

NATIONAL MULTIDISCIPLINARY LABORATORY FOR CLIMATE CHANGE

CLIMATE CHANGE: INTEGRATED SCIENCE FOR BETTER ADAPTABILITY

The activities of the National Multidisciplinary Laboratory for Climate Change include the study of the drivers of climate change and their impacts on natural and economic systems and society, as well as research and development in the field of technological and social adaptation.



MAIN RESEARCH AREAS

- Climate change drivers and their impacts
- Climate impacts of soot particles
- Planktonic organisms and climate change
- Impact of climate change on chemical communication in living waters
- Biodiversity conservation research
- Experimental investigation of changes in ecological systems
- Clay sediments and bio-minerals
- Biobatteries

 **National Laboratory
for Climate Change**

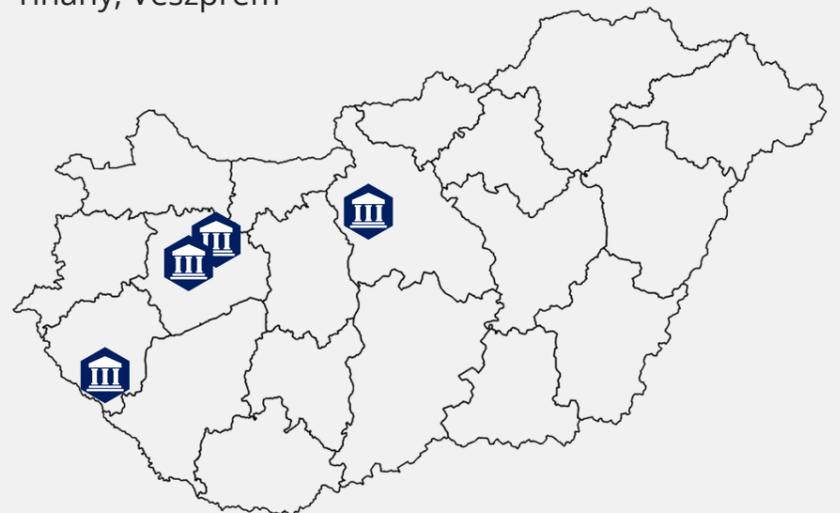
CONSORTIUM LEADER:

University of Pannonia

CONSORTIUM PARTNERS:

Centre for Ecological Research
Balaton Limnological Research Institute

PLACES OF IMPLEMENTATION: Budapest, Nagykanizsa,
Tihany, Veszprém



BENEFITS TO BE EXPECTED FROM LABORATORY RESEARCH

- To identify hitherto unregulated sources of soot particles, in particular to estimate the extent of illegal municipal waste incineration, to determine the chemical and absorption properties of the particles, to quantify their energetic contribution to climate change, and to contribute to industrial combustion technology developments to minimise soot emissions.
- The combined effects of climate change-induced temperature extremes and anthropogenic stressors in freshwater ecosystems, focusing, among other things, on chemical communication in trophic networks of ecosystems.
- Clarifying the potential role of biofossils (shellfish shells, fish ear bones) as environmental and climate indicators.
- Bioelectrochemical systems developed today (microbial fuel cells (MFC), microbial electrolysis cells (MEC) and microbial electrosynthesis cell (MESCs)) are capable of both storing and harvesting electricity. Their integrated application helps to develop a system analogous to batteries, which can even be used for carbon sequestration.
- Provision of analyses and development of decision-support solutions using data and systems science to identify the challenges and management options of climate change to assess the climate sensitivity of communities, improve the resilience of the environment and society, and improve the adaptive, transformative and learning capacities of individuals, communities, supply networks and communities.
- Monitoring the complex impacts of climate change.
- Development of the Water 4.0 research infrastructure system to address the expected water supply problems in the context of climate change, enabling the automation, remote access and operation of various water treatment tasks in both new and existing water systems.

