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University of Agriculture in Krakow
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MAJOR ACADEMIC DISCIPLINE: Environmental Sciences

SPECIALIZATIONS Forestry, Restoration Ecology, Forest Land Reclamation

FIELD OF STUDIES Forest ecosystem restoration on post-industrial sites; plant and soil relationships, trees nutrition, tree growth and adaptation to redeveloped ecosystem conditions, biogeochemistry and nutrient cycling, carbon sequestration, forested wetlands restoration, site and mine soil classification, forest management on reclaimed mine sites; trace elements bioavailability; bio-stabilization and remediation of contaminated sites.

SCIENTIFIC ACHIEVEMENTS AND PROFESSIONAL APOINTMENTS:

2016: full professor in forestry (forest ecology and reclamation)

2013-2014: Fulbright scholar, visiting professor at Virginia Tech, Blacksburg, USA VA

2011 D.Sc.: University of Agriculture in Krakow, Faculty of Forestry (Major Forest Ecology and Forest Land Reclamation, minor Soil Science and Plant Ecology)

2005 Ph.D.: University of Agriculture in Krakow, Faculty of Forestry (Major reclamation of disturbed sites, minor Soil Science and Plant Ecology)

1999 M.S. and B.S: University of Agriculture in Krakow, Forest Faculty, Department of Forest Soil Science (Forestry and Soil Science)

2009 Post-doc: Virginia Polytechnic Institute and State University, Dept. Crop & Soil Environmental Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA, Advisor: W. Lee Daniels

2016 to present Dean of Faculty of Forestry

2016 to present full professor position at University of Agriculture in Krakow

2012 -2016 Associate Dean for Research and Development, Faculty of Forestry University of Agriculture in Krakow

2005 -2016 Associate Professor, Dept. Forest Ecology, Faculty of Forestry, University of Agriculture in Krakow

1999 to 2005 Assistant Professor Department of Forest Ecology Agricultural University of Agriculture in Krakow

Post-diploma Study 2008-2010 Krakow University of Technology, Center of Pedagogy and Psychology (teaching, personal development and education)

Post-diploma Study 2001 Post diploma Study of Environmental Protection and Nature Conservation, Agricultural University of Cracow, Forest Faculty

SCHOLARSHIPS:

Fulbright Advanced Senior Research Grant, Visiting Scholar, Virginia Polytechnic Institute and State University, Dept. Crop & Soil Environmental Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA, USA (2013 to 2014)

Stanford University, Personal & Professional Development, Accredited degree, Design Thinking, Innovation and Commercialization of Science (2011)

AWARDS:

European Award for Sustainable Land Use - CULTURA Prize 2015 Albert Toepfer Foundation <http://toepfer-stiftung.de>

Other awards:

Pro Scientia et Vita Foundation Award for Young and Active Scientist of the 2009 year, Foundation of the Members of Agriculture Forestry and Veterinary Science, Polish Academy of Science (2009)

The Excellent Associate Editor Award for 2014 - 2017, Journal of Forestry Research, Springer, August 3 2017, North East Forestry University in Harbin, China (2017)

Honorary Professor of Transilvania University of Brasov (2018)

Honorary Research Fellow in the International Center on Land Reclamation and Ecological Restoration for Mining Areas, China University of Mining and technology, Beijing (2017)

Rector of University of Agriculture in Krakow Award for Distinguished Scientific Achievements (publications) (2007, 2011, 2014, 2015, 2016, 2018, 2019)

Rector of University of Agriculture in Krakow Award for distinguished educational achievements (co-author of new study course Environmental Management) (2014)

Rector of University of Agriculture in Krakow Award for distinguished scientific achievements (Doctoral thesis) (2006)

Scholarship of Rector of University of Agriculture in Krakow for the scientist for employees who stand out in raising funds for research (3 months) (2019)

Scholarship of Rector of University of Agriculture in Krakow for the scientist for employees who stand out in raising funds for research (5 months) (2016)

Scholarship of Rector of University of Agriculture in Krakow for the most interesting research supporting for young scientist of Agriculture, Forestry and Veterinary Science in frame of Alina and Jan Wagowie Scholarship Foundation contest (2009)

Award in Scientific Contest Presentation "Mining Workshop 2006" for young scientist, for the presentation: The development of reclamation methods in filling sand mining – exemplified by sand cast. Organized by Mineral Resource and Energy Managing Institute of Polish Academy of Science and Mining Authority. Krakow-Tomaszowice, (2006)

MEMBERSHIP IN PROFESSIONAL SOCIETIES, EDITORIAL BOARD AND REVIEWER :

The American Society of Mining and Reclamation; Society of Ecological Restoration; The Polish Society of Soil Science

Editorial Board Member, Subject Editor of Journal of Forestry Research

Guest Editor in Forests, special issue Impact of Soil Conditions on Tree Growth

<https://www.mdpi.com>

Editorial Board Member, Section Editor: Journal of Plant Chemistry and Ecophysiology, Austin Publishing Group

Reviewer: Arid Land Research and Management, Botany, Canadian Journal of Forest Research, Chemosphere, Ecological Engineering, Ecological Research, Ecological Restoration, Environmental Pollution, Environmental Science & Policy, Environmental Science and Pollution Research, Forest Ecology and Management, International Journal of Phytoremediation, International Journal of Plant & Soil Science, Journal of the American Society of Mining and Reclamation, Journal of Environmental Quality, Journal of Environmental Management, Journal of Forestry Research, Journal of Hazardous Material, Pedosphere, PLOS One, Polish Journal of Environmental Studies, Remote Sensing, Science of The Total Environment

TEACHING/STUDENT ADVISING: Course Taught: Forest Ecology (undergraduate), Ecology (undergraduate), Forest Land Reclamation (undergraduate and graduate), Reclamation of Disturbed Lands (graduate), Environmental Protection (undergraduate), Ecological Engineering and Ecosystem Service, Ecology of Post-Mining and Postindustrial Sites (graduate in English and Erasmus Program), Remediation of Contaminated Sites (graduate), Remediation with Ecological Engineering (undergraduate), Carbon Biogeochemistry in Forest Ecosystem (graduate), Global Environmental Problems (graduate - in collaboration with Melanie Szulczewski PhD, Fulbright Scholar, University of Mary Washington, VA, USA)

