

Newsletter

2/2021



CLIMATE CHANGE — THE DOMINANT THEME OF THE PAST YEAR

One of the most anticipated events of the year was the UN COP26 Climate Change Summit in Glasgow, which had been originally scheduled to take place last year, but was postponed due to a global pandemic. Nevertheless, the final timing of the conference probably could not have fallen at a more convenient time. We have become accustomed to the fact that recent climate change has brought extreme weather, especially in the summer months. However, what we have witnessed this year has surpassed all our previous experience. First, at the end of June, a deadly heat wave hit the northwestern United States and Canada, with the thermometer reaching 50 degrees Celsius. Hot weather was followed by extensive forest fires. At the same time, in our country we experienced a rampage of wind, which we had known so far rather indirectly from the media, because tornadoes regularly appear mainly in North America. The one that swept through South Moravia at the end of June manifested itself in an unprecedented destructive force, which meteorologists rated as F4 on a five-grade scale. Its track was 26 km long, devastating 6 villages and leaving 6 people dead and billions in property damage. However, the worst from Europe's perspective came in the second half of July, when prolonged heavy rains caused catastrophic floods in Germany, Belgium, the Netherlands and Austria. Here, the death toll was already in hundreds, and the damage was immense. Although some people argue that the floods have always been there, experts say that their intensity and frequency are amplified by climate change. According to the website Politico, experts consider it important that governments implement measures to slow down warming as soon as possible, while promoting investment in technologies and infrastructure that will reduce the effects of similar disasters. In early September, record breaking torrential rains caused by Hurricane

Ida literally washed over New York and part of the northeast coast of the United States. The local political leaders responded by saying that the climate crisis was evidently a reality and that it was the highest warning we could have received. It turned out that the previously rather reserved attitude of the US is beginning to turn slowly towards climate issues and measures to slow it down. All the more so when, in the same vein, President Biden also addressed the 76th UN General Assembly with climate change being an important issue. After all, the prelude to the necessary turn was the rejoining of the USA to the Paris Agreement immediately after the new president took office. Another milestone that could take the wind out of the sails of staunch climate sceptics was the announcement of this year's Nobel Prize in Physics, which was won by three scientists for creating physical models of the Earth's climate and for reliably predicting global warming. However, it is not only political leaders who have often been reluctant and unwilling to take action to save the climate. The expected wider use of renewable energy sources, the transition to new technologies in production and transport, but also the change in lifestyle associated with, for example, different eating habits, causes uncertainty in many people stemming mainly from fears of lowering their living standards. That is why our colleagues from the Department of the Human Dimension of Global Change have set themselves the difficult task of holding a series of four panel discussions "Climate change measures" addressing the general public ahead of the upcoming COP26 climate summit. Experts across disciplines (sociologists, climatologists, biologists, lawyers) illuminated the problems that CC brings, but also measures that could stop the unfavorable development of the Earth's state. The discussions were designed to appeal to the acceptance of personal responsibility

and to change the behavior of individuals, because the necessary changes can only be achieved with a responsible, voluntary bottom-up approach.

COP26 took place in Glasgow, Scotland, from 31st October till 13th November, and, as previously announced, it was not attended by some representatives of key world economies, such as China or Russia. Nevertheless, the summit saw several partial successes, although at the last minute the resolution eased the wording regarding the end of coal use, where instead of a fixed deadline, only a gradual reduction in coal use is mentioned. The conference was attended by two of our colleagues, who shared with us their findings and insights from COP26 in our Newsletter.

In the overflow of rather pessimistic news, we finally have good news, too. This is the fact that we have colleagues among us who are gaining recognition also in other ways besides publishing their research results in the most prestigious scientific journals. Dr. Suchá turned her nomination in the competition of the best work of young Czech scientists in the field of environmental and climate research for the year 2021 Make Our Planet Great Again awarded by the French Embassy into the second place. Dr. Kolanowska received the prestigious Maxwell / Hanrahan Foundation Award for 2021, which is awarded to young scientists for research in field biology. She received the award together with a prize of 100,000 dollars for documenting the most diverse families of flowering plants. And finally, a few days ago, Prof. Trnka became the Winner of the 2021 CC Communication Award, which was awarded to him by the UN Information Centers and the Learned Society of the Czech Republic.

