

# Johanna Ruth Blöcher

## *Curriculum Vitae and Summary of Publications*

### Education

- 10/17– **Ph.D. cand.**, *Environmental Modelling*, Czech University of Life Sciences (CULS), Prague, Czech Republic.
- 09/15–06/17 **M. Sc.**, *Environmental Modelling*, Czech University of Life Sciences (CULS), Prague, Czech Republic. Graduated with distinction.
- 10/10–08/14 **B. Sc.**, *Geoecology*, Technische Universität Carolo-Wilhelmina zu Braunschweig (TUBS), Braunschweig, Germany. ECTS grade A (top 10%).  
Including 2 Erasmus semesters at the School of Earth and Ocean Sciences, Cardiff University

### Scholarships, Awards and Grants

- 2021 **Kovař award**, *For contribution to the internationalisation of CULS*, Prague.
- 2020 **Rektor's award**, *Awarded for publication among the best as a Ph.D. candidate*, Prague.
- 2020 **Rektor's award**, *Awarded for D1 publication as an employee*, Prague.
- 2018 **Internal Grant**, *Research proposal ranked 1st with a three year funding period to carry out experiments on rain-on-snow*, Prague.
- 2017 **Prof. Babuška award**, *1st place, category S*, Awarded by Prof. Babuška and Czech Society for Mechanics and Union of Mathematicians and Physicists, Prague.
- 2017 **Rektor's awards**, *For thesis and excellent study results*, CULS, Prague.
- 10/15–06/17 **Dean Scholarship**, *Faculty of Environmental Sciences*, CULS, Prague.
- 10/13–09/14 **Germany Scholarship (Deutschlandstipendium)**, sponsored by Braunschweiger Hochschulbund e.V. and Stiftung zur Förderung der Wissenschaften an der Carolo-Wilhelmina.
- 10/10–09/11 **Performance Scholarship (Leistungstipendium)**, TUBS, Braunschweig.

### Consulted Theses

- 2019 - Čejkova, Veronika. "Analysis of rainwater flow in snowpack"
- 2019 - Bello, Ibrahim. "Image processing of flow characteristics of rain-on-snow experiments".
- 2020 - Dyrtr, Křýštof. "Experimental methods to investigate rainwater behaviour in the snowpack".
- 2020 - Juliana Arbelaez Gaviria. "Modeling of evaporation and its influence on surface temperature."
- 2021 - Arij Chmeis - "Prediction System for Soil Water Pressure Head."
- 2022 - Šimon Audes. "Zmena velikosti snehových zrn pusobením destove vody."

## Publications

### In preparation

- 2022 **Blöcher, J.R.**, Mayer, P. and Kuraz, M., 2021, Regularization strategy for discontinuity when modeling coupled water and heat flow in freezing unsaturated soil. Targeted at Cold Regions Science and Technology.
- 2022 **Blöcher, J.R.**, Diamantopoulos, E., Durner W., Iden, S. C, 2021, On the Validity of Coupled Water, Vapor and Heat Flow Theory for Bare Soil Evaporation and for Different Boundary Conditions. Water Resource Research.
- 2022 Jacka, L., Valtera, M., Juras, R., **Blöcher, J.R.**, Juricka, D., Deutscher J., Hemr O, Pavlasek, J, 2021, Tracking the subsurface and preferential-flow pathways in a pit-mound affected and undisturbed forest soil.

### Under review

- 2022 Biney, J. K. M, **Blöcher, J.R.**, Borůvka, L., Vašát R., 2021, Can in situ spectral measurements under disturbance-reduced environmental conditions help improve soil organic carbon estimation? (Under Review). Submitted to Science of The Total Environment
- 2022 Souckova, M., Juras, R., Dytrt, K., Moravec, V., **Blöcher, J. R.**, Hanel, M., 2021, What weather variables are important for wet and slab avalanches under a changing climate in low altitude mountain range in Czechia? (Under Review). Submitted to Natural Hazards and Earth System Sciences

### Published

- 2021 Biney, J. K. M, Radim Vašát, **Blöcher, J.R.**, Luboš Borůvka, Karel Němeček., 2021, Using an ensemble model coupled with portable X-ray fluorescence and visible near-infrared spectroscopy to explore the viability of mapping and estimating arsenic in an agricultural soil. Science of The Total Environment, 151805.
- 2021 Juras, R., **Blöcher, J. R.**, Jenicek, M, Hotovy, O. and Markonis, Y., 2021, What affects the hydrological response of rain-on-snow events in two mountain ranges in Central Europe? Journal of Hydrology, 603.
- 2021 Iden, S.C., **Blöcher, J.**, Diamantopoulous, E. and Durner, W., 2021, Capillary, film, and vapor flow in transient bare soil evaporation (1): Identifiability analysis of hydraulic conductivity in the medium to dry moisture range. Water Resources Research, 57.
- 2021 Biney, J. K. M, **Blöcher, J.R.**, Borůvka, L., Vašát R., 2021, Does the limited use of orthogonal signal correction pre-treatment approach to improve the prediction accuracy of soil organic carbon need attention? Geoderma, 388.
- 2021 Balvín, P., Vizina, A., Nesládková, M., **Blöcher, J.R.**, Makovcová, M., Moravec, V., Hanel, M., 2021, Minimum Residual Flows for Catchments in the Czech Republic. Water 13, 689.
- 2020 **Blöcher, J.R.**, J.R., Ward, M.R., Matthaei, C.D., Piggott, J.J., 2020. Multiple stressors and stream macroinvertebrate community dynamics: Interactions between fine sediment grain size and flow velocity. Science of The Total Environment 717, 137070.
- 2019 Heinze, T., **Blöcher, J.R.**, 2019. A model of local thermal non-equilibrium during infiltration. Advances in Water Resources 132, 103394.

2019 Iden, S.C., **Blöcher, J.R.**, Diamantopoulos, E., Peters, A., Durner, W., 2019. Numerical test of the laboratory evaporation method using coupled water, vapor and heat flow modelling. *Journal of Hydrology* 570, 574–583.

## Languages

German Native  
English Proficient (C2)  
Czech Pre-intermediate

## Teaching Experience

02/17– **Teaching Assistant**, Dep. of water resources and environmental modeling, CULS.  
○ Groundwater Hydraulics  
○ Contaminant Transport in the Watershed  
○ Applied Hydraulics and Hydrology  
○ Hydrogeology  
○ Transport of contaminants in porous media

## Computer skills

Programming R (since 2011), Fortran (GCC, since 2016), GNU Bash (since 2016), Matlab (2 semesters, B. Sc. thesis project), Python (2 Coursera courses, Data Camp), Pascal (2 semesters)  
IDE R Studio (including shiny)  
Software GEE, ArcGIS, Git, Hydrus 1D  
Platforms Mac OSX, Linux, Windows  
Office L<sup>A</sup>T<sub>E</sub>X, MS Office