

PERSONAL INFORMATION

Rastislav Skalský



Sex male | Date of birth 03/06/1976 | Nationality Slovak

WORK EXPERIENCE

2012 - present

Research Scholar

IIASA – International Institute for Applied Systems Analyses, Schlossplatz 1, Laxenburg, Austria, www.iasa.ac.at

- process-based modelling of agro-ecosystems at global and continental level with focus on crop production and biogeochemical cycling in plat-soil-atmosphere system;
- soil, topography, land cover, land use data analysis;
- bio-physical models up-scaling and uncertainty assessment;
- database and GIS data processing in different environments;
- model/data interface development, testing and maintenance;
- project management, conference and meetings attendance, publication of research results.

Business or sector Research

1999 - present

Research Scientist

NPPC-VUPOP – National Agricultural and Food Centre – Soil Science and Conservation Research Institute, Gagarinova 10, 827 13 Bratislava, Slovakia, www.vupop.sk

- policy-relevant interpretation of national-wide soil and landscape data for different purposes (LFA, CAP, EIONET, national needs);
- environmental modelling – soil and landscape data coupling and process based models up-scaling mostly focused on simulation of water regime of soil and soil organic carbon balance at local, regional and national scales;
- soil survey, soil classification, soil mapping at local and regional levels;
- maintenance of national soil information system datasets with focus on National Agricultural Soils Inventory data digitization and implementation;
- project management, conference and meetings attendance, publication and dissemination of research results.

Business or sector Research, Environmental protection

EDUCATION AND TRAINING

1999 – 2008

Philosophiae Doctor (PhD.)

Philosophie Doctor
PhD.

Comenius University, Faculty of Natural Science, Department of Soil Science, Bratislava, Slovakia

- Soil science and environment,
- soil and landscape survey,
- soil science knowledge & soil information GIS,
- digital soil mapping,
- process-based modelling of soil-plant-atmosphere interactions

1994 – 1999

Magister of Environmental Sciences (Mgr.)

Master of Science
(MSc.)

Comenius University, Faculty of Natural Science, Department of Soil Science, Bratislava, Slovakia

- soil genesis,
- soil – plant interactions,
- soil classification and soil & vegetation survey

PERSONAL SKILLS

Mother tongue(s) Slovak

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	C1	C1	C1
Czech	C2	C2	C1	C1	C1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills ▪ good communication skills;
▪ working in international and multi-cultural environment/teams.

Organisational / managerial skills ▪ small group coordination (current and former project team leaderships)

Job-related skills ▪ soil and landscape survey;
▪ soil description, classification and sampling;
▪ handling and processing huge datasets;
▪ GIS data and databases analysis of soil and landscape data.

Computer skills ▪ working with MS Access
▪ working with MS SQL Server
▪ working with ESRI ArcGIS
▪ SQL coding
▪ Visual Basic coding

Other skills ▪ organization of events (meetings, seminars, field trips)

ADDITIONAL INFORMATION

Projects **Most important actual and former research projects**

IIASA:

- 2017 – 2020: CIRCASA - the European Union's Horizon 2020 project Coordination of International Research Cooperation on soil CARbon Sequestration in Agriculture, IIASA research team member
- 2017 – 2021: RESTORE+ - International Climate Initiative (IKI) project on restoration or utilization of degraded/marginal land in Indonesia and Brazil, IIASA research team member
- 2016 – 2019: GROW Observatory - the European Union's Horizon 2020 research and innovation programme under grant agreement No 690199 on scaling-up the citizen driven environmental monitoring in the domain of land cover and land use change, IIASA research team member
- 2014 – 2020: IMBALANCE P – European Research Council (ERC) grant project focused on various aspects of global phosphorous balance, IIASA research team member
- 2012 – 2016: IMPACT2C – EU 7th FP research project focused on analysis of early impact of 2°C warming in Europe in different sectors, IIASA research team member

NPPC-VUPOP:

2020 – 2024: EJP Soil - the European Union's Horizon 2020 project to create an enabling environment to enhance the contribution of agricultural soils to key societal challenges, research team member

2019 – 2023: URANOS -EU operation program research and innovation project on data and knowledge support for decision-making systems and strategical planning of climate change adaptation and minimising soil degradation in agricultural landscape, principal researcher for partner organization

2018: Contract with Ministry of Agriculture and Rural Development on Crop Yield Forecast in Actual Agricultural Season with SK_CGMS modelling system, SSCRI principal researcher

2018 – 2019: Contract with Ministry of Agriculture and Rural Development on Evaluation of CAP Rural Development Program to Soil erosion and Soil Organic Carbon in Programming Period 2015 – 2020, SSCRI research team member

2016 – 2018: FACES – Erasmus+ project on creating the international digital platform and database for the soil classification information exchange critically needed for the teaching in environmental sciences, SSCRI research team member

2015 – 2019: ENVISOC: Slovak Research and Development Agency project on environmental evaluation of soil organic carbon regulation in different ecosystems, investigator

2012 – 2015: C-FORLAND –focused on soil organic carbon inventory in forestry and agricultural sectors and its balance in context of IPCC reporting, SSCRI principal researcher;

2012 – 2013: national key expert for the Less Favourable areas delimitation as a part of Common Agricultural Policy of EC implementation at national level (Soil information and GIS expert);

2012 – 2013: KPP-Info – Slovak Research and Development Agency project of bilateral Czech and Slovak collaboration in field of National Agricultural Soil Inventory data implementation into information system and its publication, national principal researcher;

2010 – 2012: eContentPlus project GS-Soil, work focused on national soil data harmonization across the EU, (INSPIRE directive best practice network), SSCRI research team member, Soil harmonization working package team leader within SSCRI;

2008 – 2011: 7. FP project CC-TAME (www.cctame.eu), work focused on building-up the EU level soil and landscape data infrastructure for bio-physical modelling and geographical data management, SSCRI team principal researcher and project's working package coordination;

2006 – 2009: 6. FP project GEO-BENE (www.geo-bene.eu), work focused on building-up the global level soil and landscape data infrastructure for bio-physical modelling and geographical data management, SSCRI team coordination;

2005 – 2006: MEUSIS-SK, contract with EC JRC for providing geographically and semantically harmonized national data on soil, SSCRI research team member;

2003 – 2006: 6. FP project INSEA, work focused on EU level soil and landscape data infrastructure for bio-physical modelling and geographical data management, SSCRI research team member;

Soil and landscape survey experiences (NPPC-VUPOP):

FACES (2016) Slovak field trip preparation, instructor

LUCAS (2015) land cover/land use survey, soil sampling, field surveyor;

LUCAS (2012) land cover/land use survey, soil sampling, field surveyor;

(2010, 2011) local-level soil inventory in the municipality Selice – soil description, soil sampling, soil map compilation, principal surveyor;

(2010, 2011) creation and testing of the soil survey manual for the 1:10.000 soil maps update, principal researcher;

LUCAS (2009) land cover/land use survey, soil sampling, field surveyor;

2007 – 2010 soil survey for the land reclamation projects (municipality level), field surveyor;

CMS-P (2007) soil profiles description and documentation, soil sampling for the national soil monitoring system, field surveyor;

LUCAS (2007) land cover/land use survey, topsoil properties description, field surveyor;

BIOSOIL (2006) soil profiles description and documentation, soil sampling for the international forest soil monitoring system, field surveyor;

(2005 – 2008) local-level soil inventory in the Gemerská Hôrka municipality surroundings – soil description, soil sampling, soil map compilation, PhD. thesis project;

(2003, 2004) soil profiles description and documentation, soil sampling for the regional soil and pedo-geochemical maps of Lučenec-Rimava and Záhorská nížina regions, field surveyor;

CMS-P (2002) soil profiles description and documentation, soil sampling for the national soil monitoring system, field surveyor;

