

Petr Keil – Curriculum Vitae

CONTACT INFORMATION Department of Environmental Sciences
Czech University of Life Sciences in Prague
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EDUCATION

Ph.D., Ecology 2006–2010
Department of Ecology, Faculty of Science, **Charles University in Prague**, Czech Republic. Dissertation: *Macroecology of European invertebrates: spatial and temporal patterns extracted from heterogeneous data*. Advisor: [David Storch](#).

M.S., Zoology & Entomology 2003–2005
Department of Zoology, Faculty of Biology, **University of South Bohemia**, Ceske Budejovice, Czech Republic. Advisor: [Martin Konvicka](#). I spent one semester of 2004 at **Université de Rennes 1**, France, as an EU-funded Erasmus exchange student.

B.S., Biology 2000–2003
Faculty of Biology, University of South Bohemia, Ceske Budejovice, Czech Republic

PROFESSIONAL EXPERIENCE

Researcher 2020–present
Czech University of Life Sciences (CZU), Prague, Czech Republic.

Postdoc 2015–2020
German Centre for Integrative Biodiversity Research – **iDiv**, Leipzig, Germany.

Postdoc 2011–2014
Dept. of Ecology and Evolutionary Biology, **Yale University**, USA. First year funded by [Map of Life](#) project of [Walter Jetz](#). Since 2012 funded by EU Marie-Curie fellowship.

Research associate 2011, 2012–2015
Center for Theoretical Study – CTS, **Charles University in Prague**, Czech Republic.

Early-stage research trainee 2008 (5 months), 2009 (2 months)
Faculty of Biological Sciences, **University of Leeds**, UK. Funded by a Marie Curie Fellowship for early-stage researchers. Advisors: [Koos Biesmeijer](#) & [William E. Kumin](#).

Research associate 2007–2010
Dept. of Ecology, Faculty of Science, Charles University in Prague, Czech Republic. The position was funded from various grants, and was held parallel to my Ph.D. studies.

Technician 2006
Department of Zoology, **University of Cambridge**, UK. Six months as a technician in the lab of [Berthold Hedwig](#). Performed behavioural experiments with crickets.

PEER-REVIEWED
ARTICLES

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42. Arle E., Zizka A., [Keil P.](#), Winter M., Essl F., Knight T., Weigelt P., Jimenez-Munoz M. & Meyer C. (2021) bRacatus: a method to estimate the accuracy and biogeographical status of georeferenced biological data. *Methods in Ecology and Evolution*, in press.
 41. Jurburg S.D., [Keil P.](#), Singh B.K. & Chase J.M. (2021) All together now: Limitations and recommendations for the simultaneous analysis of all eukaryotic soil sequences. *Molecular Ecology Resources*, in press.
 40. [Keil P.](#), Wiegand T., Toth A.B., McGlinn D.J., & Chase J.M. (2021) Measurement and analysis of interspecific spatial associations as a facet of biodiversity. *Ecological Monographs*, in press.
 39. Sporbert M., [Keil P.](#), ... & Welk E. (2020) Testing macroecological abundance patterns: The relationship between local abundance and range size, range position and climatic suitability among European vascular plants. *Journal of Biogeography*, 35: 56-67. [[link](#)]
 38. Craven D., van der Sande M.T., ..., & [Keil P.](#) (2020) A cross-scale assessment of productivity-diversity relationship. *Global Ecology and Biogeography*, 29: 1940-1955. [[link](#)]
 37. [Keil P.](#) (2019) Z-scores unite pairwise indices of ecological similarity and association for binary data. *Ecosphere*, 10: e02933. [[link](#)].
 36. Isaac N.J.B., Jarzyna M., [Keil P.](#), ... & O'Hara B. (2019) Data integration for large scale models of species distributions. *Trends in Ecology and Evolution*, 35: 56-67. [[link](#)]
 35. [Keil P.](#) & Chase J.M. (2019) Global patterns and drivers of tree diversity integrated across a continuum of spatial grains. *Nature Ecology and Evolution*, 3: 390-399. [[link](#)].
 34. Sporbert M. et al. (2019) Assessing sampling coverage of species distribution in biodiversity databases. *Journal of Vegetation Science*, 30: 620-632. [[link](#)].
 33. Ren H., [Keil P.](#) et al. & Jetz W. (2019) Environment- and trait-mediated scaling of tree occupancy in forests worldwide. *Global Ecology and Biogeography*, 28: 1155-1167. [[link](#)].
 32. Jetz W. et al. (2019) Essential biodiversity variables for mapping and monitoring species populations. *Nature Ecology and Evolution*, 3: 539-551. [[link](#)].
 31. [Keil P.](#), MacDonald A.A.M., Ramirez K.S., Bennett J.M., Garcia-Pena G.E., Yguel B., Bourgeois B. & Meyer C. (2018) Macroecological and macroevolutionary patterns emerge in the universe of GNU/Linux operating systems. *Ecography*, 41: 1788-1800. [[link](#)]
 30. [Keil P.](#), Pereira H.M., Cabral J.S., Chase J.M., May F., Martins I.S. & Winter M. (2018) Spatial scaling of extinction rates: theory and data reveal non-linearity, and a major upscaling and downscaling challenge. *Global Ecology and Biogeography*, 27: 2-13. [[link](#)]

