

Maximilian H.K. Hesselbarth (he/him)

Research Scholar

Biodiversity, Ecology, and Conservation Group | International Institute for Applied Systems Analysis (IIASA)

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Professional Appointments

International Institute for Applied Systems Analysis (IIASA)	Laxenburg, Austria
Research Scholar; Biodiversity, Ecology, and Conservation Group	2023/02/15 - ongoing
University of Michigan	Ann Arbor, USA
Postdoctoral Fellow; Coastal Ecology and Conservation Lab	2020/08/01 - 2022/12/31

Education

University of Goettingen	Goettingen, Germany
Dr. rer. nat; Department of Ecosystem Modelling	2016/10/01 - 2020/04/06
University of Goettingen	Goettingen, Germany
Master of Sciences; Ecosystem Analysis and Modelling	2014/10/01 - 2016/11/15
University of Applied Sciences and Arts	Goettingen, Germany
Bachelor of Sciences; Forestry	2011/10/01 - 2014/07/07

Internships / Research visits

Iowa State University	Ames, USA
Department of Ecology, Evolution and Organismal Biology	2017/10/18 - 2017/12/21
University of KwaZulu-Natal	Pietermaritzburg, South Africa
School of Life Sciences	2016/03/07 - 2016/08/01
North-West University	Potchefstroom, South Africa
Land Degradation and Restoration Ecology	2016/03/07 - 2016/08/01
Northwest German Forestry Research Institute	Goettingen, Germany
Department of Growth Modeling	2015/09/01 - 2015/10/01
SilvaTerra Ltd.	Lilongwe, Malawi
Forest Consulting and Research	2013/11/04 - 2014/03/30
Wise Batten Inc.	Estill, USA
Forestry Services and Wildlife Management	2011/06/02 - 2011/08/01
State Forestry Department Heuberg	Messtetten, Germany
Forest Management	2010/08/02 - 2010/08/27
State Forestry Department Heuberg	Messtetten, Germany
Forest Management	2009/08/31 - 2009/09/11

Conferences / Workshops (attended)

52nd Annual Meeting of the Ecological Society of Germany, Austria and Switzerland	Leipzig, Germany 2023/09/12 - 2023/09/16
World Congress International Association of Landscape Ecology	Milano, Italy 2019/07/01 - 2019/07/05
48th Annual Meeting of the Ecological Society of Germany, Austria and Switzerland	Vienna, Austria 2018/09/10 - 2018/09/14
Spatial Modelling <i>inlabru</i>	St. Andrews, UK 2018/03/26 - 2018/03/30
Deep Learning with <i>Keras</i> and <i>TensorFlow</i>	Solingen, Germany 2018/01/18 - 2018/01/19
Young Modellers in Ecology	Freiburg, Germany 2017/04/29 - 2017/05/05
Advances in Spatial Analysis of Multivariate Ecological Data	Port Talbot, UK 2017/04/02 - 2017/04/07
Fire Protection and Management	Prodromos, Cyprus 2013/09/07 - 2013/09/22

Publications

Copies of all publications and talks can be found on my homepage

† Authors contributed equally

Articles

- Nowosad, J., Hesselbarth, M.H.K. (2024). The landscapemetrics and motif packages for measuring landscape patterns and processes. arxiv, stat.ME. <https://doi.org/10.48550/arxiv.2405.06559>
- Hesselbarth, M.H.K., Wiegand, K. (2024). A simulation study comparing common methods for analyzing species-habitat associations of plants. *Journal of Vegetation Science* 35, e13243. <https://doi.org/10.1111/jvs.13243>
- Shayka, B.F., Hesselbarth, M.H.K., Schill, S.R., Currie, W.S., Allgeier, J.E. (2023). The natural capital of seagrass beds in the Caribbean: evaluating their ecosystem services and blue carbon trade potential. *Biology Letters* 19:20230075. <https://doi.org/10.1098/rsbl.2023.0075>
- Rubio-Camacho, E.A., Hesselbarth, M.H.K., Flores-Garnica, J.-G., Acosta-Mireles, M. (2023). Tree mortality in mature temperate forests of central Mexico: A spatial approach. *European Journal of Forest Research* 142, 565–577. <https://doi.org/10.1007/s10342-023-01542-3>
- Simpkins, C.E., Hanß, S., Spangenberg, M.C., Salecker, J., Hesselbarth, M.H.K., Wiegand, K. (2022). spectre: An R package to estimate spatially-explicit community composition using sparse data. *Ecography* 2022 (12), e06272 <https://doi.org/10.1111/ecog.06272>
- Esquivel, K.E.†, Hesselbarth, M.H.K.†, Allgeier, J.E. (2022). Mechanistic support for increased primary production around artificial reefs. *Ecological Applications* 32 (6), e2617. <https://doi.org/10.1002/eap.2617>
- Hesselbarth, M.H.K. (2021). shar: An R package to analyze species-habitat associations using point pattern analysis. *Journal of Open Source Software* 6 (68), 3811. <https://doi.org/10.21105/joss.03811>
- Hesselbarth, M.H.K., Nowosad, J., Signer, J., Graham, L.J. (2021). Open-source tools in R for landscape ecology. *Current Landscape Ecology Reports* 6 (3), 97–111. <https://doi.org/10.1007/s40823-021-00067-y>
- Borthwick, R.†, de Flamingh, A.†, Hesselbarth, M.H.K.†, Parandhaman, A.†, Wagner, H.H., Abdel Moniem, H.E.M. (2020). Alternative Quantifications of Landscape Complementarity to Model Gene Flow in Banded Longhorn Beetles [*Typocerus v. velutinus* (Olivier)]. *Frontiers in Genetics* 11, 307. <https://doi.org/10.3389/fgene.2020.00307>