1999 - 2003 soil survey for the land reclamation projects and Land Evaluation maps update (municipality level), field surveyor;

Publications

Most important publications:

- Folberth C , Khabarov N , Balkovic J , Skalsky R , Visconti P, Ciais P, Janssens I, Peñuelas J, et al. (2020). The global cropland sparing potential of high-yield farming. *Nature Sustainability* 3: 281-289. DOI:10.1038/s41893-020-0505-x.
- Flach R, Skalsky R , Folberth C , Balkovic J , Jantke K, & Schneider UA (2020). Water productivity and footprint of major Brazilian rainfed crops – A spatially explicit analysis of crop management scenarios. *Agricultural Water Management* 233: e105996. DOI:10.1016/j.agwat.2019.105996.
- Keith Paustian, Sarah Collier, Jeff Baldock, Rachel Burgess, Jeff Creque, Marcia DeLonge, Jennifer Dungait, Ben Ellert, Stefan Frank, Tom Goddard, Bram Govaerts, Mike Grundy, Mark Henning, R. César Izaurralde, Mikuláš Madaras, Brian McConkey, Elizabeth Porzig, Charles Rice, Ross Searle, Nathaniel Seavy, Rastislav Skalsky, William Mulhern & Molly Jahn (2019). Quantifying carbon for agricultural soil management: from the current status toward a global soil information system. *Carbon Management* 10 (6): 567-587. DOI:10.1080/17583004.2019.1633231.
- Folberth C , Baklanov A , Balkovic J , Skalsky R, Khabarov N , & Obersteiner M (2019). Spatio-temporal downscaling of gridded crop model yield estimates based on machine learning. *Agricultural and Forest Meteorology* 264: 1-15. DOI:10.1016/j.agrformet.2018.09.021.
- Zhang J, Balkovic J, Azevedo L, Skalsky R, Bouwman AF, Xu G, Wang J, Xu M, et al. (2018). Analyzing and modelling the effect of long-term fertilizer management on crop yield and soil organic carbon in China. *Science of the Total Environment* 627: 361-372. DOI:10.1016/j.scitotenv.2018.01.090.
- Balkovic J, Skalsky R, Folberth C, Khabarov N, Schmidt E, Madaras M, Obersteiner M, & van der Velde M (2018). Impacts and Uncertainties of +2°C of Climate Change and Soil Degradation on European Crop Calorie Supply. *Earth's Future* 6 (3): 373 -395. DOI:10.1002/2017EF000629.
- Zhang J, Balkovic J, Azevedo L, Skalsky R, Bouwman AF, Xu G, Wang J, Xu M, et al. (2018). Analyzing and modelling the effect of long-term fertilizer management on crop yield and soil organic carbon in China. *Science of the Total Environment* 627: 361-372. DOI:10.1016/j.scitotenv.2018.01.090.
- Folberth C, Skalsky R, Moltchanova E, Balkovic J, Azevedo L, Obersteiner M, & van der Velde M (2016). Uncertainty in soil data can outweigh climate impact signals in crop yield simulations. *Nature Communications* 7: art.no.11872. DOI:10.1038/ncomms11872.
- Tobiašová, E., Barančíková, G., Gomoryová, E., Makovníková, J., Skalský, R., Halas, J., Koco, Š., Tarasovičová, Z., Takáč, J., Špaňo, M. (2016) Labile forms of carbon and soil aggregates. *Soil and Water Research* 4 (11): 259 – 266. doi: 10.17221/182/2015-SWR
- Xiong W, Skalsky R, Porter CH, Balkovic J, Jones JW, & Yang D (2016). Calibration induced uncertainty of the EPIC model to estimate climate change impact on global maize yield. *Journal of Advances in Modeling Earth Systems* 8 (3): 1358-1375. DOI:10.1002/2016MS000625.
