	0,0	2,0	1,4	2,0	1,5	2,0	2,0	6,0	5,5	1,0	1,0	2,0	2,0	1,0	1,0	2,0	0,7
Female	0,0	0,0	1,0	1,0	0,0	0,0	7,0	6,8	3,0	2,5	3,0	3,0	1,0	1,0	3,0	3,0	0,0	0,0

A – number

B – FTE

2.8.2. Postdoctoral fellowships (list of positions with holder name, starting date, duration. Add brief information about each fellow's career path before and after receiving PhD degree, etc.)

2.8.2.1. MoRePro and SASPRO fellowships

-

2.8.2.2. Stefan Schwarz fellowships

-

2.8.2.3. Postdoctoral positions from other resources (specify)

Tomáš Rusňák – postdoc position is funded by the URANOS project from September 1, 2019 until now

Ivan Laco – postdoc position is funded by the DREAM project from September 1, 2020 until now

2.8.3. Important research infrastructure introduced during the evaluation period with the information about the sources of funding (max. 2 pages)

The substantial amount of investments was targeted towards upgrade of research infrastructure for GIS and remote sensing data processing. In Bratislava a new lab has been established. This required complete remodelling and refurbishing of two rooms including new electricity and IT network. The lab was then equipped with two workstations and two servers (application and data server) for storing and processing large amount of remote sensing and LIDAR data. Following the requirements from previous monitoring period identifying a need for upgrade and maintenance of software infrastructure and licensing, the lab has been also equipped with up to date GIS and remote sensing software including:

1. ArcGIS – upgrade of existing licensing and purchase of most recent version of ArcGIS Online GIS Professional Advanced ArcGIS Pro Extensions Bundle extending the software functionality.
2. ENVI – a software platform designed for image analysis and remote sensing data processing including ENVI Feature Extraction Module for object oriented classification, ENVI Deep Learning Module and ENVI Crop Science Module for crop vegetation analysis.

3. Pix4D – photogrammetric software for flight planning and data processing from UAV platforms. It is designed primarily for the creation of georeferenced orthophotomaps and 3D models. The software package also includes a module specifically focused on vegetation monitoring (Pix4D fields).

The whole infrastructure including extended data storage will be remotely accessible to ILE SAS employees.

Furthermore, a new equipment for UAV (Unmanned Aerial Vehicle) platform has been acquired. This included a new multispectral sensor MicaSense Altum, that captures synchronized multispectral, thermal, and panchromatic data for pixel-aligned outputs at high resolutions. The sensor was tested.

The total amount of investment represented 94 000 EUR covered by cross border project cooperation scheme between Slovakia and Austria Interreg SK-AT (ERDF-European Regional Development Fund) “Danube River Research and Management in Slovakia and Austria”. After completing this investment, the continuous process of building the Center for Applied Earth Observation has been accomplished. The centre will be officially opened by the end of 2022.

Despite the limited resources available for purchase of larger amount of field survey instrumentation due to restrictions adopted by structural funds, some new field equipment was acquired. In the years 2020-2021, 11 pieces of durable field-measuring devices of the fablet type, 1 piece of smart antennas for high-precision data collection were acquired. The durable fablet type devices enables the operation of the so-called offline user-configured editing services for fast collection of large amounts of field data on the state of agricultural land. The smart antenna is used for more accurate position corrections, while being compatible with new mobile devices (e.g. fablets). Furthermore, 6 high-performance workstations (PCs), 2 ultrabooks, 3 durable smartphones and small office equipment (10 external disks, 4 docking stations, 11 USB sticks, 11 memory cards, A4 printer, data projector etc.) were also purchased. The total cost of the purchased equipment came to 72 674 EUR supported by the Integrated Infrastructure Operational Programme funded by the ERDF (European Regional Development Fund), as part of the project “Scientific support of climate change adaptation in agriculture and mitigation of soil degradation”.

For the following period, we expect less investment in improving the infrastructure, and more of an investment in maintenance expenses linked to operation of instruments and laboratory devices (calibration sets, spare parts, re-calibration of sensors etc.).