These public awards, which signify the prestige of the scientists themselves as well as CzechGlobe, are also an encouragement for other colleagues that their work is indeed meaningful.

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Participants' insights from COP26

Mgr. Alexander Ač, Ph.D.

CzechGlobe's researcher. He specializes in isotope analyses of tree rings and inventory of greenhouse gas emissions from agricultural land. He is the co-editor of the book "Věk nerovnováhy" (The Age of Imbalance, Akademia, 2019) addressing the Global and Local Consequences of Climate Change and he is the translator of the book called Sustainable Energy - without the hot air (DJC MacKay, Cambridge, 2009).

In general, what were the expectations from COP26 and did they differ fundamentally from COP21 in Paris?

The main mission of the Glasgow conference was to agree on specific steps and measures that will lead to the fulfillment of the Paris commitments. It is already clear today that the vast majority of countries are not in a position to meet their Paris commitments successfully. In short, the difference between the two summits is that in Paris we were told what we wanted to achieve, and in Glasgow we were supposed to be told how we wanted to achieve it.

Was also the fulfillment of the COP21 objectives assessed in Glasgow? And can we keep warming below 1.5°C?

The fulfillment of the COP21 objectives is evaluated on an ongoing basis in various documents and scientific studies. This was not the goal of COP26. However, at COP26 it was agreed that the assessment of progress

in climate change mitigation would take place yearly, instead of the five-year intervals agreed in Paris. Considering the current concentration of CO₂ in the atmosphere, there is already a significant probability that the warming will exceed 1.5°C. According to the median estimate, we have about 11 years to cross this limit if the emissions do not fall much. To have at least half a chance of not exceeding the 1.5°C threshold, emissions would have to fall globally at a rate comparable to that during a pandemic. Therefore, I believe that we will no longer meet this goal.

Are the new commitments - limiting methane production and halting deforestation by 2030 - strong enough to reduce emissions, especially as the conditions for fossil fuel use have been relaxed under pressure from China and India and, in addition, these two countries have delayed the shift away from burning coal?

Limiting methane is key to meeting the Paris Agreement commitments, as is halting deforestation. Even if the Glasgow commitments were met, a more moderate target of keeping warming below 2°C would be more realistic, as these commitments are not enough for the 1.5°C threshold. However, it is not at all certain whether this will succeed, as commitments to slow down deforestation have failed in the past. In terms of reducing coal use, India was the only major player to announce a tightening of its contribution to mitigating global warming by announcing a shift away from coal. If it were to honor its commitment, it would mean for the world that the goal of keeping warming below

2°C would be more realistic. The „easing“ of the rhetoric in the final document was thus perhaps more the result of the failure of rich countries, which failed to support the ambition of poorer countries to reduce coal by increasing financial aid for this energy transformation. So the poorer countries are not probably to blame completely. Nevertheless, I still perceive the new commitments as relatively drastic; unfortunately, the legislative framework on how they should be implemented is again lacking. In this sense, I believe that Glasgow can be considered a failure.

Measures to stop global warming will be very costly... Can the large presence of the world's industrialists and financiers at the summit give rise to a slight optimism that money will be found to save the climate?

You are right, the costs will be enormous, but still many times lower than the damage that could occur if the problem of warming spiraled out of our control, but also if we postponed the measures. Financiers and industry representatives must be part of the solution, so it is good that they were present in Glasgow. However, their ambition to contribute to the solution must be higher and, most importantly, it is not possible to oppose systemic solutions, such as stopping subsidies to fossil resources, charging for their consumption, etc. If the private sector itself were to come up with a proposal for a systemic measure, I think that would be a much greater source for optimism than their mere participation in this conference.

Mgr. Jiří Kolman, Ph.D.

CzechGlobe's Scientific Secretary. He studied Law, International Relations and European Studies. He is engaged in scientific management, career development support, international cooperation, transfer of know-how, cooperation in the form of open access.

What was the atmosphere of the Glasgow conference you attended in person like? Was it a formal official meeting or a real effort to improve things?

