Sebastián Block

sebastian.block@heigit.org | blockecology.github.io | +49 157 5850 1216

Professional experience

Jul 2024 – Present
Senior Spatial Data Scientist for Climate Action
Heidelberg Institute for Geoinformation Technology, Germany
Harnessed public datasets to develop indicators quantifying countries' performance on diverse environmental issues, from deforestation to chemical pollution and greenhouse gas emissions, and used them to guide policy priorities and sustainability investments around the world.

Sep 2022 – Aug 2024
Research Director, Environmental Performance Index
Yale Center for Environmental Law and Policy, USA
Harnessed public datasets to develop indicators quantifying countries' performance on diverse environmental issues, from deforestation to chemical pollution and greenhouse gas emissions, and used them to guide policy priorities and sustainability investments around the world.

Sep 2015 – Feb 2016
Research Associate
University of Adelaide, Australia
Compiled global database of fossil records to study the range shifts, extinctions, and community dynamics of the Late Pleistocene, and their implications for modern conservation science.

Education

Apr 2016 – Apr 2022
Ph.D. in Ecology and Evolution
Princeton University, USA (September 2019 - April 2022)
ETH Zürich, Switzerland (April 2016 - August 2019)
Advisor: Jonathan Levine

Aug 2013 – Aug 2015
M.Sc. in Applied Ecology, graduated with distinction
Erasmus Mundus International Program
University of Poitiers, France — Aug 2013 to Mar 2014
University of Coimbra, Portugal — Mar 2014 to Jul 2014
University of Kiel, Germany — Oct 2014 to Mar 2015
Master thesis co-advised by Corey Bradshaw, Ingmar Unkel, and Frederik Saltré at the University of Adelaide, Australia.

Aug 2007 – Nov 2011
B.Sc. in Biology, graduated with honors
Faculty of Sciences, National Autonomous University of Mexico, Mexico City, Mexico
Advisor: Jorge A. Meave

Publications

Peer-reviewed academic papers (Google Scholar profile)

Billur Bektaş, Chelsea Chisholm, Dagmar Egelkraut, Joshua Lynn, Sebastián Block, *et al.* 2024. Colonization and extinction lags drive non-linear responses to warming in mountain plant communities across the Northern Hemisphere. *Ecography* e07378.
DOI: 10.1111/ecog.07378

Saltré F., Chadœuf J., Higham T., Ochocki M., Block S., Bunney E., Llamas B. and Bradshaw C.J.A. 2024. Environmental conditions associated with initial northern expansion of anatomically modern humans. *Nature Communications* 15: 4364.
DOI: 10.1038/s41467-024-48762-8

Visakorpi K., Block S., Pellissier L., Levine J.M. and Alexander J.M. Eco-physiological and morphological traits explain alpine plant species' response to warming. *Functional Ecology* 37: 287–301.
DOI: 10.1111/1365-2435.14228

Block S., Maechler M-.J., Alexander J.M., Pellissier L. and Levine J.M. 2022. Ecological lags govern the pace and outcome of plant community responses to 21st-century climate change. *Ecology Letters* 25: 2156–2166.
DOI: 10.1111/ele.14087

Walker T.W.N., Gavazov K., Guillaume T., Lambert T., Mariotte P., Routh D., Signarbieux C., Block S., Münkemüller T., Nomoto H., Crowther T.W., Richter A., Buttler A., Alexander J.M. 2022. Lowland plant arrival in alpine ecosystems facilitates a decrease in soil carbon content under experimental climate warming. *Elife* 11: e78555.
DOI: 10.7554/eLife.78555

Block S. and Levine J.M. 2021. How dispersal evolution and local adaptation affect the range dynamics of species lagging behind climate change. *The American Naturalist* 197: E173-E187.
DOI: 10.1086/714130

Block S., Alexander J.M., and Levine J.M. 2020. Phenological plasticity is a poor predictor of subalpine plant population performance following experimental climate change. *Oikos* 129: 184–193.
DOI: 10.1111/oik.06667

Block S. and Meave J.A. 2017. Landscape-scale effects of geomorphological heterogeneity on variability of oak forest structure and composition in a monogenetic volcanic field. *Plant Ecology and Diversity* 10: 167–174.
DOI: 10.1080/17550874.2017.1330367