29. Shade A., Dunn R.R., Blowes S.A., [Keil P.](#), Bohannan B.J.M., Hermann M., Kusel K., Lennon J.T., Sanders N.J., Storch D. & Chase J. (2018) Macroecology to unite all life, great and small. *Trends in Ecology and Evolution*, 33: 731-744. [[link](#)]
28. Dormann C.F. *et al.* (2018) Model averaging in ecology: a review of Bayesian, information-theoretic and tactical approaches. *Ecological Monographs*, 88: 485-504. [[link](#)]
27. Gratton P., Marta S., Bocksberger G., Winter M., [Keil P.](#), Trucchi E. & Kuhl H. (2017) Which latitudinal gradients for genetic diversity? *Trends in Ecology and Evolution*, 32: 724-726. [[link](#)]
26. [Keil P.](#), Storch D. & Jetz W. (2015) On the decline of biodiversity due to area loss. *Nature Communications*, 6: 8837. [[link](#)]
25. Quintero I., [Keil P.](#), Jetz W. & Crawford F.W. (2015) Historical biogeography using species geographical ranges. *Systematic Biology*, 64: 1059-1073. [[link](#)]
24. Tropek R., Sedlacek O., Beck J., [Keil P.](#), Musilova Z., Simova I. & Storch D. (2014) Comment on "High resolution global maps of 21-st century forest cover change". *Science*, 344: 981. [[link](#)]
23. [Keil P.](#), Wilson A.O. & Jetz W. (2014) Uncertainty, priors, autocorrelation and disparate data in downscaling of species distributions. *Diversity and Distributions*, 20: 797-812. [[link](#)]
22. Sturrock H.J.W, Cohen J.M., [Keil P.](#), Tatem A.J., Menach A.L., Ntshalinthsali N.E., Hsiang M.S. & Gosling R.D. (2014) Fine-scale malaria risk mapping from routine aggregated data. *Malaria Journal*, 13: 421.
21. [Keil P.](#) & Jetz W. (2014) Downscaling the environmental associations and spatial patterns of species richness. *Ecological Applications*, 20: 797-812. [[link](#)]
20. Pechacek P., Stella D., [Keil P.](#) & Kleisner K. (2014) Environmental effects on the shape variation of male ultraviolet patterns in the brimstone butterfly (*Gonepteryx rhamni*, Pieridae, Lepidoptera). *Naturwissenschaften*, 101, 1055-1063. [[link](#)]
19. Straka J., Cerna K., Machackova L., Zemenova M. & [Keil P.](#) (2014) Life span in the wild: the role of activity and climate in natural populations of bees. *Functional Ecology*, 28: 1235-1244. [[link](#)]
18. [Keil P.](#), Belmaker J., Wilson A.M., Unitt P. & Jetz W. (2013) Downscaling of species distribution models: a hierarchical approach. *Methods in Ecology and Evolution*, 4: 82-94. [[link](#)]
17. Carvalheiro L., Kunin W.E., [Keil P.](#) & 16 authors (2013) Biodiversity declines and biotic homogenization have slowed down for NW-European pollinators and plants. *Ecology Letters*, 16: 870-878. [[link](#)]
16. Storch D., [Keil P.](#) & Jetz W. (2012) Universal species-area and endemics-area relationships at continental scales. *Nature*, 488: 78-81. [[link](#)]
15. [Keil P.](#), Schweiger O., Kuhn I., Kuussaari M., Kunin W.E., Settele J., Henle K., Brotons L., Pe'er G., Lengyel S., Moustakas A., Steinicke H. & Storch D. (2012) Patterns of beta diversity in Europe: the role of climate, land cover and distance across scales. *Journal of Biogeography*, 39: 1473-1486. [[link](#)]
14. Kleisner K., [Keil P.](#) & Jaros F. (2012) Biogeography of elytral ornaments in Palearctic genus Carabus: disentangling the effects of space, evolution and environment at a continental scale. *Evolutionary Ecology*, 26: 1025-1040. [[link](#)]

