

Alexander G. Hurley

DOCTORAL RESEARCHER

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Goal

I wish to involve myself in innovative, collaborative and inter-disciplinary research in environmental sciences and applied ecology, enabling evidence-based decision-making, ideally following my current research foci in (wetland) ecohydrology, tree/forest growth dynamics and plant physiology. To achieve this, I continuously dedicate myself to the generation of data, (software) tools and rigorous analyses in a transparent, accessible and reproducible manner.

Key Achievements

- I contributed to restoration efforts of large-scale open-pit mining of Tar Sands (Alberta, Canada) by delivering novel insights on Aspen-forested catchments and ecohydrological wetland-forest interactions in natural analogue sites; this work constitutes the main body of research for my doctoral thesis and was part of the "Hydrology, Ecology And Disturbance in the Western Boreal Forest" projects (HEAD3).
- I contributed to and led efforts to promote open and reproducible science as well as computer literacy. These efforts represent my passion for democratizing access to and uptake of data science and analytical approaches to develop open evidence bases. I have done so through my personal web site, developing software, delivering high-quality workshops and seminars, as well as by jointly authoring a review on the current and future use of R (programming language) in the field of hydrology, which is currently the most viewed article of 2019 in *Hydrology and Earth System Sciences* (see publications).

Education

University of Birmingham

Birmingham, GB

DOCTORAL RESEARCHER (PHD)

2015 - present

- **Thesis:**
Ecohydrological role of small, forested wetlands in the sub-humid Boreal Plain (Canada).
N. Kettridge, S. Krause (UoB)

University of East Anglia

Norwich, GB

APPLIED ECOLOGY, EMMC MSC (DISTINCTION)

2014 - 2015

- **Thesis:**
Simulating real world ecosystems: how does carnivore functional diversity affect ecosystem functioning?
M. Harfoot (UNITED NATIONS EP WCMC), *D. Purves* (MICROSOFT RESEARCH), *R. Davies* (UEA)
- **Modules:**
Modelling Environmental Processes (developed 2-D advection-diffusion model in MatLab),
Catchment Water Resources (wrote HBV Rainfall-Runoff model in R applying Monte-Carlo and GLUE),
Multivariate Statistics

Universidade de Coimbra

Coimbra, PT

APPLIED ECOLOGY, EMMC MSC (DISTINCTION)

2014 - 2014

- **Modules:**
Biodiversity Management and Conservation (network analyses, population dynamics),
Environmental Management (nutrient cycling), Modelling complex Ecological Systems

Universidad San Francisco de Quito

Quito, EC

APPLIED ECOLOGY, EMMC MSC (DISTINCTION)

2014 - 2014

- **Modules:**
Water Resource Management of Andean Highlands

University of Poitiers

Poitiers, FR

APPLIED ECOLOGY, EMMC MSC (DISTINCTION)

2013 - 2014

- **Modules:**
Biostatistics

Universität Bayreuth

Bayreuth, DE

BSC GEOÖKOLOGIE

2010 - 2013

- **Thesis:**
Mudpots as proxies for volatile metalloid emissions in the Yellowstone NP.
B. Planer-Friedrich, J. Arndt (UBT)
- **Modules:**
Ecological Modelling, Statistics in R, Multivariate Statistics in R, Environmental Biogeochemistry, Hydrology,
Hydrochemistry, Soil Science, Meteorology, Climatology, Microbiology, Mathematics for Natural Sciences 101/102, Physics 101

Previous employment and research experience

University of Birmingham

Birmingham

TEACHING ASSOCIATE

2015 - 2019

- Wetland Environments (BSc, 25908), Biodiversity and Conservation Management (BSc, 27192), Climate change in the Earth System (BSc, 30021), Environmental Analysis and Modelling (MSc, PhD 29284), Air Quality Data Analysis and Interpretation (MSc, PhD 28981), Statistics Helpdesk (BSc)

Leibniz-Institut für Gewässerökologie und Binnenfischerei

Berlin

RESEARCH INTERN

2013 - 2013

- GROUNDWATER-SURFACE WATER EXCHANGE. Assists in data collection (sediment heat pulse, surface water temperature), analyses and visualization of temperature tracer experiments.