The conference consisted of several parts. The first was a two-day inaugural world summit of top state officials, prime ministers and presidents. Then, the meetings of government delegates took place and, in parallel, professional seminars were organized on various issues of the climate agenda as well as accompanying events open to the general public. The conference area included stands for delegations of some countries and international

organizations, i.e. it was a conference held together with a kind of „fair“. Various demonstrations and happenings took place at the conference site and in Glasgow itself. Since the introductory speech by the British Prime Minister Johnson, which, in my opinion, many environmental organizations would not have to be ashamed of, the conference has been in the spirit of active interest in finding a solution. Given the pandemic, it was an opportunity for most conference participants to meet in person after a long time and discuss, for example, specific adaptation and mitigation projects where stakeholders' trust is important. Thanks to the long-standing cooperation between CzechGlobe and the Ministry of the Environment of the Czech Republic, CzechGlobe had the opportunity to participate effectively in the COP, which is promising in terms of involving Czech research in the implementation of the climate goals of the Paris Agreement.

Was there a conference-related output that

slipped the Czech media attention and did not resonate here very much?

It is a pity that the Czech media did not cover the individual commitments and joint initiatives aimed at intensifying the fight against climate change of individual countries such as South Korea (to reduce their emissions by 40% compared to 2018) or African countries such as Tanzania (to reduce greenhouse gas emissions by 30-35% compared to the “business-as-usual” scenario) and Nigeria (to achieve zero emissions by 2050). In terms of initiatives, what is interesting is The Breakthrough Agenda, which aims to ensure the use of available clean technologies by 2030 (initiated by the United Kingdom and joined by 42 countries - including the US, India, the EU, China and a number of developing countries).

By that, I want to point out the fact that global climate change is really topical in countries all over the world and it is not a solo „green frenzy“ of the EU, as is widely interpreted in the Czech Republic.

SIGNIFICANT MILESTONES AND RESULTS OF CZECHGLOBE



Professor Natr's Experimental Station of Plant Ecophysiology

The experimental station with technical, administrative and training facilities was put into operation in Domanínec (district of Bystřice nad Pernštejnem) in June 2013.



The main experimental apparatus is a unique system of 24 outdoor chambers in which the effects of future climate on plant growth, physiology and production can be simulated. The chambers are small "greenhouses" into which air with higher CO₂ concentrations (typically 700 ppm expected at the end of this century) is blown. The chambers' roofs made of rotating lamellas provide ventilation and precipitation control. All controlled parameters are adjusted based on data from sensors and analyzers. The device thus makes it possible to monitor the effects of several factors simultaneously and provide answers to questions such as how drought, UV radiation or nitrogen nutrition affect the stimulation of photosynthesis by increased CO₂ concentration, or whether plants may be more sensitive to UV radiation, drought or to insect and fungal diseases at elevated CO₂ concentrations. An illustrative example of the use of experimental results in agricultural practice is the evaluation of the effects of a combination of changes in CO₂ concentration, drought and UV radiation on the baking or malting quality of cereal production.

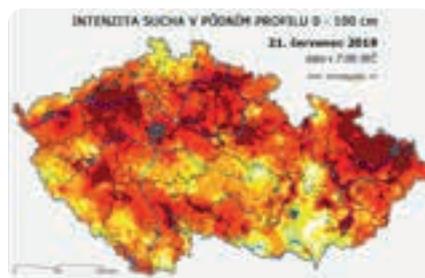
In addition to chamber experiments, the station is investigating the relationship between water balance and nutrition on the fluxes of substances in field experimental stands of agricultural crops and fast-growing woody plants. The results obtained are further used for the development and application of ecosystem models, remote sensing methods and other agro-climatological tools and practices.

Early warning web portals

A necessary condition for obtaining the CzechGlobe project from the Operational Programme RDI was to ensure the transfer and application of specific scientific knowledge in practice. Great successes have been achieved here by teams from the Climate Analysis and Modelling Domain, who have contributed significantly to the development of a number of web portals through which research results are received as valuable input for strategic decision-making and measures in the agricultural and forestry sector, in state and local government and by the general public. The INTERSUCHO.CZ portal has become widely known, and the Klimatickazmena.cz portal is also well acknowledged. Other applications are early warning portals for monitoring the state of vegetation and yields (VYNOSY-PLODIN.CZ, FENOFAZE.CZ), monitoring abiotic and biotic risks for agricultural crops (AGRORISK.CZ) and fire risks (FIRERISK.CZ).