Students Advised: Undergraduate (20) Graduate (21) Ph.D. Students (4)

FUNDED RESEARCH PROJECTS:

1. **M. Pietrzykowski** & collaborators (principal investigator, coordinator of Polish tasks). Smart Strategies for the transition in coal intensive regions, Horizon 2020 Call: H2020-LC-SC3-2018-2019-2020 (BUILDING A LOW-CARBON, CLIMATE RESILIENT FUTURE: SECURE, CLEAN AND EFFICIENT ENERGY) Topic: LC-SC3-CC-6-2018 Type of action: CSA, Proposal number: 836819, Proposal acronym: TRACER). 1990 000 Eur. 2019 – 2022.
2. P., Gruba (principal investigator), **M., Pietrzykowski**, J., Socha. (main investigators): Relationships between the soil trophic network and β -Glucosidase activity and their response to warming and drought: comparative studies of soils of different spruce stands in Poland and China. National Foundation of Science (Poland), SHENG 1. 2018/30/Q/NZ9/00378, PLN 529, 200. 00 . \$. 132, 300. 00. 2019-2022.
3. P., Gruba (principal investigator), **M. Pietrzykowski** (main investigator). Impact of heavy metal pollution on the stabilization and accumulation of organic matter in acidic forest soils against the background of a diverse geological base and species composition of stands, Grant Opus UMO-2017/25 / B / ST10 / 02128, National Foundation of Science (Poland). PLN 400, 000, \$100, 000. 2017 – 2020.
4. M., Chodak (principal investigator), **M., Pietrzykowski** (main investogator). Phosphorus forms in technosols as affected by dominating tree species and parent material properties Grant No. 2018/31/B/ST10/01626 National Foundation of Science (Poland). PLN 262 890,00 \$ 65, 723. 00. 2019 – 2021.

5. **M. Pietrzykowski** (principal investigator): The impact of alders (*Alnus* sp.) on biogeochemical transformation of technogenic soil-substrate. Grant No. 207737. National Foundation of Science (Poland). PLN 203, 022. 00. \$56395. 2016-2018.
6. **M. Pietrzykowski** (scientific supervisor for PhD student Bartłomiej Woś): Impact of various tree species on the biological and chemical transformations of soil substrates and ecological indicators of vascular plant communities arising during the ecosystem succession on reclaimed post-mining sites. Grant PRELUDIUM No. 2012/07/N/NZ8/01913, National Foundation of Science (Poland). PLN 69,000. \$23,000. 2013-2015.
7. **M. Pietrzykowski**. Fulbright Advanced Senior Grant: Ecological effectiveness assessment of reclamation methods - with or without topsoil. Fulbright Advanced research Grant, Virginia Polytechnic Institute and State University College of Agriculture and Life Science, Department of Crop & Soil Environmental Science. Polish-US Fulbright Commission. September 1, 2013 – February 28 2014.
8. W. Lee Daniels & collaborators., **M., Pietrzykowski** (investigator) Weanack/Shirley Wetland Experiment (WSWE), Shirley Plantation on the James River in Charles City County, VA – M. Pietrzykowski task: The growth and nutrient supply of young bald cypress (*Taxodium distichum* (L.) L.C. Rich.) in reconstructed freshwater forested wetlands in southeastern Virginia. Virginia Tech. September 1 2013 – February 28 2014
9. P. Tylek et al., and **M. Pietrzykowski** (main investigator). Development of new technologies and functional model for machine to the rehabilitation of fields after the energetic willow plantation. University of Agriculture in Krakow, Industrial Institute of Agriculture Engineering, Poznan, PW PROMAR Enterprise, Poznan. The National Center for Research and Development. Grant UE 6404 (NCBiR, PBS2, 2014-2016) No. 207737. PLN 1, 737, 203 (\$542,000). 2013 – 2016.
7. W. Lee Daniels & collaborators, N. House and **M. Pietrzykowski**. Soil genesis of saline dredged material, Shirley Plantation and Virginia Tech. 2008-2009.
6. **M. Pietrzykowski** (Principal investigator). An analysis and optimization of site classification methods and criteria for the evaluation of reclaim to forest on selected post mining areas in Poland. The Polish Ministry of Science and Higher Education. Grant No. N 30901332/2076. March 2007- March 2009. PLN125,000 (\$42,000).
7. M. Niklińska, M. Chodak, E. Śliwińska, **M. Pietrzykowski** (Investigator). The structure, biodiversity and activity of microorganisms on reclaimed grounds as an indicator of biological reclamation success. The Polish Ministry of Science and Higher Education. Grant No. P04G 02230. Institute of Environmental Sciences, Jagiellonian University, Krakow, Department of Open Cast Mining, AGH University of Science and Technology Krakow. PLN131,450 (\$411,000). February 2006 – July 2008.
8. **M. Pietrzykowski**. Determination of phyto-pedological index of biogene accumulation for forest land reclamation assessment – exemplified by external slope bank after lignite mining. Scholarship and research grant of Rector of University of Agriculture in Krakow. PLN5000 (\$2000). January 2007 – May 2007.
9. W. Krzaklewski, K. Bajorek-Zydroń, **M. Pietrzykowski** (Investigator). An assessment of Scots pine (*Pinus Sylvestris* L.) nutrient supply in the first class age growing on plateau of external slope Bełchatow Lignite Open Cast Mining and forests of Bełchatow Forest District. The Polish Minister of Scientific Research and Information Technology, Grant No 2P06L07229. PLN75,000 (\$23437). February 2005 – February 2007.
10. **M. Pietrzykowski**, W. Krzaklewski. Characteristics of soils and vegetation in reclaimed areas or in areas left for succession in the Szczakowa open cast sand mine in southern