THE PROFESSIONAL TEAM

András Gelencsér DSc, Head of National Laboratory, atmospheric chemist, academician, professor, head of the MTA-PE Air Chemistry Research Group since 2005. His research focusses on the sources, properties and atmospheric role of carbonaceous aerosol particles. He published a 360-page monograph titled Carbonaceous Aerosol at Springer in 2004 <https://www.springer.com/gp/book/9781402028861>. He has been PI of 14 research projects amounting to a total of 90 million EUR. He has published 87 publications in peer-reviewed journals, cumulative IFs 208, number of SCI citations: 5480, Hirsch-index: 37. He is a member of the editorial board of Journal of Atmospheric Chemistry. He has received many awards during his scientific career. He has cooperated with top researchers from the Max Planck Institute for Chemistry, TU Wien, University of Antwerp, Desert Research Institute, Lawrence Berkeley National Laboratory, among others.

János Abonyi DSc, leader of the MTA-PE Complex systems monitoring research group. Engineering applications, sustainability and process management. More than 250 publications, author of seven books among them, >2700 independent SCI citations.

Péter Bakonyi PhD, senior researcher, main profile of his scientific work is the membrane bioelectrochemical systems. His main goal is to study the role of membranes in the microbial fuel cells and other, similar cells. In the frame of his work novel type ionic liquids, and other polymer membranes have been investigated by various electrochemical, physical, microbiological methods. As a result he has got 80 high impact publications, its cumulated impact factor is > 320, with more than 1200 citations, his H index is 21. He is the supervisor of one PhD student now.

Zsófia Horváth PhD, is a community ecologist, working primarily in the field of metacommunity ecology and with plankton communities of ponds, with the help of empirical and experimental approaches. Between 2012 and 2020, she was a postdoc at WasserCluster Lunz (Austria), with shorter contracts at iDiv (German Centre for Integrative Biodiversity Research, Halle-Jena-Leipzig, Germany; 2018) and KU Leuven (Belgium; 2019). Currently she is the leader of the Biodiversity and Metacommunity Ecology Research Group at the Institute of Aquatic Ecology of CER and a guest researcher at KU Leuven.



THE PROFESSIONAL TEAM

Katalin Bélafi-Bakó DSc, director of the Research Institute on Bioengineering, Membrane Technology and Energetics at University of Pannonia since 2010. She got her PhD in 1996 at Technical University of Budapest. In the focus of her scientific work there are membrane separation techniques, enzymatic and microbiological processes and integrated systems. Her membrane group has been dealing – as the only one in Hungary – with the complex investigation of these operations, both from theoretical and application points of view. As a results of her research work she has got 172 publications, its cumulated impact factor is 301, with more than 3000 citations. She has 9 approved patent applications, and 14 PhD graduates.

Gábor Bernát PhD, worked for the Institute of Plant Biology in the Biological Research Center, Szeged from 1991 to 1999, then, from 1999 to 2017 he worked for well-established universities and research institutes abroad (University of Lille, France; Lund University, Sweden, Marie Curie Fellow; Leibniz -Institute for Neurobiology, Magdeburg, Germany, Marie Curie Fellow; Ruhr-University Bochum, Germany; Uppsala University, Sweden; Institute of Microbiology, Czech Academy of Sciences). From 2019 he is the head of the General Limnology Research Group and the Department of Limnoecology. He is an author of 37 articles and 3 book chapters (H = 19), with more than 950 independent citations.

Viktória Csizmadiáné Czuppon PhD, is an associate professor at the Department of Business Economics, Faculty of Business and Economics, University of Pannonia, since 2014. The PhD research focused on the Socio-economic indicators' usage in micros regions' analysis. She has an experience in regional development, rural development and local economic development as well. Her field of research is the exploration of the possibilities of local economic development, the role of local products in increasing the supply capacity and sustainability of the countryside.

András Hoffer PhD, chemist, senior researcher at the MTA-PE Air Chemistry Research Group. He has received his PhD in 2003. In the period between 2000 and 2006 he was a postdoc in the Max Planck Institute for Chemistry Mainz. He has published 51 publications in peer-reviewed journals, cumulative IFs 125, number of SCI citations: 2255, Hirsch-index: 27.

Ildikó Galambos PhD, associate professor, leader or participant both in projects and industrial R&D works. Member of Hungarian and international professional organizations (International Humic Substance Society, Hungarian Chamber of Commerce and Industry, Hungarian Chamber of Engineers) resp. official (Hungarian Chemists Association, Secretary of the Membrane Technology Department). In the case of regularly requested review articles and applications, members of committees and supervisors of more than 50 dissertations are attached to her name. She specializes in membrane technology and other technological processes, groundwater treatment.