13. Henle et al. (2012) Nature Conservation – a new dimension in Open Access publishing bridging science and application. *Nature Conservation*, 1: 1-10. [[link](#)]
 12. [Keil P.](#), Biesmeijer J.C., Barendregt A., Reemer M. & Kunin W.E. (2011) Biodiversity change is scale-dependent: an example from dutch and UK hoverflies (Diptera, Syrphidae). *Ecography*, 34: 392-401. [[link](#)]
 11. Simova I., Storch D., [Keil P.](#), Boyle B., Phillips O.L. & Enquist B.J. (2011) Global species-energy relationship in forest plots: role of abundance, temperature and species' climatic tolerances. *Global Ecology and Biogeography*, 6: 842-856. [[link](#)]
 10. [Keil P.](#), Herben T., Rosindell J. & Storch D. (2010) Predictions of Taylor's power law, density dependence and pink noise from a neutrally modelled time series. *Journal of Theoretical Biology*, 265: 78-86. [[link](#)]
 9. Sizing A.L., Storch D. & [Keil P.](#) (2009) Rapoport's rule, species tolerances, and the latitudinal diversity gradient: geometric considerations. *Ecology*, 90: 3575-3586. [[link](#)]
 8. [Keil P.](#) & Hawkins B.A. (2009) Grids versus regional species lists: are broad-scale patterns of species richness robust to the violation of constant grain size? *Biodiversity and Conservation*, 18: 3127-3137. [[link](#)]
 7. Dixon A.F.G., Honek A., [Keil P.](#), Kotela M.A., Sizing A.L. & Jarosik V. (2009) Relationship between the minimum and maximum temperature thresholds for development in insects. *Functional Ecology*, 23: 257-264. [[link](#)]
 6. [Keil P.](#), Dziock F. & Storch D. (2008) Geographical patterns of hoverfly (Diptera, Syrphidae) functional groups in Europe: inconsistency in environmental correlates and latitudinal trends. *Ecological Entomology*, 33: 748-757. [[link](#)]
 5. Langrova I., Makovcova K., Vadlejch J., Jankovska I., Petrtyl M., Fetchner J., [Keil P.](#), Lytvynets A. & Borkovcova M. (2008) Arrested development of sheep strongyles: onset and resumption under field conditions of Central Europe. *Parasitology Research*, 103: 387-392. [[link](#)]
 4. [Keil P.](#), Simova I. & Hawkins, B.A. (2008) Water-energy and the geographical species richness pattern of European and North African dragonflies (Odonata). *Insect Conservation and Diversity*, 1: 142-150. [[link](#)]
 3. Konvicka M., Novak J., Benes J., Fric Z., Bradley J., [Keil P.](#), Hrcak J., Chobot K. & Marhoul P. (2007) The last population of the Woodland Brown butterfly (*Lopinga achine*) in the Czech Republic: habitat use, demography and site management. *Journal of Insect Conservation*, 12: 549-560. [[link](#)]
 2. [Keil P.](#) & Konvicka M. (2005) Local species richness of Central European hoverflies (Diptera: Syrphidae): a lesson taught by local faunal lists. *Diversity and Distributions*, 11: 417-426. [[link](#)]
 1. [Keil P.](#) (2005) Microhabitat preferences of Stiletto-flies larvae (Diptera: Therevidae) in mountain primeval forest. *Studia Dipterologica*, 12(1): 87-92. [[link](#)]
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CHAPTERS,
PREPRINTS,
PROCEEDINGS

5. Viana D.S., [Keil P.](#) & Jeliaskov A. (2019) Partitioning environment and space in species-by-site matrices: a comparison of methods for community ecology and macroecology. *BioRxiv*
4. Hines J.& [Keil P.](#) (2019) Common competitors and rare friends. *Nature Ecology and Evolution*, 4: 8-9.[\[link\]](#)
3. Bitner J., Schejbalova A., Bartova K., Varella J., Krejcová L., Weiss P., Kleisner K., [Keil P.](#) & Kvapilova K. (2015) Prevalence of zoophilia in Czech sado-masochistic community. *Journal of Sexual Medicine*, 12: 41-41.
2. [Keil P.](#) (2014) Limits of uncertainty about estimates of probability of ecological events. *PeerJ PrePrints* , 2:e446v1. [\[link\]](#)
1. Storch D., [Keil P.](#) & Kunin W.E. (2014) Scaling communities and biodiversity. Pages 66-77. In: *Scaling in Ecology and Biodiversity Conservation*, Pensoft. Eds: Henle et al. [\[link\]](#)