- Poland. The Polish Minister of Scientific Research and Information Technology. Grant No. P06 S 03925. PLN29,000 (\$9700). July 2003 – July 2005.
11. S. Małek, J. Barszcz, W. Krzaklewski, **M. Pietrzykowski**, M. Pająk. Improvement of site revitalisation and rebuilding of mountain forest stands in Regional Directory of State Forests RDLP in Katowice taking into consideration of improvement of water relations and forest genetic selection. National Found for Environmental Protection and Water Management NFOŚIGW in Warsaw. Project No. 566/2003/Wn50/NE-PR-TX/D. Department of Forest Ecology, University of Agriculture in Krakow. PLN 500,000 (\$157,000). 2003-2005.
 12. W. Krzaklewski, J. Fijał. **M. Pietrzykowski**. Program of dusting reduction and turf planting introduction guidelines for post-flotation pounds of the Boleslaw Mining-Metallurgy Plant in Bukowno. Financed by Boleslaw Mining-Metallurgy Plant in Bukowno, Poland. University of Agriculture in Krakow, AGH-University of Science and Technology Krakow. PLN120,000 (\$40,000). January 2000 – July 2001.

REFEREED JOURNAL ARTICLES (selected):

- Świątek, B., Woś, B., Gruba, P., **Pietrzykowski, M.** 2019. Bioaccumulation of heavy metals (Pb, Cd, Cr, Cu) in fine roots under three species of alders (*Alnus* sp.) plantation at different soil substrates addition on the reclaimed combustion wastes landfill. *Water Air Soil Pollut* (2019) 230:297 <https://doi.org/10.1007>
- Gruba, P., Socha, J., **Pietrzykowski M.**, Pasichnyk, D., 2019. Tree species affects the concentration of total mercury (Hg) in forest soils: Evidence from a forest soil inventory in Poland. *Science of The Total Environment*, 647: 141-148 <https://doi.org/10.1016/>
- Pietrzykowski M.** Antonkiewicz J. Gruba P. Pajak. M. 2018. Content of Zn, Cd and Pb in purple moor-grass in soils heavily contaminated with heavy metals around a zinc and lead ore tailing landfill. *Open Chemistry*, 16:1143-1152. (14 pkt. IF 1.425)
- Likus-Cieślik, J., Smoliński, A., **Pietrzykowski, M.**, Bąk A. 2019. Sulphur contamination impact on seasonal and surface water chemistry on a reforested area of a former sulphur mine. *Land Degradation and Development*. 30, 212-225. <https://doi.org/10.1002>
- Świątek, B., **Pietrzykowski, M.**, Józefowska, A., Woś, B., Maiti, S., K., Chodak, M. 2019. Fine root biomass and the associated C and nutrient pool under the alder (*Alnus* spp.) plantings on reclaimed technosols. *Geoderma*, 337 1021-1037
- Szostak, M., Knapik, K., Wężyk, P., Likus-Cieślik, J., **Pietrzykowski, M.** 2019 Fusing Sentinel-2 Imagery and ALS Point Clouds for Defining LULC Changes on Reclaimed Areas by Afforestation. *Sustainability*, 11(5), 1251; <https://doi.org/10.3390>
- Świątek, B., Chodak, M., **Pietrzykowski, M.** 2019. Estimation of fine root biomass of alders growing on technosols using two different methods. *Communications in Soil Science and Plant Analysis*, 50 (4), 474–481
- Woś B., **Pietrzykowski M.** 2019. Impact of tree species on macroelements content and properties of the initial soils in the conditions of reclaimed sand pit. *Sylwan* 163 (95): 407-414.
- Chodak, M., Sroka, K., Woś, B., **Pietrzykowski, M.** 2019. Effect of green alder (*Alnus viridis*) and black alder (*Alnus glutinosa*) on chemical and microbial properties of sandy mine soils. *Geoderma*, 356 (15), 113924. <https://doi.org/10.>