Universität Bayreuth

Bayreuth

RESEARCH ASSISTANT

2011 - 2013

- ECOSYSTEM FUNCTION UNDER EXTREME METEOROLOGICAL EVENTS. Sampling, maintenance, construction, data administration, induction of new assistants for long-term ecological experiment.

Universität Bayreuth

Bayreuth

RESEARCH ASSISTANT

2010 - 2011

- CARBON CYCLING IN AGRICULTURAL SOILS. sample collection, preparation and fatty acid extraction.

Awards

- 2017 British Ecological Society Training and Travel Grant
- 2016 Alpkit Personal Development Grant
- 2014 Merit Grant for Outstanding Academic Achievement (Portuguese Government)
- 2013 Erasmus Mundus scholarship of the European Commission for Master's of Excellence

Skills

- Data analyses (R, MATLAB, Excel),
- Univariate and multivariate Statistics; experience with time series analyses
- Numerical modelling
- Spatial analyses (i.e. GIS, ESRI ARCMAP, RGDAL)
- Environmental monitoring: micro-meteorology, groundwater/soil water (potential), plant physiology (water-use, leaf conductance, radial growth)
- Dendro-ecological/-chronological sampling, processing and analyses
- Wood anatomical sampling, processing and analyses
- Wetland/habitat and soil classification
- Biogeochemical sampling and processing
- R Software and web development (SHINY),
- Version control (GIT, GITHUB) and continuous integration (TRAVISCI),
- Data(base) management (advanced: R; basic: MS ACCESS, SQL),
- Reproducible and open science (R, RMARKDOWN, DOCKER, GITHUB)
- Project management
- Latex, OVERLEAF, MS OFFICE, RMARKDOWN (R), BLOGDOWN (R), XARINGAN (R)
- English and German native speaker

Activities

- Main convener of "Using R in Hydrology" EGU AGM Short-Course; Vienna, Austria (2019)
GitHub: https://github.com/hydrosoc/rhydro_EGU19, DOI: <http://doi.org/10.5281/zenodo.3236979>
- OpenNASA Datanaut Citizen Data Scientist / Volunteer (2018 - present)
- Co-convener of "Using R in Hydrology" EGU AGM Short-Course; Vienna, Austria. (2018)
GitHub: https://github.com/hydrosoc/rhydro_EGU18, DOI: <http://doi.org/10.5281/zenodo.2554009>
- Supervised field work for 9 under-graduate and 1 post-graduate dissertations (2016 - 2017)
- FishAct (frm. The Black Fish) Social Media Coordinator Germany (2014 - 2015)
- Course Representative on Post-Graduate Taught Affairs Committee (2014)

Software

- Alexander Hurley (2019). **lib2bib**: easily cite and acknowledge open-source R software. R package version 0.0.900. <https://the-hull.github.io/lib2bib/index.html>
- Richard L. Peters *et al.* (2018). **RAPTOR**: Row and Position Tracheid organizer in R. <https://doi.org/10.1016/j.dendro.2017.10.003>. (Contributed to code refactoring, continuous integration and testing)
- Alexander Hurley (2017). **BIFoR Data and Outreach Platform**: R SHINY portal prototype. <https://aglhurley.shinyapps.io/bifor/>

Seminars, workshop contributions and outreach

- 2019 Obtaining, cleaning and visualizing hydrological data with R (EGU, Vienna, Austria)
- 2019 Staying up-to date: automating tasks from downloading data to reporting (EGU, Vienna, Austria)
- 2018 Processing, modelling and visualizing hydrological data in R. (EGU, Vienna, Austria)
- 2018 Intro to version control and project management with git, GitHub and RStudio (UoB, Birmingham, UK)
- 2016 Introduction to analyses and data management with R (UoB, Birmingham, UK)
- 2016 Graduation Ceremony Address - International Master's in Applied Ecology (UoP, Poitiers, France)

Publications and conference contributions

I have authored two publications (co-author and joint contribution) in scientific journals highly relevant to my research foci and in formats representing my dedication to open access science. Both of these publications have been prepared without my PhD promoters. I am currently preparing three chapters of my thesis for submission.

