

## Ing. Pavel Šamonil, Ph.D.

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### Qualification

2004 – defence of Ph.D. Thesis: *Forest Site Classification of the Bohemian Karst in relation to the soil diversity*, Czech University of Life Sciences, Prague

### Professional Experience

Since 2007 – assistant professor, Department of Forest Botany, Dendrology and Geobiocenology, Faculty of Forestry and Wood Sciences, Mendel University in Brno, Czech Republic

Since 2007 – scientist, Department of Forest Ecology, The Silva Tarouca Research Institute, Pruhonice/Brno, Czech Republic

2005-2007 – assistant professor, Department of dendrology and tree breeding, Faculty of Forestry and Environment, Czech Agricultural University, Prague, Czech Republic

### Teaching

- Mendel University in Brno (since 2007), Czech University of Life Sciences, Prague (2001 – 2006), Masaryk University (2015), Individual lectures at Charles University in Prague (CR), University of South Bohemia in Ceske Budejovice (CR), Masaryk University (CR), University of Kentucky (USA), Michigan State University (USA), University of Wroclaw (PL), Jagiellonian University in Krakow (PL), University of Zurich (CH)
- Supervision of students' final theses at the Czech University of Life Sciences, Charles University in Prague, Mendel University in Brno, Masaryk University, and University of Zurich. Eight students successfully defended Bachelor's Thesis, eleven students defended Master's Thesis, five students defended Ph.D. Thesis.

### Committees

Member of the Czech Science Foundation, research board 526 and P504 (Soil science, Ecology, Microbiology, Hydrobiology, Agriculture, Forestry) in periods 2008–2010, 2016–2020. Assessment of scientific projects, selection of the referees, decision-making on the order of projects, supervision of the solution of supported projects

Member of the Internal Grant Agency, Faculty of Forestry and Wood Technology, Mendel University Brno, 2014–2020

Member of the Grant Agency, Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague in 2004–2006

Member of the Šumava National Park Council since 2015

Member of Editorial Board in scientific journals: *Opera Corcontica* (since 2015), *Silva Gabreta* (since 2013), *Annals of Forest Research* (WoS, since 2015), *Catena* (WoS, since 2022).

### Research interest

Trajectories of soil evolution – non-linearity in pedogenesis, polygenesis, deterministic chaos in soils, convergence vs. divergence, impact of changing vegetation in soil memory, soils in forest vs. grassland ecosystems, progressive vs. regressive evolution  
Spatial pedocomplexity and its sources in old-growth and managed temperate forests, role of human interventions in soils, quantification of pedocomplexity using graph theory, geostatistics

Biogeomorphology – role of individual trees in landscape formation, various biomechanical effects of trees in soils, soil mechanical disturbance, reset of pedogenetical clocks, creep, biogeomorphic successional model of ecosystem evolution

Plant-soil interactions – complex system of feedbacks between trees and soil, theory of ecosystem engineering and niche construction, biomechanical and biochemical effects of trees in soils

Carbon cycle in soils – quantification of carbon in temperate and tropical forests as well as in non-forest areas, decomposition of organic matter in soils, soil microbiome composition and its role in soil evolution and organic matter decay, quantification of plant root systems using allometry, forms of upper organic horizons in forest soils, humus forms, stable isotope and <sup>14</sup>C in soils

Dating of soil, denudation rate calculation – radiometry, dendrochronology and dendrogeomorphology, dating of soil disturbances

### Lifetime scientometrical data

Author of 79 papers in impacted journals, 26 of them as the first author and 27 as second author

No. of citations on Web of Science (IF papers only, including self-citations) = 1809

H-index = 26

Location of the personal research activities: Czech Republic, Romania, Ukraine, Belarus, Michigan (USA), Washington (USA), Kentucky (USA), Maryland (USA), Virginia (USA, Slovakia, Poland, Papua New Guinea, Sri Lanka