- Pietrzykowski M.** 2019. Tree species selection and reaction to mine soil reconstructed at reforested post-mine sites: Central and eastern European experiences. *Ecological Engineering*: X, 3 (2019) 100012: 3 – 10. <https://doi.org/10.1016>
- Szostak M., Knapik K., Likus-Cieślak J., **Pietrzykowski M.** 2019. Monitorowanie zasięgu roślinności o charakterze leśnym w obszarach rekultywowanych z zastosowaniem obrazowań satelitarnych Sentinel-2. *Sylvan*, 163 (1), 55- 61
- Józefowska, A., Sokołowska, J., Woźnica, K., Woś, B., **Pietrzykowski M.** 2019. Tree species and soil substrate affect buffer capacity of anthroposols in afforested post-mine sites in Poland. *Journal of Soil and Water Conservation*, 74 (4): 372-379
- Nawrot-Chorabik, K., **Pietrzykowski, M.** 2019. Ecophysiological aspects of biotechnological studies on in vitro tissue cultures for determination of trees reaction to environmental stress and intensification of protective potential of forest ecosystem. *Jurnal of Forestry Research*. 30(4):1159–1166.
- Józefowska, A., Woś, B., **Pietrzykowski, M.**, Schlaghamerský, J. 2019. Colonisation by enchytraeids as a suitable indicator of successful biological reclamation of post-mining technosols using alders. *Applied Soil Ecology*, Applied Soil Ecology, Volume 145, January 2020
- Pająk, M., Michalec, K., Wąsik, R., Urban, O., Vitek, P., Woś, B., Krzaklewski, W., **Pietrzykowski, M.**, 2019. Quality of poplar wood introduced as part of forest remediation to a rock heap accompanying lignite mining). *Sylvan* 163 (10): 855–861.
- Ahirwal, J., Kumar, A., **Pietrzykowski M.**, Maiti, S. K. 2018. Reclamation of coal mine spoil and its effect on Technosol quality and carbon sequestration: a case study from India. *Environmental Science and Pollution Research*.25:27992–28003, <https://doi.org/10.1007>
- Woś, B., **Pietrzykowski, M.**, Józefowska, A. 2018. Reclaimed mine soil substrates and tree stands vs. successional forest floor vegetation: A case study of developing ecosystems on afforested mine sites. *Ecological Engineering* 120: 504-512. <https://doi.org/10.1016>.
- Čížková, B., Woś, B., **Pietrzykowski, M.**, Frouz, J. 2018. Development of soil chemical and microbial properties in reclaimed and unreclaimed grasslands in heaps after opencast lignite mining. *Ecological Engineering* 123: 103-111. <https://doi.org/10.1016>.
- Pietrzykowski, M.**; Likus-Cieślak, J. 2018. Comprehensive Study of Soil-Plant and Surface Water Chemistry Relationships in Highly S Contaminated Environment on Reforested Former Sulfur Borehole Mine Sites. *Sustainability*, 10(7), 2442; <https://doi.org/10.3390/su10072442>
- Pająk M., Błońska E., Szostak M., Gašiorek M., **Pietrzykowski M.**, Urban O., Derbis P. 2018. Restoration of vegetation in relation to soil properties of spoil heap heavily contaminated with heavy metals. *Water Air Soil Pollution Water Air Soil Pollut* (2018) 229: 392
- Sroka K, Chodak M, Klimek B, **Pietrzykowski M.** 2018. Effect of black alder (*Alnus glutinosa*) admixture to Scots pine (*Pinus sylvestris*) plantations on chemical and microbial properties of sandy mine soils. *Applied Soil Ecology*, 124, 62-68.
- Likus-Cieślak J., **Pietrzykowski M.**, Chodak M. 2018. Chemistry of Sulfur-Contaminated Soil Substrate from a Former Frasch Extraction Method Sulfur Mine Leachate with Various Forms of Litter in a Controlled Experiment, *Water, Air, & Soil Pollution*
- Pietrzykowski M.**, Woś, B., Pająk, M., Wanic, T., Krzaklewski, W., and Chodak M. 2018. Reclamation of a lignite combustion waste disposal site with alders (*Alnus* sp.): assessment of tree growth and nutrient status within 10 years of the experiment. *Environmental Science and Pollution Research*, 25(17), 17091-17099.

- Pietrzykowski M.**, Woś, B., Pająk M., Wanic, T., Krzaklewski W., Chodak, M. 2018. The impact of alders (*Alnus* spp.) on the physico-chemical properties of technosols on a lignite combustion waste disposal site. *Ecological Engineering*, 120: 180–186.
- Pietrzykowski, M.**, Woś, B., Chodak M., Sroka, K., Pająk, M., Wanic, T. 2018. Effects of alders (*Alnus* sp.) used for reclamation of lignite combustion wastes. *Journal of American Society of Mining and Reclamation*. Published by ASMR; 1305 Weathervane Dr., Champaign, IL61821
- Józefowska, A., **Pietrzykowski, M.**, Woś, B., Cajthaml, T., Frouz, J. 2017. The effects of tree species and substrate on carbon sequestration and chemical and biological properties in reforested post-mining soils, *Geoderma* 292, 9-16, doi.org/10.1016
- Tylek, P., **Pietrzykowski, M.**, Walczyk, J., Juliszewski, T., Kwaśniewski, D., 2017. Root biomass and morphological characterization of energy willow stumps. *Croat. J. For. Eng.* 38(1): 47-54.
- Pietrzykowski M.**, Gruba P., Sproul G., 2017. The effectiveness of Yellow lupine (*Lupinus luteus* L.) green manure cropping in sand mine cast reclamation. *Ecological Engineering*, 2: 72–79. doi.org/10.1016
- Farhadi M., Tigabu M., **Pietrzykowski M.**, Danusevičius D., Odén P.Ch. 2017: Application of near infrared spectroscopy for authentication of *Picea abies* seed provenance, *New Forests* 48 (5): 629-642.
- Józefowska, A., **Pietrzykowski, M.**, Woś, B., Cajthaml, T., Frouz, J. 2017. Relationships between respiration, chemical and microbial properties of afforested mine soils with different soil texture and tree species: Does the time of incubation matter. *European Journal of Soil Biology*, 80: 102-209, doi.org/10.1016
- Likus-Cieślik, J., **Pietrzykowski, M.**, Szostak, M., Szulczewski, M. 2017. Spatial distribution and concentration of sulfur in relation to vegetation cover and soil properties on a reclaimed sulfur mine site (Southern Poland), *Environmental Monitoring and Assessment* 189: 87, <https://doi.org/10.1007>
- Likus-Cieślik J., **Pietrzykowski M.** 2017. Vegetation development and nutrients supply of trees in habitats with high sulfur concentration in reclaimed former sulfur mines Jeziórko (Southern Poland), *Environmental Science and Pollution Research*, 24(25) 20556–20566.
- Józefowska A., Woś B., **Pietrzykowski M.** 2016. Tree species and soil substrate effects on soil biota during early soil forming stages at afforested mine sites. *Applied Soil Ecology* 102: 70–79.
- Likus-Cieślik J., **Pietrzykowski M.**, Śliwińska-Siuśta M., Krzaklewski W., Szostak M. 2015. A preliminary assessment of soil sulphur contamination and vegetations in the vicinity of former boreholes on the afforested post-mine site Jeziórko. *Geology, Geophysics and Environment*. 41 (4): 371–380
- Woś B., **Pietrzykowski M.** 2015. Simulation of birch and pine litter influence on early stage of reclaimed soil formation process under controlled conditions. *Journal of Environmental Quality*, 44: 4: 1091-1098
- Pietrzykowski M.**, Daniels W. L., Koropchak S. C. 2015. Microtopographic effects of growth of young bald cypress (*Taxodium distichum* L.) in created freshwater forested wetland in southeastern Virginia. *Ecological Engineering* 83: 135 - 143
- Chodak M., **Pietrzykowski M.**, Sroka K. 2015. Physiological profiles of microbial communities in mine soils afforested with different tree species. *Ecological Engineering* 81: 462 - 470.