Nándor Nemestóthy PhD, associate professor, he got his PhD in 2006, he has been dealing with membranes since 2008, mainly their application in energetics, like gas separation of fuel cells. The number of high impact publications is 98 (IF=254), with altogether 1890 citations (H=26). He has got 5 successful patent applications, he was the coordinator of numerous international and industrial research projects. His 5 PhD students got the doctoral degree so far.

Tamás Felföldi PhD, is a microbial ecologist, he works primarily in the field of microbial ecology, environmental genomics and molecular phylogeny. He has completed his PhD at ELTE. He has broad international connections which are supported by projects supervised by him (China, Romania). Currently he is the leader of the Microbial Ecology Research Group at the Institute of Aquatic Ecology of CER and as an assistant professor he is the leader of the Genomics Lab at ELTE.

Nóra Rodek PhD, assistant professor - has been an employee of the University of Pannonia since 2008. Her PhD research field include responsible and sustainable corporate governance, measuring and consciously applying CSR at the management level. From 2020 she has been the head of the Sustainability Department of the Ministry of Innovation and Technology. She represented Hungary in the Agenda 2030 Council Working Group as a member, she is the member of ESDN (European Sustainable Development Network) of governmental experts on sustainability, as well as the member of EIONET - Member of the European Environmental Agency (EEA) network of experts.

THE PROFESSIONAL TEAM

Ildikó Virág Neumann PhD, is associate Professor and the head of Department of International Economics (Institute of Economics) at Faculty of Economics Sciences of University of Pannonia. she is also the head of International Economics undergraduate course (BA) and International Economics MA course. She worked as a research fellow at iASK KRAFT Social Innovation Lab and also at MTA-PE (Hungarian Academy of Sciences –University of Pannonia) Networked Research Group on Regional Innovation and Development Studies. Her research fields are International Economics and International Trade and their statistical analysis and modelling like the gravity model.

Mihály Pósfai DSc, professor, member of the Hungarian Academy of Sciences, leader of the Environmental Mineralogy Research Group. Obtained his degree in geology and PhD in mineralogy at ELTE, Dept. of Mineralogy. Works at the University of Pannonia since 1994. Published about 100 peer-reviewed papers in the field of environmental mineralogy (including research on biominerals and atmospheric aerosol particles). His work was cited more than 8000 times and has an h-factor of 50.

Csaba Ferenc Vad PhD, is a community ecologist, working primarily in the field of plankton ecology. After receiving his PhD (ELTE, 2014), he held a Marie Skłodowska-Curie postdoc position at WasserCluster Lunz (Austria; 2015-2018), after which he worked as a postdoc at KU Leuven (Belgium; 2019) where he is currently a guest researcher. He is affiliated to CER since June 2019 and since April 2021, he is the leader of the Plankton Ecology Research Group of the Institute of Aquatic Ecology.

Viktor Sebestyén PhD, research fellow, University of Pannonia, Faculty of Engineering, Sustainability Solutions Research Lab. He is a researcher in the field of environmental modeling since 2016. His focus is the environmental protection and sustainable development, especially modeling the causal relationships of complex systems, with special regard to the development of data-driven decision support tools related to sustainable development goals and the identification of environmental impacts.

Ferenc András PhD, associate professor, Head of the Institute of Social Sciences of MFTK, former coordinator of SROP-4.2.2.A-11/1 / KONV-2012-0064 on behalf of MFTK, co-editor of the volume Climate Change, Society, Ethics.

Dénes Schmera DSc, is the leader of the Aquatic Invertebrates and Community Ecology Research Group. He also an editor for Limnologica and Community Ecology. His primary scientific interest is in how ecological communities are structured and what are the driving mechanisms behind, and what methods can be used for assessing them.

TARGET GROUP

- Decision makers
- Scientific community
- Research institutions, universities
- Schools, teachers
- General public

POSSIBLE PARTNERSHIPS

EU universities and research institutions for the joint submission of proposals for and implementation of HORIZON R&D and other (e.g. LIFE IP) projects in the fields of the National Laboratory.

PROFESSIONAL CONTACT

DR. ANDRÁS GELENCSÉR

Professor



gelencs@almos.uni-pannon.hu



+36 1 279 6171