
Physical Geography, Cartography and Geoinformatics

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The focus of the research is analysis of dynamics of spatial and time relations in physio geographical sphere and the impact of these dynamics on the society. The combination of Geography, Cartography, Geoinformatics and Remote sensing within one research direction is motivated by the fact that physical Geography works with spatial data and uses the geoinformatics/GIS tools. Current enhancement of Physical Geography and Geoecology has been influenced by recent boost of research of global environmental threats and risks. At the forefront of the interest of physical geographers and cartographers is especially the impact of climate changes on the different components of the environment. The second large field of research interest lies in comparison of current environmental processes with their past shape and their progress. Crucial findings about the dynamics of physio geographical phenomena can be derived from such comparison and can facilitate prediction of regional and global changes of the environment.

The individual research topics involve:

- environmental threats and risks and their impact on human society
- paleogeographical development of environment in Quaternary
- changes of dynamics of hydrological processes and ecology of watercourses as indicators of global climate changes and anthropogenetic environmental changes
- climate change impacts on landscape dynamics and landscape flows at various time scales
- interactions between climatic, hydrologic, geomorphic, vegetation and soil systems
- development of qualitative and quantitative indicators of phenomena in data obtained via remote sensing and spectroscopy
- algorithms of change detection using remote sensing and analysis of topographical data in digital modelling of (Earth)surface

Selected outputs

Physical Geography

- Blažková, Š.D., Blažek, V.D., Janský, B. (2017): Continuous simulation for computing design hydrographs for water structures. *Hydrological Processes*. 31: 2320–2329
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- Engel, Z., Mentlík, P., Braucher, R., Křížek, M., Pluháčková, M., Aster Team (2017): 10Be exposure age chronology of the last glaciation in the Western Tatra Mountains, central Europe. *Geomorphology* 293, 130-142
- Emmer, A., Vilímek, V., Zapata M.L. (2018) Hazard mitigation of glacial lake outburst floods in the Cordillera Blanca (Peru) The effectiveness of remedial works. *Journal of Flood Risk Management* 11, S489-S501
- Falátková, K., Šobr, M., Neureiter, A., Schöner, W., Janský, B., Häusler, H., Engel, Z., Beneš, V. (2019). Development of proglacial lakes and evaluation of related outburst susceptibility at the Adygin ice-debris complex, northern Tien Shan. *Earth Surface Dynamics*, 7(1), 301-320
- Gvoždíková, B., Müller, M. (2017): Evaluation of extensive floods in western/central Europe. *Hydrol. Earth Syst. Sci.* 21, 3715–3725
- Jenicek, M., Seibert, J., Staudinger, M. (2018): Modeling of future changes in seasonal snowpack and impacts on summer low flows in Alpine catchments, *Water Resources Research*, 54(1), 538-556
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- Bayer, T., Kočandrová, M. (2018): Reconstruction of Map Projection, its Inverse and Re-Projection. *Applications of Mathematics*, 63(4), 455-481

- Kupková, L., Červená, L., Suchá, R., Jakešová, L., Zagajewski, B., Brezina, S., Albrechtová, J. (2017): Classification of Tundra Vegetation in the Krkonose Mts. National Park Using APEX, AISA Dual and Sentinel-2A Data. *European Journal of Remote Sensing* [online], 50(1), 29-46
- Grešlová, P., Štych, P., Salata, T., Hernik, J., Knížková, I., Bičík, I., Jeleček, L. Prus, B., Noszczyk, T. (2019): Agroecosystem energy metabolism in Czechia and Poland in the two decades after the fall of communism: From a centrally planned system to market oriented mode of production. *Land Use Policy*. 2019, 82, 807-820
- Pazúr, R., Feranec, J., Štych, P., Kopecká, M., Holman, L. (2017): Changes of urbanised landscape identified and assessed by the Urban Atlas data: Case study of Prague and Bratislava. *Land Use Policy*, 2017, 61(Feb), 135-146