INTERSUCHO.CZ

The Integrated Drought Monitoring System (IDMS/ISSS) providing on-line forecasts of agricultural drought, information on agricultural drought and the state of vegetation has been developed through interdisciplinary cooperation of scientists from the GCRI, Mendel University, Masaryk University and the Czech Hydrometeorological Institute and is currently operated in cooperation with the Land Fund of the Czech Republic. It combines data from ground measurements, a dynamic water balance model, remote sensing methods and observations from a broad network of reporters.



To assess agricultural drought and its impact on yields, the IDMS is updated every Monday and provides data on soil moisture and drought levels as deviations from long-term state, satellite outputs to assess vegetation state, as well as drought forecast. For drought and soil moisture intensity

forecasts, it updates maps daily with a view to the next 9 days and other long-term forecasts. The network of observers from agricultural, forestry, forest nursery and wine practices plays an irreplaceable role in the functioning of the IDMS. They provide regular reports on the current state of drought and its effects on agricultural production and assess the situation from their own point of view and directly for their own location and crops they cultivate.

AGRORISK.CZ



AGRORISK.CZ is an online forecasting and monitoring system focused on selected biotic and abiotic factors reducing or threatening crop yields. The system was created and is operated by the staff of GCRI, Mendel University, The Crop Research Institute and CHMI.

Biotic risks are the expected or current occurrence of pests and pathogens. Air temperature, relative humidity, the length of leaf wetting and the amount of rainfall, as well as other weather characteristics are the basis for forecasting their occurrence, which is crucial for protective action against them.

Abiotic risks of agricultural crops are physical and chemical environmental factors (weather factors, soil factors, immissions, environmental pollution or inappropriately chosen agro-technical interventions) that adversely affect plants, their growth, development, reproduction and product quality. The predictions allow farmers to estimate the degree of risk of the occurrence of a harmful agent and subsequently they can make an informed decision on the implementation of protective and preventive measures.

A NEW ANALYSIS OF GLOBAL TEMPERATURE ACROSS THE PAST 24,000 YEARS

GOT OUR ATTENTION

To properly understand the climate future, it is important to have the most accurate picture possible of past climate developments. Paleoclimatologists are constantly coming up with new, more complete and accurate data. The current prevailing notion of an unusually stable Holocene climate (the youngest geological period - the Quaternary, from about 9700 BC to the present day), during which the global temperature dropped very gradually, has been seriously challenged. If the new results of Osman and his team, published by the prestigious journal *Nature*, are confirmed by further work, the unprecedented nature of the current warming compared to the past will be even more convincing. Seven authors of the study, led by Matthew Osman of the University of Arizona, have come up with a new reconstruction of global temperature across the past 24,000 years. One of the most important benefits of the study is a reanalysis of the development of global temperature, which will really

help researchers studying changes in the oceans, ice, vegetation, and atmosphere since the end of the last ice age. Interestingly enough, this analysis is consistent with previous results, which were derived from a much smaller volume of data. This could indicate that in order to obtain sufficiently representative results of the global temperature trend, it is sufficient to have records from several key locations. Another important finding is that during the Holocene, the effect of stronger solar radiation in the summer was eliminated by lower temperatures in other periods. By this the authors of the study partially contradict the conclusions of Milutin Milankovič's century-long hypothesis of the existence of climatic cycles related to cyclical orbital movements of the Earth. The result of the new reconstruction is a new picture of the Holocene, during which the temperature rises very slightly, with multiple confirmations of rapid growth from the end of the 19th century to the present (Fig. 1).