Hesselbarth, M.H.K. (2020). *Analysing and modelling spatial patterns to infer the influence of environmental heterogeneity using point pattern analysis, individual-based simulation modelling and landscape metrics* (Dissertation). University of Goettingen, Goettingen, Germany. <http://dx.doi.org/10.53846/goediss-7959>

Hesselbarth, M.H.K., Sciaini, M., With, K.A., Wiegand, K., Nowosad, J. (2019). *landscapemetrics: An open-source R tool to calculate landscape metrics*. *Ecography* 42 (10), 1648-1657. <https://doi.org/10.1111/ecog.04617>

Hesselbarth, M.H.K., Wiegand, K., Dreber, N., Kellner, K., Esser, D., Tsvuura, Z. (2018). *Density-dependent spatial patterning of woody plants differs between a semi-arid and a mesic savanna in South Africa*. *Journal of Arid Environments* 157, 103-112. <https://doi.org/10.1016/j.jaridenv.2018.06.002>

Presentations

Hesselbarth, M.H.K., Jung, M., Visconti, P. (2023). *Evaluating the impact of European forest management on forest-related species using iSDMs*. 52nd Annual Meeting of the Ecological Society of Germany, Austria and Switzerland. Leipzig (Germany).

Hesselbarth, M.H.K., Jung, M., Visconti, P. (2023). *Biodiversity indicators and species distribution modeling*. ForestNavigator stakeholder workshop. International Institute for Applied Systems Analysis. Laxenburg (Austria).

Hesselbarth, M.H.K., Munsterman, K.S. (2022). *Advanced R Workshop*. Ecology and Evolutionary Biology Department, University of Michigan. Ann Arbor (USA). Workshop.

Hesselbarth, M.H.K. (2022). *Artificial reefs to promote primary production in tropical seagrass ecosystems: A simulation study using individual-based modelling*. Ecology and Evolutionary Biology Department Seminar, University of Michigan. Ann Arbor (USA). Talk.

Hesselbarth, M.H.K. (2022). *Introduction to R Workshop*. Ecology and Evolutionary Biology Department, University of Michigan. Ann Arbor (USA). Workshop.

Hesselbarth, M.H.K. (2021). *Spatial patterns in ecology and what we (hopefully) can learn from them*. Ecology and Evolutionary Biology Department Seminar, University of Michigan. Ann Arbor (USA). Talk.

Nowosad, J., Hesselbarth, M.H.K. (2020). *Introduction to landscape ecology with R*. Annual Meeting International Association of Landscape Ecology North America. Toronto (Canada). Workshop.

Hesselbarth, M.H.K., Sciaini, M., Nowosad, J., Hanss, S. (2019). *landscapemetrics: Introducing a new R tool to characterize landscapes*. 10th World Congress International Association of Landscape Ecology. Milano (Italy). Conference poster.

Hesselbarth, M.H.K., Wiegand, K. (2018). *A simulation study comparing methods to analyze species-habitat associations of forest trees*. 48th Annual Meeting of the Ecological Society of Germany, Austria and Switzerland. Vienna (Austria). Conference poster.

Software

arrR Simulating artificial reefs in R

[Link to homepage](#)

landscapemetrics Landscape Metrics for Categorical Map Patterns.

[Link to homepage](#)

shar Species-Habitat Associations.

[Link to homepage](#)

onpoint Helper Functions related to Point Pattern Analysis.

[Link to homepage](#)

Peer reviewer for scientific journals

Ecological Indicators; Global Ecology and Biogeography; Journal of Animal Ecology; Journal of Open Source Software; Journal of Tropical Ecology; Journal of Vegetation Science; Landscape Ecology; Methods in Ecology and Evolution; PeerJ; Perspective in Plant Ecology, Evolution and Systematics; Plant and Soil; Plant Ecology; PLOS One; Restoration Ecology; Scientific Reports; Synthesis Centre for Biodiversity Sciences; Web Ecology

Skills

Languages: German (native), English (fluent)

R: ●●●●●

C++: ●●●●○

NetLogo: ●●●●○

html, CSS: ●●●●○

SQL/SQLite: ●●●●○

LaTeX: ●●●●○

git: ●●●●○

QGIS: ●●●●○