Based on the proposed objectives for the institute’s development, it is necessary to ensure sufficient funds both for improvement of infrastructure and for maintenance and upgrade of the existing infrastructure. The research projects remain our main source of funding.

We plan to improve the infrastructure, instrumentation and technical equipment of the Institute, especially in the following respects:

- Improvement of the infrastructure in the research station Východná – renovation of both buildings, restoration of the laboratory for basic processing of field samples, improvement of the conference room and its equipment, and renovation of the on-site accommodation. We have made several efforts already to acquire funding for this through various project schemes, but were unsuccessful.
- Car fleet renovation (2 new vehicles to be purchased in 07/2022).
- Instrumentation improvement in the LTER (long term ecosystem research) sites run by the Institute.
- Gradual renovation of the laboratories and expansion of the equipment base for analysis of environmental variables. Special emphasis will be put on field instruments for mapping the vegetation and soil reflectance properties used for calibration and validation of remote sensing data.
- Minor upgrades of the equipment for field measurements.

2.9 Supplementary information and/or comments on all items 2.1 – 2.8 (max. 2 pages in total for the whole section)

3. Implementation of the recommendations from the previous evaluation period

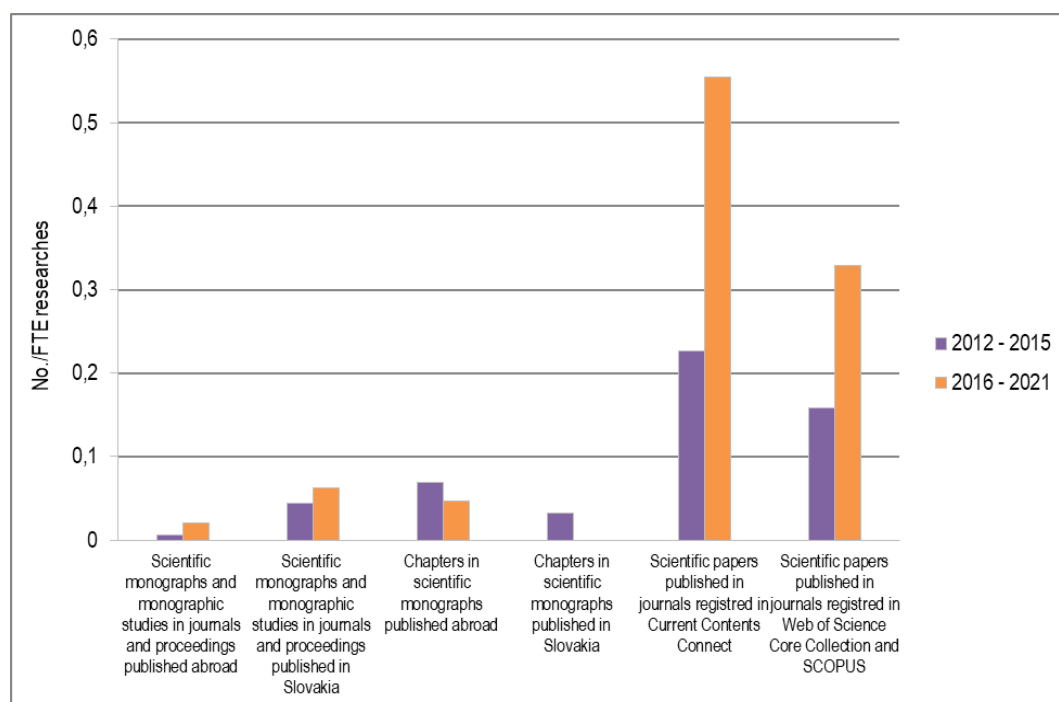
In 2016-2017, ILE SAS, like other SAV institutes, underwent regular accreditation evaluation. On the basis of the results of the accreditation, the Institute was categorised as an organisation whose research has a solid foundation and which has contributed to knowledge in the field at the European level. The organisation is visible at national level.