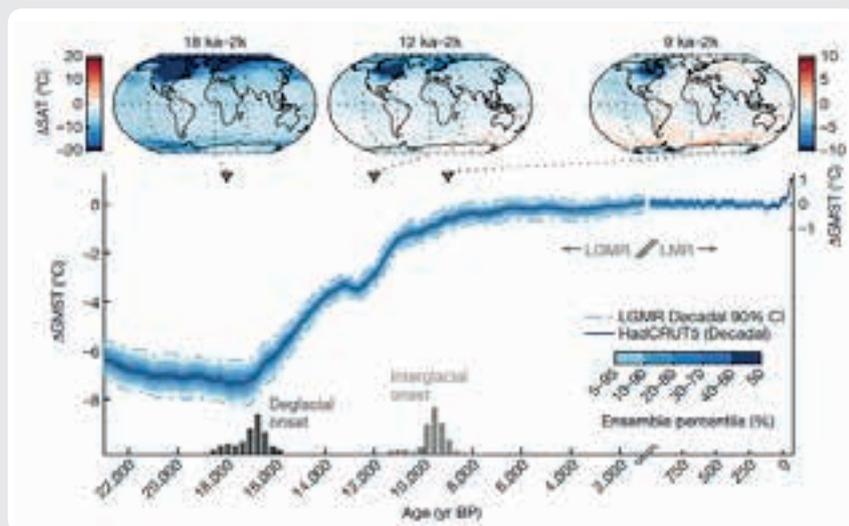


Fig. 1: A new reconstruction of global temperature for the last 24,000 years. The end of the last Ice Age was colder by more than 6°C, and the Holocene is characterized by a very stable, slightly rising temperature until the beginning of the Industrial Revolution. (Osman et al., 2021).

Another important contribution of Osman's work lies in the combination of the existing approach of paleoclimatologists, who focused either on a short period of time, but with a detailed spatial record, or on the contrary on a longer time record, with a smaller volume of data on a spatial scale. Naturally, neither this reconstruction is definitive in terms of understanding the climate development during this period, as it does not contain a record of temperature over the continents and there is only a limited amount of data from the Central Pacific, Indian or Southern Ocean. In addition, the determined

resulting global temperature is based on only one climate model, which can also distort reality because different models give different outputs. This analysis also goes against the results of a recent study that used hundreds of reconstructions from ground-based sites. Regardless, this is crucial work raising the standard of how scientists will approach similar analyzes in the future.

Reference:
Osman M. et al., 2021, *Nature*:
<https://www.nature.com/articles/d41586-021-03011-6>

WHAT'S NEW

Delegation of the Embassy of Ghana visiting the GCRI

On July 29, 2021, a delegation of the Embassy of the Republic of Ghana in the Czech Republic headed by the head of the office, Mr. Peter Manu Owusu, visited GCRI. With CzechGlobe representatives they discussed research activities in the Bia-Tano Reserve in Ghana, where CzechGlobe, in cooperation with the University of Energy and Natural Resources in Sunyani, built an experimental station for measuring greenhouse gases and meteorological parameters. Equipped with a 70-meter-high measuring tower, the station represents a tropical rainforest in a network of ecosystem stations. An important item on the agenda was the signing of the extension of the Memorandum of Cooperation between the two institutions.

Researchers' night

On September 24, 2021, another year of the European Researchers' Night took place. Its theme in the Czech Republic was time. Traditionally, CzechGlobe also joined the event, enabling those of all ages to visit the experimental station at Bílý Kříž and laboratories in Brno. In connection with the theme of time, visitors were able to learn about the issue of climate change, which as one of the greatest threats to humanity has a prominent place on the Doomsday Clock, and to see how a combination of scientific approaches helps us read the past from the rings of trees. Nature lovers and observers learned how climate change has altered the onset of plant phenological phases over the years or how time affects the results of experimental measurements in ecosystems.

Week of the CAS

From 1st till 7th November 2021, the first year of the Week of the Czech Academy of Sciences took place. It followed on from the previously successful Science and Technology Week. As part of the new science festival, which is to be a holiday and celebration of the Academy of Sciences, the GCRI, in addition to guided tours, presented a series of five lectures on the interdisciplinarity of the Institute. Visitors gained information on airborne remote sensing, the effects of climate change in Central Europe, drought monitoring and forecasting, floods in Europe over the past 500 years, and the use of stable isotope analysis in plants to reconstruct ancient climate.

The supplement to Newsletter 2/2021 presents a selection of interesting 2021 publications by CzechGlobe researchers.

Lehnert, M., Brabec, M., Jurek, M., Tokar, V., **Geletič, J.** The role of blue and green infrastructure in thermal sensation in public urban areas: A case study of summer days in four Czech cities. *Sustainable Cities and Society* 2021, 66(Mar), 102683. ISSN 2210-6707.