SERVICE FOR
JOURNALS

Associate editor of *Global Ecology and Biogeography* (Wiley) 2015-present

Associate editor of *Nature Conservation* (Pensoft Publishers) 2012-present

Reviewer for: *ERC, Nature Ecology & Evolution, Nature Communications, Ecology Letters, Ecography, Global Ecology and Biogeography, Methods in Ecology and Evolution, Journal of Biogeography, American Naturalist, Journal of Animal Ecology, Diversity and Distributions, Oikos, Perspectives in Plant Ecology Evolution and Systematics, Journal of Geographic Information Systems, Acta Oecologica, Biodiversity and Conservation, Biological Conservation, Population Ecology, Ecological Modelling, European Journal of Entomology, Polish Journal of Ecology, Journal of Vegetation Science, Ecology & Evolution, Ethology Ecology and Evolution, Ecological Applications, Zapadoceske Entomologicke Listy, Environmental Microbiology.*

CITATION
METRICS

Accessed 29 Nov 2020:

Google Scholar: 1,859 citations, h-index = 23.

STUDENTS

Francois Leroy, PhD student at Czech University of Life Sciences (advisor, ongoing)
Maria Sporbert, PhD student at Martin Luther University of Halle-Wittenberg (co-advisor, finished)

Eduardo Arle, PhD student at Leipzig University (PhD advisory committee member, ongoing)

Amanda Ratier Backes, PhD student at Leipzig University (PhD advisory committee member, ongoing)

Adam Klimes, Master student at Charles University (advisor, finished in 2016)

LECTURING	<p>Bayesian Biostatistics - University of Leipzig, Charles University 2014-2017 Three-day intensive practical course for 15-20 students. [link]</p> <p>Spatial Biodiversity Analysis Methods - Yale University, USA 2013 Taught together with Adam M. Wilson, Giuseppe Amatulli and Walter Jetz. [link]</p> <p>Spatial Scale in Biodiversity Science - Yale University, USA 2012 Graduate course (Yale EEB 713 01 - S13) for ca. 10 students, taught with prof. Walter Jetz. [link to syllabus]</p> <p>Course of R Programming - Charles University, Czech Republic 2009–2011 Graduate course of R programming “<i>R for Life</i>” for ca. 20 students at Faculty of Science.</p> <p>Foundations of Ecology - Charles University, Czech Republic 2007–2009 Principal lecturer of graduate course “<i>Foundations of Ecology</i>” for ca. 20 students of Social and Cultural Ecology at Faculty of Humanities (FHS).</p> <hr/>
GRANTS, FUNDING	<p>Czech University of Life Sciences 2020–2023 3-year grant Research Excellence in Environmental Sciences (REES)</p> <p>sDiv Fellowship, iDiv, Leipzig, Germany 2015–2017 2-year independent postdoctoral project “<i>Assessing extinction: Crossover of geometrical, macroecological and Bayesian perspectives</i>”.</p> <p>Marie Curie Fellowship (IOF) 2012–2015 EU FP7-PEOPLE, Project WORLDIVERSITY – “<i>Linking global species and beta diversity to individual species distributions at multiple phylogenetic and spatial scales</i>” (# 302868). Host: Yale University, USA.</p> <p>Grand Agency of Charles University 2008–2010 Co-PI (with Irena Simova) on project GAUK106108 “<i>The effect of energy availability and environmental heterogeneity on species diversity of plants and invertebrates</i>”.</p> <hr/>
AWARDS	<p>Dean’s prize for the best PhD thesis defended in 2010 at Faculty of Science, Charles University in Prague.</p> <hr/>
SKILLS	<p>Software: R, C++, Windows, Linux, Bash, Grass GIS, ArcGIS, QGIS, OpenBUGS, JAGS, STAN, Canoco, L^AT_EX, HTML, CSS, SQL, Markdown, WordPress, Graphic editors (GIMP, InkScape, Corel and Adobe suites).</p> <p>Statistics: GLM, hierarchical (mixed-effects) models, GAM, ordinations, spatial statistics, time series analysis, survival analysis, structural equations models, data visualization, machine learning, model selection, model diagnostics, predictive inference, Monte-Carlo tests, bootstrap, Bayesian inference, likelihood optimization.</p> <p>Languages: English (excellent); German, Spanish, French (intermediate); Czech (nat.).</p> <hr/>
REFERENCES	<p>Prof. Jonathan M. Chase, iDiv. ☎+49 341 9733120. jonathan.chase@idiv.de</p> <p>Dr. Marten Winter, iDiv. ☎+49 341 9733129. marten.winter@idiv.de</p> <p>Prof. Walter Jetz, Yale University. ☎+1 2034327540. walter.jetz@yale.edu</p>

Prof. **David Storch**, Charles University. ☎+420 221183535. storch@cts.cuni.cz

Prof. **William Kunin**, University of Leeds. ☎+440 1133432857. w.e.kunin@leeds.ac.uk