- Pietrzykowski M.**, Krzaklewski W., Woś B. 2015. Preliminary assessment of growth and survival of green alder (*Alnus viridis*), a potential biological stabilizer on fly ash disposal sites. *Journal of Forestry Research*. 26(1) 2015: 131-136.
- Pietrzykowski M.**, Socha J. and N. S. van Doorn. 2015. Scots pine (*Pinus sylvestris* L.) site index in relation to physico-chemical and biological properties in reclaimed mine soils. *New Forests*. 46:247–266.
- Pietrzykowski M.**, Krzaklewski W., Likus J., Woś B. 2015. Assessment of English oak (*Quercus robur* L.) growth in varied soil-substrate conditions of reclaimed Piaseczno sulfur mine dump. *Folia Forestalia Polonica, Series A*, 57 (1), 28-32.)
- Szostak M., Wężyk P., Hawryło P., **Pietrzykowski M.** 2015. The analysis of spatial and temporal changes of land cover and land use in the reclaimed areas with application of airborne orthophotomaps and LANDSAT images. *Geodesy and Cartography*, 64(1): 75-86
- Juliszewski T., Kwaśniewski D., **Pietrzykowski M.**, Tylek P., Walczyk J., Woś B., Likus J., 2015. Root biomass distribution in an energy willow plantation. *Agricultural Engineering*, 4(156), 43-49
- Woś B., **Pietrzykowski M.**, Krzaklewski W., 2014. Humus properties of soils formed under conditions of afforested dump ground of sulfur mine. *Sylvan*. 158 (12):893-900.
- Pietrzykowski, M.** Daniels, W. Lee. 2014. Estimation of carbon sequestration by pine (*Pinus sylvestris* L.) ecosystems developed on reforested post-mining sites in Poland on differing mine soil substrates. *Ecological Engineering* 73: 209–218
- Pietrzykowski, M.**, Socha, J., van Doorn, N.S., 2014. Linking heavy metal bioavailability (Cd, Cu, Zn and Pb) in Scots pine needles to soil properties in reclaimed mine areas. *Sci. Total Environ*. 470–471, 501–510.
- Pietrzykowski M.**, Chodak M. 2014. Near infrared spectroscopy - a tool for chemical properties and organic matter assessment of afforested mine soils. *Ecological Engineering*. 62: 115–122.
- Pietrzykowski M.** 2014. Soil quality index as a tool for Scots pine (*Pinus sylvestris*) monoculture conversion planning on afforested, reclaimed mine land. *Journal of Forestry Research*. 25(1): 63-74.
- Pietrzykowski, M.**, Woś, B., Haus, N. 2013. Scots pine needles macro-nutrient (N, P, K, Ca, Mg and S) supply at different reclaimed mine soil substrates - as an indicator of the stability of developed forest ecosystems. *Environmental Monitoring and Assessment*, 185:7445–7457
- Krzaklewski W., **Pietrzykowski M.**, Woś B. 2012. Survival and growth of alders (*Alnus glutinosa* (L.) Gaertn. and *Alnus incana* (L.) Moench) on fly ash technosols at different substrate improvement. *Ecological Engineering* 49, 35-40.
- Pietrzykowski M.**, Pająk M., Krzaklewski W. 2011. Assessment of soil-site conditions on the spoil heaps of Lignite Mining Plant (KWB) Bełchatów reclaimed to forest with the use of the Site Soil Index (SIG). *Polish Journal of Soil Science*, 54(1), 81-88.
- Pietrzykowski M.**, Socha J. 2011. An estimation of Scots pine (*Pinus sylvestris* L.) ecosystem productivity on reclaimed post-mining sites in Poland (Central Europe) with using of allometric equations. *Ecological Engineering*, 37, 381-386.
- Pietrzykowski, M.**, Krzaklewski, W., Pająk, M., Socha, S., Ochał, W., 2010. Analysis and optimization of site classification and criteria of forest reclamation assessment in selected mining areas in Poland. University of Agriculture in Krakow Publishing House, Krakow.

- Pietrzykowski M.**, Socha J., Woś B. 2010. Biomass and deformation of the Scots pine (*Pinus sylvestris* L.) root systems in reclaimed open-cast mining pit and dumping ground. *Sylwan* 154 (2), 107-116.
- Ochał W., Pająk M., **Pietrzykowski M.** 2010. Diameter structure of selected pine stands growing on post-mining sites reclaimed for forestry. *Sylwan* 154(5): 323-332.
- Pietrzykowski M.** 2010. Fractional composition and optical properties of humus of soils developing on post-mining areas reclaimed for forest use. *Sylwan* 154(11), 742-749.
- Pietrzykowski M.**, Krzaklewski W. 2010. Heavy metals content in initial soil formed under succession communities on sand mine quarry. *EJPAU*. 13(4), 18. Available Online: <http://www.ejpau.media.pl>
- Chodak M., **Pietrzykowski M.**, Niklińska M. 2009. Development of microbial properties in a chronosequence of sandy mine soils. *Applied Soil Ecology* 41: 259 – 268.
- Pietrzykowski M.** and Krzaklewski W., 2007. Soil organic matter, C and N accumulation during natural succession and reclamation in an opencast sand quarry (southern Poland). *Archives of Agronomy and Soil Science*, 53 (5): 473 - 483
- Pietrzykowski M.** and Krzaklewski W., 2007. An assessment of energy efficiency in reclamation to forest. *Ecol. Eng.* 30: 341-348.
- Krzaklewski W., **Pietrzykowski M.** 2007. Site classification in post-mining areas reclaimed for forest use with special focus on phytosociological-soil method. *Sylwan* 151 (1), 51-57.
- Krzaklewski, W., Barszcz, J., Małek, S., Kozioł, K., **Pietrzykowski, M.**, 2004. Contamination of Forest Soils in the Vicinity of the Sedimentation Pond after Zinc and Lead Ore Flotation (in the Region of Olkusz, Southern Poland). *Water, Air, and Soil Pollut.* 159, 151–164.
- Krzaklewski W., **Pietrzykowski M.** 2002. Selected physico-chemical properties of zinc and lead ore tailings and their biological stabilization. *Water Air, and Soil Pollution*, 141 (1-4), s. 125-142.