PEER-REVIEWED JOURNALS

1. Peters, RL, D Balanzategui, AG HURLEY, G von Arx, AL Prendin, HE Cuny, J Björklund, DC Frank, and P Fonti (2018). RAPTOR: Row and Position Tracheid Organizer in R. *Dendrochronologia* **47**, 10–16.
2. Slater, LJ, G Thirel, S Harrigan, O Delaigue, A HURLEY, A Khouakhi, I Prodoscimi, C Vitolo, and K Smith (2019). Using R in Hydrology: A Review of Recent Developments and Future Directions. *Hydrology and Earth System Sciences Discussions* **2019**, 1–33.

CONFERENCE PAPERS / PRESENTATIONS

1. HURLEY, A, N Kettridge, K Devito, K Hokanson, and S Krause (2017). A Concept of Ephemeral Wetlands as Water-Transmitting Landscape Units in Canada's Western Boreal Plain. In: *EGU General Assembly Conference Abstracts*. Vol. 19, pp.13113.
2. Probert, S, N Kettridge, K Devito, and A HURLEY (2017). Ecohydrology of the Wetland-Forestland Interface: Hydrophobicity in Leaf Litter and Its Potential Effect on Surface Evaporation. In: *EGU General Assembly Conference Abstracts*. Vol. 19, pp.8445.
3. HURLEY, A, N Kettridge, K Devito, K Hokanson, R Leonard, S Krause, and JM Waddington (2017). Spatio-Temporal Dynamics of Evapotranspiration from Forested, Ephemeral Wetlands and Its Implication for Hydrologic Connectivity in the Western Boreal Plain in Alberta, Canada. In: *EGU General Assembly Conference Abstracts*. Vol. 19, pp.13592.
4. HURLEY, A, N Kettridge, K Devito, K Hokanson, R Leonard, I Heinrich, D Balanzategui, and S Krause (2018). Assessing the Ecohydrological Role of Cryptic, Forested Wetlands in the Boreal Plain (Canada): Local-Scale Effects with a Potential Regional Impact. In: *EGU General Assembly Conference Abstracts*. Vol. 20, pp.16349.
5. HURLEY, A, N Kettridge, J Waddington, K Devito, K Hokanson, and S Krause (2018). Estimating Sub-Canopy Evapotranspiration and Resistances from Small-Scale, Forested Wetlands in the Sub-Humid Boreal Plain. In: *EGU General Assembly Conference Abstracts*. Vol. 20, pp.15944.
6. HURLEY, A, KJ Devito, KJ Hokanson, CA Mendoza, and N Kettridge (2019). Dynamic Connectivity within Small, Forested Wetlands Impacts Runoff Generation in Aspen-Dominated Catchments of the Sub-Humid Boreal Plain (Canada). In: *EGU General Assembly Conference Abstracts*. Vol. 21, pp.14785.
7. Balanzategui, D, AG HURLEY, RL Peters, V Kuznetsova, I Heinrich, and G Helle (2018). Climate Response of Scots Pine Tracheid Cells across the European-Eurasian Maritime-Continental Climate Gradient. In: TRACE.
8. Balanzategui, D, KU Heußner, T Wazny, G Helle, RL Peters, AG HURLEY, and I Heinrich (2017). Wood Anatomical Parameters of Lowland European Oak and Scots Pine Asproxies for Climate Reconstructions. In: TRACE.
9. Kettridge, N, Emma Shuttleworth, Jonay Neris, Stefan Doerr, Christina Satin, Claire Belcher, Gareth Clay, Danny Croghan, S Krause, A HURLEY, Kieran Khamis, Angeliki Kourmouli, Samantha Leader, and Sami Ullah (2019). The Impact of Wildfire on Contaminated Moorland Catchment Water Quality. In: *EGU General Assembly Conference Abstracts*. Vol. 21, pp.7772.