Thermal comfort in public spaces, as an important factor in the quality of life, has been strongly affected by manifestations of climate change. City authorities are under pressure to adapt their approaches to the urban environment. This study investigates thermal sensation in public spaces in four Czech cities. Biometeorological measurements were taken and biometeorological indices (UTCI, PET, HUMIDEX) established, then contrasted with questionnaire surveys (thermal sensation vote – TSV). Regression models were subsequently constructed to explore the influences of elements of blue and green infrastructure beyond their microclimatic functions. The results suggest a highly complex relationship between biometeorological indices and TSV in urban environments, significantly influenced by specificity of place and time. Open grassy areas exhibit a lower probability of higher TSV related to heat stress. Despite measured microclimatic effects that might indicate the opposite, the probability of TSV-related heat stress is higher under trees and near sprayed water-mist. The findings herein thus indicate that simple predicted mean vote models are of little or no use in urban planning, and that sensitive and sustainable planning of heat mitigation measures should reflect the behavioral patterns of citizens alongside the microclimatic effects in the actual place.

Mbengue, S., Zíková N., Schwarz, J., Vodička, P., Holubová, A., **Holoubek, I.** Mass absorption cross-section and absorption enhancement from long term black and elemental carbon measurements: A rural background station in Central Europe. *Science of the Total Environment* 2021, 794(Nov): 1-14. 148365. ISSN 0048-9697. E-ISSN 1879-1026.

Black carbon (BC) is the main light-absorbing atmospheric aerosol component and ranks second among climate forcing agents after carbon dioxide. This article presents a detailed aerosol light absorption characteristic based on long-term (2013-2017) field measurements of black and elemental carbon at the National Atmospheric Observatory Košetice, a Central European rural and regional background site in the Czech Republic. The mass absorption cross-section of BC (MACBC) is a fundamental input for climate modelling defining the absorption efficiency of BC per unit mass. It was investigated considering different time scales (yearly, seasonal, diurnal variations) and wavelengths. The light absorption enhancement and the influence of Brown Carbon attributed absorption were estimated combining different approaches applicable for the long-term field campaigns. The absorption coefficient and MACBC exhibited different temporal behaviors in relation to the fluctuation in terms of emission sources, size distribution aerosols and their atmospheric aging. A Source apportionment study based on receptor modeling identified the light-absorbing coating materials formed during atmospheric aging as a major driver of the MACBC measured at the regional background site. These kinds of studies using long term field measurement data are needed to better understand and estimate the uncertainty related to the radiative effect of atmospheric aerosols and could be of great interest to researchers dealing with atmospheric chemistry and physics, climate change and air quality as well as for policy makers.

Kolanowska, M., Michalska, E., Konowalik, K. The impact of global warming on the niches and pollinator availability of sexually deceptive orchid with a single pollen vector. *Science of The Total Environment* 2021, 795 (15 November). 148850.

Orchids are among the most endangered plants in the world. It is accentuated by the fact that there are very specific relationships between orchids and their pollinators. The most vulnerable are species dependent on a single pollinator, including *Leporella fimbriata*. This orchid found in South Australia is completely dependent on the pollination of male winged ants *Myrmecia urens*. Pollination occurs due to the sexual deception by the orchid - the male ant confuses the orchid flower with its female and tries to “fertilize it” while pollinating the orchid.

A study by a team of scientists led by Marta Kolanowska from CzechGlobe, published in the journal *Science of the Total Environment*, focused on estimating the future distribution of suitable niches for this orchid and its pollinator using three machine learning algorithms. The results show that, depending on the algorithm, the pollinator will lose more or less suitable niches. At the same time, due to global warming, it is most likely that the orchid's flowering phase and the mating time of the ant will not be time-synchronized. This will reduce the likelihood of successful reproduction of *Leporella fimbriata* and increase the risk of its extinction.

Mander, Ü., Krasnova, A., Escuer-Gatius, J., Espenberg, M., **Schindler, T., Machacova, K.,** Pärn, J., Maddison, M., Megonigal, J.P., Pihlatie, M., Kasak, K., Niinemets, Ü., Junninen, H., **Soosaar, K.** Forest canopy mitigates soil N₂O emission during hot moments. *npj Climate and Atmospheric Science* 2021, 4: 39. <https://doi.org/10.1038/s41612-021-00194-7>.