BOOKS:

- Prasad MNV., & **Pietrzykowski, M.** (Ed.) 2020. *Climate Change and Soil Interactions*, 1st Edition, ISBN: 9780128180327, Elsevier, Page Count: 1001, <https://www.elsevier.com>
- Pietrzykowski, M.**, Krzaklewski W., Pająk, M., Socha, J., Ochał, W. 2010. An analysis and optimization of site classification methods and criteria for the evaluation of forest land reclamation on selected post mining areas in Poland. p. 145-164, in: M. Pietrzykowski (ed.) *Agricultural University in Krakow Press, Krakow, Poland.*
- Pietrzykowski M.**, Krzaklewski W. 2009. *Reclamation to forest in sand-filing mining exemplified on Szczakowa Mining. Monographs. Department of Forest Ecology, University of Agriculture in Krakow, Monos, Krakow. (In Polish, English summary), pp. 134.*

BOOKS CHAPTERS (selected):

- Courtney, R., **Pietrzykowski, M.** 2018. Soil quality indices for evaluation of acid mine spoil. Chapter 2 (in:) *Bio-Geotechnologies for mine site rehabilitation*, Eds: Majeti NV Prasad, Paulo Favas, and Subodh K Maiti. Elsevier, Amsterdam-Oxford-Cambridge, p. 33 - 48. ISBN 978-0-12-812986-9(5 pkt.)
- Pietrzykowski M.**, Krzaklewski W. 2018. Reclamation of mine lands in Poland. Chapter 27 (in:) *Bio-Geotechnologies for mine site rehabilitation*, Eds: Majeti NV Prasad, Paulo Favas, and Subodh K Maiti. Elsevier, Amsterdam-Oxford-Cambridge, p. 493-513. ISBN 978-0-12-812986-9(5 pkt.)

- Pietrzykowski M.**, Woś B., Pająk M., Wanic T., Krzaklewski W., Chodak M. 2017. Alders (*Alnus* sp.) as a potential biological stabilizer on fly ash disposal sites. Land Reclamation in Ecological Fragile Areas. Zhenqi, H. (Ed.). (2017). Land Reclamation in Ecological Fragile Areas. London: CRC Press. pages 465–471 Print ISBN: 978-1-138-05103-4, eBook ISBN: 978-1-351-68042-4
- Pietrzykowski M.** 2015. Reclamation and reconstruction of terrestrial ecosystems on mine sites - ecological effectiveness assessment. (Chapter 5), in: J.N. Govil et al. (ed.), Series: Energy Science and Technology, Coal Energy (Volume 2), Studium Press LLC, New Delhi, Houston, USA, p. 121-151
- Pietrzykowski M.**, Krzaklewski W. 2005. Heavy metals content in upper initial soil layer in filling sand works. In B Gworek ed. Element Cycling in The Environment: Bioaccumulation-Toxicity-Counteraction. European Integration. Monograph, VOL III. Gabriel Borowski Scientific Publisher, Lublin-Warszawa, chapter 2.1.21., p. 113-119.
- Pietrzykowski M.**, Pająk M. 2009. The Application of the Forest Soil Trophism Index (FSTI) for assessment of site condition variability in post-mining areas reclaimed to forestry. (In:) Bolesław Bieniek (ed.): Soil of chosen Landscapes. Contemporary problems of management and environmental protection. Monograph (Chapter IX), University of Warmia and Mazury in Olsztyn, Faculty of Environmental Management and Agriculture, Olsztyn, 153 – 163 (ss. 163).

CONFERENCE PAPERS (selected):

- Krzaklewski W, **Pietrzykowski M.** 2002. Preliminary results in research on the New technico-biological method for stabilization of post-mining non-ferrous metals ore waste settling tanks, Mining Workshop 2002, Engineering problems related with environmental protection in mining. May 27-29, 2002. Ustroń Śl.-Kraków. IGSMiE PAN Press. Conference Proceedings pp. 71-85.
- Krzaklewski W, **Pietrzykowski M.** 2003. A technical-biological Method for Stabilization of Post-flotation, Non-ferrous metals ore. Six international Symposium & Exhibition on Environmental Contamination in Central and Eastern Europe and the Commonwealth of Independent States, 1 – 4 September 2003, Prague, Czech Republic, Conference Proceedings pp. 149.
- Krzaklewski W, **Pietrzykowski M.**, Frukacz T. 2005. Electrical conductivity and pH characteristics of furnace waste from the Bełchatów power-plant on the Lubień waste storage area. Mining Workshop 2005, Engineering problems related with environmental protection in mining. June 20-22, 2005. Kazimierz Dolny n.Wisłą. IGSMiE PAN Press. Conference Proceedings pp. 145-156.
- Pietrzykowski M.**, Krzaklewski W. 2006. Organic carbon and nitrogen accumulation and some humus properties of initial soils on reclaimed and abandoned for plant succession areas of Sand Mine works 'Szczakowa' (Southern Poland), International Conference on The Role of Long-term Field Experiments in Agricultural and Ecological Sciences & Practical Solutions for Managing Optimum C and N Content in Agricultural Soils III, Prague 22nd-24th June 2005, Czech University of Agriculture, Prague, Proceedings: 165-177.
- Pietrzykowski, M.** 2007. Succession or reclamation - a case study of forest ecosystem development on a sand mine cast (in Southern Poland). Proceedings of MACE "Modern Agriculture in Central and Eastern Europe" - Green Week Scientific Conference 2007, "Managing Economic, Social and Biological Transformations", January, 17th and 18th, 2007, Berlin, Germany.