The most serious problems of the ILE SAS which were specified by the accreditation commission were:

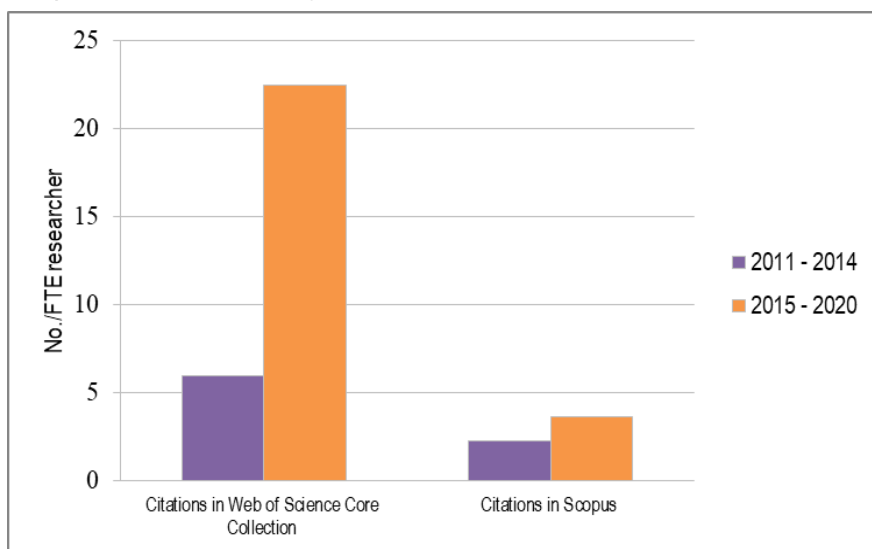
- Preference of publishing results in monographs and non-impacted journals over journals registered in prestigious databases, low publication activity of first-authored papers in journals registered in databases
- Weak internationalisation of doctoral studies - absence of foreign doctoral students, low participation of domestic doctoral students in foreign internships, low publication activity of doctoral students as well as supervisors in prestigious database journals
- Poor financial evaluation of PhD students and postdocs

In order to address the above-mentioned shortcomings, ILE SAS developed the ILE SAS Development Strategy, where it defined the basic strategic objectives and sub-objectives, which were subsequently specified in more detail in the Action Plan. The Action Plan specifies basic indicators and measures according to individual areas of activity of ILE SAS - publication activity, project activity, doctoral studies, personnel and technical support, popularisation and editorial activity. Following the implementation of the measures, we are gradually eliminating the shortcomings identified by the Accreditation Commission and we are succeeding in implementing the measures specified within the individual parts of the Action Plan:

Publication activity: the publication activity of ILE SAS staff has significantly improved, and we are more focused on publishing results in prestigious impacted journals. While in the years covered by the previous accreditation process we published on average 5 papers per year registered in the CC, WOS and SCOPUS databases, in 2021 we published up to 27 papers registered in CC and 5 papers registered in WOS/ SCOPUS. Of these, according to Scimago, 20 papers were in Q1, 5 in Q2, and 2 in Q3. The evolution of publication activity since the last accreditation is shown in the following graph (reflecting the number of publications per average full-time equivalent researcher).



Although the proportion of first-authored papers has also increased (about 1/3), most of our publications are still in large international collaborative groups, which stems from the nature of our work. Our laboratory is the landscape; landscape-ecological phenomena and processes are not bounded by administrative boundaries. Therefore, one of the forms that landscape-ecological research takes is that of studies carried out in international collaborations, monitoring and comparing phenomena in different types of landscapes. For ILE SAS it is an achievement and an honour to be included in such collaborations and to be able to carry out top-level research as part of international collaborative groups. While in 2015, our work had 425 citations recorded in WOS and 133 citations in SCOPUS, in 2020, our work received 1055 citations in WOS and 116 citations in SCOPUS, which is a significant increase. The number of citations in WOS has almost quadrupled compared to the previous accreditation, and the number of citations in SCOPUS has almost doubled. This is a consequence of publishing in higher quality journals registered in the WOS and SCOPUS databases. The comparison of citations for the previous and the current accreditation period is expressed in the following graph (reflecting the number of citations per average full-time equivalent researcher).