- Ma K, Liu J, Balkovič J, Skalsky R, Azevedo L, & Kraxner F (2016). Changes in soil organic carbon stocks of wetlands on China's Zoige plateau from 1980 to 2010. *Ecological Modelling* 327: 18-28. DOI:10.1016/j.ecolmodel.2016.01.009.
- Elshout P.M.F., Van Zelm R., Balkovic J., Obersteiner M., Schmid E., Skalsky R., Van Der Velde M., Huijbregts M.A.J. (2015) Greenhouse-gas payback times for crop-based biofuels *Nature Climate Change*, 5 (6) , pp. 604-610. ISSN 1758-678X
- van der Velde, M. Folberth, C. Balkovic, J. Ciais, P. Fritz, S. Janssens, I.A. Obersteiner, M. See, L. Skalsky, R. Xiong, W. Penuelas, J. (2014). African crop yield reductions due to increasingly unbalanced Nitrogen and Phosphorus consumption. *Global Change Biology*, 20(4):1278-1288
- Balkovič, J., van der Velde, M., Skalsky, R., Xiong, W., Folberth, Ch., Khabarov, N., Smirnov, A., Mueller, N.D., Obersteiner, M., 2014. Global wheat production potentials and management flexibility under the representative concentration pathways, *Global and Planetary Change*, 122: 107 - 121
- Xiong, W. Balkovic, J. van der Velde, M. Zhang, X. Izaurralde, R.C. Skalsky, R. Lin, E. Mueller, N. Obersteiner, M. (2014). A calibration procedure to improve global rice yield simulations with EPIC. *Ecological Modelling*, 273:128-139
- Xiong, W. van der Velde, M. Holman, I.P. Balkovic, J. Lin, E. Skalsky, R. Porter, C. Jones, J. Khabarov, N. Obersteiner, M., 2014. Can climate-smart agriculture reverse the recent slowing of rice yield growth in China? *Agriculture, Ecosystems & Environment*, 196:125-136
- Balkovic, J. van der Velde, M. Schmid, E. Skalsky, R. Khabarov, N. Obersteiner, M. Sturmer, B. Xiong, W. (2013). Pan-European crop modelling with EPIC: Implementation, up-scaling and regional crop yield validation. *Agricultural Systems*, 120:61-75
- Balkovic, J. Rampasekova, Z. Hutar, V. Sobočka, J. Skalsky, R. (2013). Digital soil mapping from conventional field soil observations. *Soil and Water Research*, 8(1):13-25
- Barančíková, G. Makovníková, J. Skalský, R. Tarasovičová, Z. Nováková, M. Halás, J. Koco, Š. Gutteková, M. (2013). Changes in organic carbon pool in agricultural soils and its different development in individual agro-climatic regions of Slovakia. *Agriculture (Poľnohospodárstvo)*, 59:9–20
- Barančíková, G. Makovníková, J. Skalský, R. Tarasovičová, Z. Nováková, M. Halás, J. Gutteková, M. Koco, Š. (2012) Simulation of Soil Organic Carbon Changes in Slovak Arable Land and their Environmental Aspects. *Soil and Water Research*, 7:45-51
- Havlik P, Schneider U.A, Schmid E, Bottcher H, Fritz S, Skalsky R, Aoki K, De Cara S, Kindermann G, Kraxner

F, Leduc S, McCallum I, Mosnier A, Sauer T, Obersteiner M., 2011. Global land-use implications of first and second generation biofuel targets. *Energy Policy*, 39(10):5690-5702

Balkovič, J. Schmid, E. Skalský, R. Nováková, M. (2011). Modelling Soil Organic Carbon Changes on Arable Land under Climate Change – A Case Study Analysis of the Kočín Farm in Slovakia. *Soil and Water Research*, 6:30–42

Membership

- *Societas pedologica slovacica*
- International Union of Soil Science
- National focal point (Slovakia) for International Network of Soil Information Institutes (INSII) established by Global Soil Partnership Pillar 4 action of Food and Agricultural Organization of UN