Block S., González E.J., Gallardo-Cruz A., Fernández A., Solórzano J.V., and Meave J.A. 2016. Using Google Earth Surface Metrics to Predict Plant Species Richness in a Complex Landscape. *Remote Sensing* 8(10):865.
DOI:10.3390/rs8100865

Block S., Saltré F. Rodríguez-Rey M., Fordham D.A., Unkel I., and Bradshaw C.J.A. 2016. Where to Dig for Fossils: Combining Climate Envelope, Taphonomy and Discovery Models. *PLoS ONE* 11(3):e0151090.
DOI:10.1371/journal.pone.0151090

Block S. and Meave J.A. 2015. Structure and diversity of oak forests in the El Tepozteco National Park (Morelos, Mexico). *Botanical Sciences* 93(3): 1–32.
DOI:10.17129/botsci.150

Reports

Block S., Emerson J.W., Esty D.C., de Sherbinin A., Wendling Z.A., *et al.* 2024. *2024 Environmental Performance Index.* New Haven, CT: Yale Center for Environmental Law & Policy. epi.yale.edu

Presentations

Invited talks

Block S. 2024. Forest fires, air pollution, climate change, and Canada's environmental performance. MacMillan Center Committee on Canadian Studies, Yale University, New Haven, USA. Watch here.

Block S. 2023. Spatial indicators in the Environmental Performance Index. Heidelberg Institute for Geoinformation Technology, Heidelberg, Germany.

Block S. 2023. Lags in plant community responses to climate change. Marine Ecology Seminar, GEOMAR, Kiel, Germany.

Block S. 2023. Climate performance in the EU according to the 2022 Environmental Performance Index. Workshop on the role of the EU budget in international climate finance, European Parliament, Brussels, Belgium.

Block S. 2023. Climate Change and Air Quality Indicators in the Environmental Performance Index. Oman Sustainability Conference on Air Quality and Climate Change, Muscat, Oman.

Contributed conference talks

Block S. 2024. Implications of human land cover change in protected areas for the 30x30 target. World Biodiversity Forum, Davos, Switzerland.

Block S. and Levine J.M. 2020. Accelerated migration of species lagging climate change. Nordic Society Oikos Meeting, Reykjavík, Iceland.

Block S. and Levine J.M. 2018. Population spread acceleration due to migration lags during climate change-driven range shifts. Ecological Society of Germany, Austria and Switzerland, Vienna, Austria.

Block S., Levine J.M. and Alexander J. 2017. Phenological plasticity is a poor predictor of alpine species responses to climate change. POPBIO 2017, Halle / Salle, Germany.

Contributed conference posters

Block S., Ulrich V., Martin M., von Elverfeldt K., von Buenau K.M., Haas P., Maiwald R., Butz A., Vardag S.N. 2025. A scalable approach to high-resolution, bottom-up GHG emission inventories using open data. EGU 2025 Annual Meeting, Vienna, Austria.

Block S., Ulrich V., Martin M., von Elverfeldt K., von Buenau K.M., Haas P., Maiwald R., Butz A., Vardag S.N. 2025. Scalable, high-resolution, bottom-up GHG emission inventories based on open data. IG3IS/ICOS Urban Greenhouse Gas Conference and Stakeholder Summit, Geneva, Switzerland.

Block S., Levine J.M. and Alexander J. 2017. Phenological plasticity is unrelated to alpine species responses to warming. BES, GfÖ, NecoV, and EEF Joint Annual Meeting, Ghent, Belgium.

Block S. and Meave J.A. 2013. Geomorphological heterogeneity is a major driver of oak forest diversity in a complex volcanic landscape. INTECOL-BES-2013 Joint Meeting, London, United Kingdom.

Block S. and Meave J.A. 2013. How Does Geomorphological Heterogeneity Affect Structure and Beta-Diversity of the Tropical Montane Oak Forests of the El Tepozteco National Park (Morelos State), Mexico? ATBC-OTS-2013 Joint Meeting, San José, Costa Rica.

Block S. and Meave J.A. 2013. Estructura y diversidad de los encinares del Parque Nacional El Tepozteco (México). XIX Congreso Mexicano de Botánica (XIX Mexican Congress of Botany), Tuxtla Gutiérrez, Chiapas, Mexico.