- Pietrzykowski M** and Krzaklewski W. 2007. Succession and reclamation - a case study of sand-mine excavation. *Acta Biochemica Polonica* Vol. 54 Supplement 1 (Abstracts): 90 - 91.
- Pietrzykowski M.** 2008. Macronutrient accumulation and relationships in a Scots pine (*Pinus sylvestris* L.) ecosystem on reclaimed opencast lignite mine spoil heaps in central Poland. *Proceedings of 25th Annual Meeting of American Society of Mining and Reclamation (ASMR) and International Affiliation of Land Reclamationists (IALR), "New Opportunities to Apply Our Science"*, Richmond, Virginia, USA, – June 14 to 19, 2008. p. 856 – 877.

CERTIFICATED COURSES:

2013. October 18 -19, Advanced Wetland Soils and Mitigation (Course Number: CSES 5854) by dr W. Lee Daniels and dr John M. Galbraith, Virginia Tech, Department of Crop and Soil Environmental Science, Virginia Polytechnic Institute and State University, VA, USA.
2010. Certificated scientific workshop: Application of microplates technique in environmental studies. "Institute of Environmental Sciences, Jagiellonian University, in frame: Factors of Population Extinction Risk, FRISC, Norway Grants, EOG. Krakow, 25-26/3, 2010.
2007. Modern Agriculture in Central and Eastern Europe - Managing Economic, Social and Biological Transformations, Berlin, Germany, Coordinated by Humboldt University in Berlin, supported by EU MACE Program, Marie Curie Actions, The Committee of Food, Agricultural and Consumer Protection of the Germany Federal Parliament. 17 – 18/1, 2007.
2006. Sustainable Forestry - change of forest management: from man-made towards natural forests. Training course organized by Chair of Soil Protection and Recultivation at the, Brandenburg Technical University in Cottbus, Germany, financed by EU Marie Curie Project "Modern Agriculture in central and Eastern Europe (MACE)" (11/20-11/23/2006).
2004. Practical course of FT-IR w Central Laboratory of Brandenburg Technical University in Cottbus (9/9-9/16/2004).

SCIENTIFIC EXPEDITIONS:

2015. Siberia - Magadan-Ochock See (1 month), Scientific Students expedition supervising, Lectures on Jakuck Federal University - Summer School in Geobothanic Station
2014. Azerbejgan, Kaukazus Mountains (1 month), Scientific Students expedition supervising
2013. Gorgia, Kaukazus Mountains, Kazbeg 5003 m. a.s.l., (1 month) Scientific Students expedition supervising
2012. Siberia (1 month) scientific expedition University of Agriculture in Krakow (main manager, scientific supervisor of students movements) - Baikal See, Chamar Daban and East Sajon Mountains
2011. California Trip - Death Valey, Great Canion, Yosemite National Park, Pinakle National Monument, John Muir National Forests.
2011. Romania Carpathian Mountains, Mounti Rodney, (1 month), Scientific students expedition supervising
2010. Italy, Alps Mountain, Prigelato, Scientific students expedition supervising, interdisciplinary scientific camp in Piemonte Alps, sponsored by Anna Pasek Foundation and ACU in Krakow, 8/27-9/4/2010.
2009. Yellow Stone, Great Plains, Wyoming Coal District, Big Horn Mountains, Bad Lands, Great Lakes, – geology, soils and vegetation: across the North America, from Atlantic Ocean to Wyoming, Sponsored by Virginia Tech, Advisor W. Lee Daniels.
2007. Czarnohora Carpatian Mountains, Ukraine (3 weeks) - scientific expedition University of Agriculture in Krakow (main manager, scientific supervisor of students movements)

OTHER FELLOWSHIP, PROFESSIONAL TRAINING AND PROFESSIONAL WORKSHOP PARTICIPATION:

2010. Norway, Trondheim, lectures in frame of Erasmus (co-organization of scientific exchange with Norwegian University of Science & Technology 2010/11 academic year, sponsored by Erasmus 4/24-4/28/2010).
2008. Czech Republic, Czeskie Budejovice, invited expert, Scientific meeting in Institute of Soil Biology, Biology Centre of the Academy of Sciences of the Czech Republic. lecture and presentation: "Succession and reclamation: from post-mining landscape towards forest ecosystem, (Case study of sand mining)", financed by Agricultural University of Krakow and Institute of Soil Biology Centre of the Academy of Sciences of the Czech Republic, 4/22-4/24/2008.
2008. Austria, Vienna, invited expert and lecturer - presentation: "Succession and reclamation: from post-mining landscape towards forest ecosystem", (Case study of sand mining). Workshop: "The Generation, Prevention and Treatment of Acid Mine Drainage and Old and Abandoned Mining Waste Sites – Environmental Risks and Remediation Techniques", organized by The SAFEMANMIN project, BIUTEC Environmental Experts in Vienna on the 17th-18th of January 2008 (supporting the implementation the Directive 2006/21/EC of the European Parliament and the Council on the management of waste from the extractive industries), financed by European Commission under the FP6 Program.
2006. Training course organized by NFZ.forestnet (Nancy France, Freiburg Germany, WSL Switzerland), sponsored by European Union; MountEcoSS - Mountain Ecology and Alpine Ecosystem Management, Summer School, Switzerland, Weissfluhjoch, Davos (2663 m a.s.l.), September 10-16/9, 2006.
2006. Sustainable Forestry - Change of Forest Management: From Man-made towards natural Forests. Germany, Cottbus BTU, training course organized by Brandenburg Technical University in Cottbus, sponsored by EU MACE Program, Marie Curie Actions, 20-23/11, 2006.
2006. Switzerland, Davos, summer school participation: MountecoSS "Mountain Ecology and Alpine Ecosystem Management" Summer School Weissfluhjoch, Organized by NFZ.forestnet (Nancy France, Freiburg Germany, WSL Switzerland), 9/10-9/16/2006.
2006. Germany, Rheinbraun, scientific meeting, RWE Power Aktiengesellschaft Rekultivierung Forstwirtschaft, Erfstadt, field experiments on Sophiehöhe external slope bank, invitation by RWE, 5/11-5/12/2006.
2006. Germany, Cottbus, Brandenburg Technical University in Cottbus: Training course - "Sustainable Forestry - change of forest management: from man-made towards natural forests". Organized by Chair of Soil protection and recultivation at the, financed by EU Marie Curie Project "Modern Agriculture in central and Eastern Europe (MACE)"; 11/20-11/23/2006.
2004. Germany, Cottbus, Brandenburg Technical University in Cottbus, scientific training, practical course of FT-IR w Central Lab of BTU, financed by grant of Polish Ministry of Science and Information Technology.9/9-9/16/2004.
2004. Germany, Finsterwalde, scientific training course, field experiments in frame of collaboration with Forschungsinstitut für Bergbaufolgelandschaften e.V. in Finsterwalde, financed by grant of Polish Ministry of Science and Information Technology, 9/16-9/24/2004.