International research team led by researchers from the University of Tartu, Estonia, and the Global Change Research Institute of the Czech Academy of Sciences has revealed that the so called “hot moments”, i.e. “short-term” extreme events of nitrous oxide (N₂O) emission, contribute more than half of total soil N₂O fluxes in a typical riparian forest in Europe. The results were published in *npj Climate and Atmospheric Science* belonging to Nature group in July 2021. Nitrous oxide, an important greenhouse gas, is naturally produced in soils and exchanged with the atmosphere at the soil surface. Riparian forests are known as hot spots of nitrogen cycling in landscapes and can be important N₂O sources. Global climate change speeds up the cycle. The authors present results from a multi-annual high temporal-frequency study of soil (automated soil chamber measurements), tree stem (manual tree stem chamber measurements), and ecosystem (eddy covariance method) fluxes of N₂O from a typical riparian forest in Estonia. Long-term measurements revealed that changes in soil moisture and freeze–thaw cycles induce “hot moments” that produce most of the N₂O emitted by soil. This, however, does not reach the top of the canopy, but is largely processed in the canopy by an unknown mechanism. The measurements of the ecosystem N₂O exchange showed that even though the soil is a high N₂O emitter, the riparian forest is “only” a modest source of N₂O. The authors underline the crucial importance of further analysis of the still overlooked canopy role in the N₂O budget of different forest ecosystems to better estimate the global N₂O flux balance, based on which the appropriate measures to reduce concentrations of greenhouse gases in the atmosphere are proposed.

Jakubínský, J., Prokopová, M., Raška, M., **Salvati, L.,** Bezak, N., **Cudlín, O., Cudlín, P., Purkyt, J.,** Vezza, P., Camporeale, C., **Daněk, J.,** Pástor, M., Lepeska, T. Managing floodplains using nature-based solutions to support multiple ecosystem functions and services. *Wiley Interdisciplinary Reviews-Water* 2021, 8(5). e1545.

The article summarizes the main results of research focused primarily on the issue of ecosystem functions provided by the river floodplains. An important aspect of the study of alluvial ecosystems is their definition, which is most often based on hydrological or soil data (i.e. extent of floodplains or fluvially conditioned soil types lining watercourses). Prior analyses show that the most accurate results can be achieved using a combination of both data sources. The existence of a map capturing the extent of floodplains at the national level would mean a significant shift, but unfortunately such a dataset still does not exist in the Czech Republic. A key part of the article is a list of the most important ecosystem functions performed by floodplains in the conditions of Central and Southern Europe and relevant indicators that can be used to express the quality of performance of individual ecosystem functions. Based on an extensive search of literature and data sources, the authors of the study identified the main causes of degradation of the river floodplains as well as appropriate measures suitable to mitigate the impacts of individual anthropogenic impacts on floodplain ecosystems. One of the main issues associated with the implementation of measures that can contribute to improving the ecological status of riparian habitats and floodplains is most often the very low social acceptability of these measures, especially by landowners as key players. The article presents the result of multidisciplinary cooperation (also within the CzechGlobe), which is necessary for the needs of quality and effective research of river ecosystems.

Baďura, T., Lorencová, E., Ferrini, S., Vačkářů, D. Public support for urban climate adaptation policy through nature-based solutions in Prague. *Landscape and Urban Planning* 2021, 215(Nov): 1-15. 104215. ISSN 0169-2046.

The impacts of climate change on urban life, which include heat waves and flash floods, require response in terms of adaptation planning. Nature based solutions (NBS) focus on the multi-functionality of green and blue infrastructure interventions that can contribute to both adaptation to and mitigation of climate change that can provide cost-effective solutions also for other urban problems. But do citizens support nature-based adaptation planning? And if so, can we understand the economic preferences for NBS policies in such a way that would be useful to urban planners? These questions were the drivers of a new study from CzechGlobe, published in September in journal *Landscape and Urban Planning*. The study used an online survey instrument and a choice experiment – a technique used by environmental economist for estimating values for non-market goods and services such as nature based solutions. Four major messages arose from the analysis of the survey data collected from representative sample of Prague citizens (n = 525): (1) the NBS policy is widely supported by the public over the status quo, and this preference is mirrored in the citizens' concerns about climate change and the risks posed by heat waves in particular, (2) species diversity matters in the portrayed scenarios, suggesting that (bio)diverse NBS generate additional public value over single-species measures and that policy which targets biodiversity may gain support, (3) implementation of NBS in public spaces (e.g., street trees, rain gardens) is preferred over measures implemented on public buildings (green roofs and facades), and that (4) adverse experiences with heat waves have increased support and willingness to pay for the policy. The presented results provide evidence that adaptation planning through NBS is likely to generate significant economic public value, which is expected to increase with the intensifying effects of climate change.