Block S. and Meave J.A. 2013. Heterogeneidad florística de los encinares del Parque Nacional El Tepozteco (Morelos, México). IV Congreso Mexicano de Ecología (IV Mexican Congress of Ecology), Villahermosa, Tabasco, México.

Awards

2021. 1st Place Princeton University Graduate Student Consulting Club Case Competition Fall/Winter.

2020. Best Student Oral Presentation Award. Oikos2020. 4th Conference of the Nordic Society Oikos

2017. Best Oral Presentation Award. POPBIO2017. 30th Conference of the Plant Population Biology Section of the Ecological Society of Germany, Austria and Switzerland (GfÖ)

2016. 1st Prize Modelling Complex Ecological Dynamics Award (BSc/MSc Category)

2014-2015. University of Coimbra Academic Achievement Award

2013-2015. Erasmus Mundus Category A Scholarship

2010-2011. National Autonomous University of Mexico Academic Achievement Recognition

2011. National Autonomous University of Mexico International Mobility Scholarship

Teaching

Workshops for the public sector

Data-driven composite indicators to assess national environmental performance (Spring 2025, Environment Authority, Oman)

Led a three-day workshop covering the basic steps in the construction of composite indicators to assess environmental performance across multiple domains, including data selection, normalization, and aggregation.

University courses

Agriculture, Human Diets and the Environment (Spring 2021, Princeton University)

Guided discussions based on course readings and designed exam questions.

Life on Earth: Chaos and Clockwork in Nature (Fall 2019, Princeton University)

Taught lab sections of introductory ecology and evolution course.

Quantitative Approaches to Plant Population and Community Ecology (Spring 2018 & 2019, ETH Zürich)

Organized and taught two-week module on analysis of community data.

Fundamental Questions in Environmental Sciences (Spring 2017, ETH Zürich)

Mentored bachelor students in writing essays about fundamental questions in ecology and evolution.

Quantitative Approaches to Plant Population and Community Ecology (Spring 2017, ETH Zürich)

Assisted in a two-week module on using experiments to parameterize models of interspecific competition.

Environmental Biology Seminars (Fall 2016, 2017, 2018; ETH Zürich)

Mentored students reviewing the scientific literature and preparing presentations about climate change effects on plant communities and about the causes of the Late Pleistocene megafauna extinctions.

Summer School on Alpine Plant Ecology (Summer 2018, Zürich-Basel Plant Science Center)

Co-mentored students analyzing data and preparing presentations about brief field research projects in Furka Pass, Swiss Central Alps.

Online courses

Coastal Ecology (Fall 2014, 2017, *Latin American Center for Environmental Education*; Fall 2016-2018, *México Sostenible*)

Designed and taught a three-week module on marine and coastal ecology in the online course "Integral Coastal Zone Management"

Student Mentoring & Community Outreach

Students mentored

Nina Huang – "Sensitivity analysis to weighting scheme and measurement error of 2022 EPI scores and rankings" (Senior thesis, Yale University)

Fabienne Spahn – "Different facets of climate change impose contrasting selection pressures on *Arabidopsis thaliana*" (MSc. thesis, ETH Zürich)

Camille Brioschi – "Using Landolt indicator values to predict alpine species responses to climate change" (MSc. thesis, ETH Zürich)

Popular science videos

Botany Lessons - a YouTube channel about plant systematics, ecology and evolution, in collaboration with fieldwork colleague Marc-Jacques Mächler.

TepozCosmos - a YouTube channel about the natural history of Tepoztlán, the town where I grew up in central Mexico (in Spanish).

Academic Community Service

Peer referee (Publons profile)

Journal of Ecology (×4)
Functional Ecology (×2)
Journal of Plant Ecology (×2)
Ecology Letters (×2)
Oikos
Science of the Total Environment
Palaeogeography, Palaeoclimatology, Palaeoecology
Plant Ecology & Diversity

Skills

Computer

Data visualization, analysis and modelling with R and Python

Spatial analysis with R, Python, and QGIS

Version control with Git and GitHub

Languages

Spanish (native)

English (full professional proficiency)

German (Level B1 in Common European Framework of Reference for Languages)

French (Level B1 in Common European Framework of Reference for Languages)