2004. Practical course of analytical soil chemistry for FT-IR spectroscopy, laboratory analyses. Central Analytical Laboratory, Research Center Mining Landscape, BTU Cottbus, Germany, 14-15/9, 2004.

CONFERENCE PRESENTATIONS (selected):

2019. Pietrzykowski M. Ecosystem productivity and potential for Carbon Sequestration on reclaimed and afforested post-mining Sites. Convention of Society of American Foresters, Louisville KY, November the 1st., 2019. – oral presentation.
2019. Pietrzykowski, M., Reclamation of Sulfur Borehole Mine Sites and Environment Consequences of S Extraction. Oral presentation at the National Meeting of the American Society of Mining and Reclamation, Big Sky, MT: Welcome Back to Montana, the Land of Reclamation Pioneers, June 3-7, 2019.
2018. Pietrzykowski M.: New forestry paradigm? - current challenges in education and science. The 8th Annual Meeting, Conference of the Deans and Directors of European Forestry Faculties and Schools. Celebrating 70 Years Of Higher Education In Forestry At Transilvania University Of Brasov And 8th Edition Of The International Symposium Forest And Sustainable Development, 25th - 27th October 2018, Braşov, Romania. . Referat zamawiany.
2018. Pietrzykowski M.: Hard coal and lignite mine rehabilitation in Poland. International Workshop on Lignite and Hard Coal Mine Reclamation for Networking and Preparing an EU-funded R&D Project, 23-24 May 2018, Finsterwalde, Germany
2014. Poland, Krakow, Plenary session, oral presentation: Tree response to soil reconstruction on reclaimed post-mining sites – a key issue in forest ecosystem restoration. Second International Conference – Forestry in The Mountains and Industrial Region (Plenary session, oral presentation), September 22nd—23th September, Krakow, Poland.
2013. USA, Boston, Oral presentation: Risk of trace elements phytotoxicity and relationships between their accumulation in soil and plants in new ecosystems developed on reclaimed mine sites. Environmental Health 2013, Science and Policy to Protect Future Generations (by Elsevier (oral presentation), 3rd - 6th March 2013, Boston, USA.
2010. Ukraine, Lviv-Dublany, oral presentation: Soil Site Index (SIG) for decryption of habitat conditions on post-mine sites (participation sponsored by ACU in Krakow). IV International Scientific Conference „Czarna k. Ustrzyk 2010. Dolnych-Lwów-Dublany. 9/21-9/24/2010
2008. USA, Richmond, Virginia, oral presentation: “Macronutrient accumulation and relationships in a Scots pine (*Pinus sylvestris* L.) ecosystem on reclaimed opencast lignite mine spoil heaps in central Poland conference participation: “New Opportunities to Apply Our Science”, 25th Annual Meeting of American Society of Mining and Reclamation (ASMR) and International Affiliation of Land Reclamationists (IALR). Sponsored by Virginia Tech University and American Society of Mining and Reclamation ASMR, 6/14-6/19/2008.
2008. France, Nancy, poster presentation: Potential for carbon accumulation in reclaimed mine soil of pine ecosystem on post mining sites in Poland. The European Forest-Based Sector: Bio-Responses to Address Climate and Energy Challenges? 11/6-11/8/2008.
2007. Germany, Berlin: oral presentation: Succession or reclamation - a case study of forest ecosystem development on a sand mine cast (in Southern Poland). MACE "Modern Agriculture in Central and Eastern Europe" - Green Week Scientific Conference 2007, "Managing Economic, Social and Biological Transformations", Coordinated by Humboldt University in Berlin. Supported by EU MACE Program, Marie Curie Actions, The Committee

- of Food, Agricultural and Consumer Protection of the Germany Federal Parliament. Oral presentation 1/17-1/18/2007.
2006. Germany, Bad Salzungen. Oral presentation: Probleme der rekultivierung von Rückstandshalden der Kaliindustrie, presentation: Stand der Recultivierung von Bergbaufolgelandschaften in Polen. Practical and scientific agenda (meeting): Arbeitsgemeinschaft Bergbaufolgelandschaften e.V. 7 Fachtagung 12.05-14.05.2006, financed by Bergbaufolgelandschaften e.V., 5/12-5/14/2006.
2005. Czech Republic, Prague. oral presentation : Organic carbon and nitrogen accumulation and some humus properties of initial soils on reclaimed and abandoned for plant succession areas of Sand Mine works 'Szczakowa' (Southern Poland) (participation financed by Agricultural University in Krakow), International Conference on The Role of Long -term Field Experiments in Agricultural and ecological Sciences & Practical Solutions for Managing Optimum C and N Content in Agricultural Soils III, , 6/22-6/24/2005.
2003. Czech Republic, Prague. Six International Symposium & Exhibition on Environmental Contamination in Central and Eastern Europe and the Commonwealth of Independent States, Florida State University Fellowship, 9/1-9/4/2003.