Doctoral studies are provided by 14 approved supervisors and are carried out jointly with the Faculty of Natural Sciences of the University of Constantine the Philosopher in Nitra, where we have established a joint workplace. The following were approved as SAS guarantors for doctoral studies: Ľ. Halada (guarantor for ecological and environmental sciences), Z. Izakovičová (guarantor for agriculture and landscape science) and R. Kanka (guarantor for biological sciences). As can be seen from the analysis of publication activity, the publication activity of supervisors has significantly improved and positive trends have also been noted in the publication activity of PhD students. In total, PhD students were authors or co-authors in 29 scientific articles registered in CC, WOS and SCOPUS publications, with 16 articles as first authors. PhD students and postdoctoral fellows participate in several foreign and contract projects, which contributes not only to their professional growth but also to their financial evaluation. We keep high quality students as postdocs after their PhD studies at the ILE SAS, and we have also kept a foreign student from Serbia.

4. Research strategy and future development of the institute for the next five years (Recommended 3 pages, max. 5 pages)

Research strategy of the institute in the national and international contexts, objectives, and methods (including the information on when the strategy was adopted)

The basic strategic goal of ILE SAS is to form a modern, dynamic and stable organization successfully established in the international research space, conducting cutting-edge, excellent research in the field of assessment of the landscape and its components, phenomena and processes. The basic priorities of the ILE SAS science policy have been set as:

- excellent and competitive research with an interdisciplinary basis,
- international reputation,
- creativity, innovation, professionalism,
- efficient use of human resources, professional development of staff, quality education of PhD students,
- efficient use and development of infrastructure,
- creation of a quality environment for creative work,
- continuous promotion and visibility of achievements, as well as the application of knowledge in practice.

The concept of the Institute of Landscape Ecology SAS should reflect its scientific background, respect the development of landscape ecology, and take into account the current state of landscape ecology as a science in the EU and the world, as well as visions and ideas for its future development. The Institute must continue to maintain its character as an interdisciplinary scientific centre for basic and applied research in the field of landscape ecology. Landscape ecological research must be carried out on an interdisciplinary basis. It must be based on the concept of landscape as a geoecosystem. Attention must be paid not only to analytical research on individual landscape components, but also to the creation of landscape-ecological syntheses and the creation of purpose-oriented landscape characteristics, which form the basis for the creation of proposals for the optimal and rational use of the landscape and its components. The overarching scientific focus will be integrated landscape management as a necessary tool for the implementation of sustainable development. The concept of the ILE SAS is determined by the ILE SAS Development Strategy, which defines the basic strategic objectives and sub-objectives, which are subsequently specified in more detail in the Action Plan.

The Institute's activities in the coming period will continue to build on the Institute's successful activities in basic and applied research and will continue to develop the theory and methods of landscape ecology, and to address problem areas related to research on the landscape and its components, as well as those related to research into phenomena and processes occurring in the landscape at different hierarchical levels. Our research will be oriented towards solving current societal problems, mainly in the environmental field.

The main research topics in the coming period will be based on the ongoing projects and will build on them. These will constitute the following research activities:

Long-term ecological research is carried out as a part of the International Long-Term Ecological Research Programme (ILTER, LTSE and eLTER), in which the Institute has been involved since 2002. The research will focus on investigating ecosystems and socio-ecological responses to globally-relevant environmental challenges in terms of ecosystem integrity and ecosystem services. The Institute will prioritise research at existing LTER and LTSE Slovakia sites and platforms. Activities will also include the completion of the infrastructure at the sites. ILE SAS will participate in the development of the pan-European Research Infrastructure (RI) of the ESFRI programme. The scientific intent of the eLTER RI has been endorsed by 162 research organisations by signing a Memorandum of Understanding, and 19 countries (including Slovakia) have formally provided political support for the establishment of the eLTER RI. eLTER RI will generate scientifically robust information needed to respond to major societal challenges, while operating as a distributed RI in the most cost-effective way. ILE SAS will ensure the establishment

and operation of eLTER RI in Slovakia.