### Latest studies relevant to the project topic

- Anderson-Teixeira K.J., Herrmann V. et al. 2022. Joint effects of climate, tree size, and year on annual tree growth derived from tree-ring records of ten globally distributed forests. *Global Change Biology* 28: 245–266. DOI: 10.1111/gcb.15934. IF2021=13.211.
- Šamonil P., Daněk P., Lutz J.A. et al. 2022. Biogeomorphic role of tree death in temperate forests: disturbance and species specific processes from local to continental scale. *Ecosystems*. 10.1007/s10021-022-00755-8, IF2020=4.217
- Kašpar J., Šamonil P., Krůček M. et al. 2021. Hillslope processes affect vessel lumen area and tree dimensions. *Frontiers in Plant Science*. 12:778802. doi: 10.3389/fpls.2021.778802, IF2020=5.753.
- Zhong Y., Chu C., Myers J.A. et al. 2021. Arbuscular mycorrhizal trees influence the latitudinal beta-diversity gradient of tree communities in forests worldwide. *Nature Communications*. IF2020=14.919.
- Phillips J.D., Šamonil P., 2021. Biogeomorphological Domination of Forest Landscapes: An example from the Šumava Mountains, Czech Republic. *Geomorphology* 383, 107698. <https://doi.org/10.1016/j.geomorph.2021.107698>. IF2020=4.139.
- Kašpar J, Tumajer J, Šamonil P, Vašíčková I 2021. Species-specific climate-growth interactions determine tree species dynamics in mixed Central European mountain forests. *Environmental Research Letters*. DOI: 10.1088/1748-9326/abd8fb. IF2020=6.793
- Šamonil P., Egli M., Steinert T., Abiven S., Norton K., Abiven S., Daněk P., Hort L, Brandová D., Christl M., Tikhomirov D. 2020. Soil denudation rates in an old-growth mountain temperate forest driven by tree uprooting dynamics, Central Europe. *Land Degradation and Development* 31: 222-239. <https://doi.org/10.1002/ldr.3443>. IF2020=4.977.
- Šamonil P., Phillips J.D., Daněk P., Beneš V., Pawlik L. 2020. Soil, Regolith, and Weathered Rock: Theoretical concepts and evolution in old-growth temperate forests, Central Europe. *Geoderma* 368: 114261. <https://doi.org/10.1016/j.geoderma.2020.114261>. IF2020=6.114.
- Šamonil P., Daněk P., Baldrian P, Tláškal V., Tejnecký V., Drábek. O. 2020. Convergence, divergence or chaos? Consequences of tree trunk decay for pedogenesis and the soil microbiome in a temperate natural forest. *Geoderma*. 376. 114499. <https://doi.org/10.1016/j.geoderma.2020.114499>. IF2020=6.114.
- Šamonil P., Phillips J., Pawlik L. 2020. Indirect biogeomorphic and soil evolutionary effects of spruce bark beetle. *Global and Planetary Change* 195: 103317. IF2020=5.114.
- Pawlik L. Buma B., Šamonil P. et al. 2020. Impact of trees and forests on the Devonian landscape and weathering processes with implications to the global Earth's system properties - A critical review. *Earth-Science Reviews* 205, 103200. IF2020=12.413.

### Projects – last five years

#### Investigator

- Czech Science Foundation 16-15319S GACR – Ecosystem engineering and soil complexity in old-growth temperate forests, (2016–2018)
- Grant Service of the Forests of the Czech Republic, state enterprise – Comprehensive analysis of the biological value of natural forests in the Protected Landscape Area Sumava under administration of the Forests of the Czech Republic, and the proposal of multifunctional management, (2016–2018)
- Czech Science Foundation - The mystery of biogenic soil creep: the biogeomorphic role of trees in temperate and tropical forests and its ecological consequences, (2019–2022)
- Šumava National Park Administration – Role of strong disturbances in Boubínský Primeval Forest: Impact of Herwart Storm in forest stands formed by storms in 1870 and 2008 – phase I (2018–2020)
- Šumava National Park Administration – Role of strong disturbances in Boubínský Primeval Forest: Impact of Herwart Storm in forest stands formed by storms in 1870 and 2008 – phase II (2020–2021)
- Šumava National Park Administration – Role of strong disturbances in Boubínský Primeval Forest: Impact of Herwart Storm in forest stands formed by storms in 1870 and 2008 – phase III (2021–2022)

#### Co-investigator

- Czech Science Foundation 20-09895S - Biodiversity, disturbance history and soil memory: testing the Holocene continuity of species-rich forest-steppe ecosystems (2020–2022, PI: Jan Roleček)