Monitoring the development of global megatrends (GMT) and their impacts on the landscape and its components, and modelling development scenarios. ILE SAS will carry out research in the areas of global megatrends specified by the European Environment Agency (EEA) in Copenhagen and relevant for the territory of Slovakia. From the set of 11 GMTs that have been identified by the EEA, we will focus on a group of environmental GMTs: population trends and changes in urbanization rates and their impact on the landscape, increasing pressure on natural resources, ecosystems and environmental quality, and the increasing impact of climate change. The focus will be on assessing the impacts of climate change. Research topics related to climate change are currently being addressed at ILE SAS within the URANOS project and will continue in the coming period. Research activities in this area will mainly focus on:

- Production of new climate-related outputs, including regionally-specific scenarios of change in climate variables, and supporting the development of R&D infrastructure through the production of new data on the state of atmospheric and soil parameters based on outputs from measured, derived and modelled data
- Design of adaptation measures to prevent negative impacts due to climate change in agriculture, and establishment of objective measures to mitigate the negative impacts of climate change
- Assessment of the socio-economic and environmental impacts of climate change, and evaluation of the main impacts of projected changes and scenarios for the development of the agricultural landscape on its inhabitants, land users and their activities

Observing, monitoring and assessment of mountain flora affected by climate changes.

These activities will be realized within the follow-up activities of the project GLORIA (Global Observation and Research Initiative in Alpine Environments). A re-examination of the European mountain range summits in the GLORIA network will be carried out to extend the time period covered to 20 years. This research will follow exactly the same design and protocol as the previous research and will be carried out within one field season in order to adhere to a regular 7-year interval. These activities will be implemented in the form of a project "MICROCLIM – A micro-scale perspective on alpine floras under climate changes. Linking observation and models to improve our understanding of the future of European high mountain plants."

Monitoring of landscape changes, ecosystems, biotopes - this research will follow on from previous ILE SAS projects implemented under the Norwegian financial mechanisms, aimed at identification of representative landscape types and geoecosystems, and mapping and evaluation of historical structures of agricultural landscapes, as well as evaluation and mapping of biocultural landscape types in Slovakia. Both areal changes of individual landscape types and REPGES types, and their environmental and ecological impacts, will be assessed. We will also focus on the assessment of the basic drivers of these changes. The main activities in this area will be:

- *assessment of landscape changes* - monitoring landscape changes in different time horizons, assessment of the main temporal as well as spatial drivers of landscape changes, specification of the main negative impacts of these changes on the landscape and its ecosystems (assessment of the negative impact associated with land utilisation on the qualitative and quantitative characteristics of individual natural resources), and synthetic assessment of environmental quality, which represents the basic ecological conditions of the individual ecosystems.
- *ecosystem services (ES) assessment* - assessment of the potential of individual spatial units in terms of the potential for provision of ES as well as the demand for ES, and assessment of problems associated with inefficient use of ES. The results will form the basis for ecosystem accounting, to be implemented by individual EU countries, including Slovakia
- *monitoring of changes and development of Historical Structures of the Agricultural Landscape of Slovakia (HSAL)* - evaluation of changes compared to the first HSAL mapping (2010 - 2013), identification of factors influencing the origin of and causes of threats to HSAL, and proposal of measures for their protection and conservation. The results will form the basis for decision-making processes, whether for the protection of individual High Nature Value Farmland 2 (HNV2) or for the provision of subsidies within the

next programming period, and will be an essential resource for evaluating the effectiveness of the implementation of the Common Agricultural Policy Strategic Plan 2023-2027

Creation of research databases and use of advanced information and communication technologies - research within this field will be focused on data collection and evaluation for the preparation of timely, full-area information on the state of the landscape and the environment using remote sensing data. It will also include the completion of existing databases on the landscape and its individual components and the creation of user databases for decision-making processes. These activities will be continued in the framework of the URANOS project. We have also submitted a project to the Structural Funds in this area of research. We will focus on:

- *Developing innovative Remote Sensing (RS) techniques for generating timely information on the state of agricultural landscapes and agricultural vegetation, including retrospective analysis and predictive landscape modelling.*
- *Research into new techniques for processing, analysis and visualisation of derived data, automation of processing of remote sensing data and spatial modelling* - research into the possibilities of methods and innovative forms of visualisation of geospatial data comprehensively describing systems of different spatio-temporal dimensions.
- *Development and creation of on-line tools for decision support in the field of efficient use of the landscape and its individual landscape components (natural resources) for individual stakeholder groups as well as the general public*

In the field of applied research, we will continue to provide databases, data and expertise to international and national organisations, in particular in the following:

- *European Environmental Agency (EEA)* - via The European Topic Centre for Biological Diversity in support of the biodiversity directives (The Habitats Directive, The Birds Directive); assessment of biodiversity; assessment of the adequacy and effectiveness of protected areas.
- *DG Environment and CINEA* as the external monitoring team of the LIFE Programme
- *Ministry of Agriculture and Rural Development of the Slovak Republic* - monitoring of HNV 2 and assessing the effectiveness of the Strategic Agricultural Plan, and implementing the measures of the Action Plan for Climate Change.
- *Ministry of the Environment of the Slovak Republic* - the implementation of the evaluation of ecosystem services and ecosystem accounting, and implementation of the measures of the action plan for the protection of biodiversity.
- *Ministry of Finance and Ministry of Transport and Construction of the Slovak Republic* - assessing the impact of realisation of various activities on the environment, appropriate impact assessment on the territories of Natura 2000 sites, etc.
- *Ministry of Education, Research, Science and Sport of the Slovak Republic* - expert activities within the accreditation process of study programs.

For the implementation of cutting-edge research, it is necessary to ensure high-quality human potential as well as appropriate technical infrastructure. In terms of personnel, we are building an interdisciplinary team qualified for complex landscape research. All professions are proportionally represented, both for the analysis and evaluation of individual landscape components, and for the production of syntheses and interpretations. In recent years, our team has also been expanded to include experts in geographic information systems (GIS), information and communication technologies (ICT) and remote sensing (RS). In the period under review, we have expanded our team with four of our most successful PhD students, who, after completing their studies at the ILE SAS, were recruited to the position of ILE SAS Postdoc Research Fellow. We also pay attention to the professional growth of our staff: five employees have increased their qualifications by obtaining the scientific qualification degree IIa. The performance of individual staff members is financially rewarded in the form of personal allowances based on annual evaluations and rewards for participation and successful project solutions. In addition to financial remuneration, we motivate our staff by creating a suitable working environment, equipped with state-of-the-art technology and the opportunity to be an active part of the international research field by participating in international projects.

As regards research infrastructure, we have high quality laboratory equipment for complex landscape-ecological research, which we have obtained from structural funds, and we are constantly renewing and supplementing it from ongoing projects. We have built four laboratories: a GIS and Remote Sensing Laboratory (RS), a UAV laboratory, a field ecosystem research laboratory and a chemical analysis laboratory. The GIS and RS lab has hardware and licensed software that is capable of managing large datasets that arrive at regular intervals on the server. It also provides user-configurable processing, visualisation, reporting and publishing, including the ability to work with large raster formats and maps suitable for data and mapping services. The UAV lab is a comprehensive system capable of collecting different types of land surface data - hyperspectral, thermal and topographic. The basic component of this system is a carrying module with automatic and semi-automatic navigation capability for sensing the Earth's surface (an unmanned aerial vehicle, i.e. a drone). In addition, the system includes special equipment and software for ground surface sensing (hyperspectral scanner, thermal camera, laser scanner and multispectral camera) and processing of the obtained data. The terrestrial ecosystem laboratory is equipped with a photosynthesis evaluation system and a compact device for photochemical analyses, portable devices for non-destructive measurements of leaf area and other morphometric parameters of plants, a device for chlorophyll fluorescence determination, a device for leaf stomatal conductance measurements, a thermal camera for leaf surface temperature measurements, and a device for conductivity and magnetic susceptibility measurements of soils. The ILE SAS also has two comprehensive climate stations, which are complemented by air and soil temperature sensors, soil moisture and radiation sensors, and 3 stations which provide a forecasting system for vine protection. For the study of surface waters, the ILE SAS is equipped with a floating platform for monitoring the physical, chemical and biological parameters of waters. The laboratory for chemical analysis is equipped with sample preparation equipment (grinders, scales, dryers, mineralisation equipment, sterilisers and incubator). The laboratory is also equipped with a UV-VIS spectrophotometer with accessories and a multimeter for measuring pH, redox potential, temperature, and conductivity. This equipment creates suitable conditions for collecting data and carrying out research that can be compared internationally and across disciplinary boundaries.