

HELENE H. WAGNER
Professor for Landscape Ecology

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EMPLOYMENT

Professor, Department of Biology, University of Toronto Mississauga	since 2019
Associate Professor, Department of Biology, University of Toronto Mississauga	2012 - 2019
Appointment, Graduate Department of Ecology and Evolutionary Biology, University of Toronto	since 2007
Assistant Professor, Department of Biology, University of Toronto Mississauga	2007 - 2012
Senior Scientist: Swiss Federal Research Institute WSL Birmensdorf, Switzerland	2006
Research Scientist: Swiss Federal Research Institute WSL, Birmensdorf, Switzerland	2001 - 2005
Postdoctoral Fellow: Colorado State University, Fort Collins, CO, USA	1999 - 2002

DEGREES & QUALIFICATIONS

Level 7 Diploma in Executive Coaching and Mentoring, Institute of Leadership and Management (ILM)	2017
Habilitation, Environmental Sciences, Swiss Federal Institute of Technology (ETH Zurich)	2005
Ph.D. in Environmental Sciences, Swiss Federal Institute of Technology (ETH Zurich)	1999
M.Sc. in Statistics, University of Neuchatel, Switzerland	1996
Diploma (M.Sc. equivalent) in Geography, University of Zurich	1994

RESEARCH INTERESTS

Global change threatens biodiversity and ecosystem services through the combined effects of human landscape alteration, climate change and biological invasions. My main research interest lies in understanding how human landscape alteration affects biodiversity patterns and processes. Ecological theories relating to biodiversity rely on assumptions on equilibrium conditions and dispersal that are often unrealistic in spatially heterogeneous and changing human-altered landscapes. To determine how landscape affects biodiversity and derive implications for conservation and natural resource management, the research in my lab falls into three broad topics that are complementary to each other: spatial ecology, metacommunity dynamics, and landscape genetics. Depending on the research question, I combine approaches of field experiments, surveys of natural populations and communities, and computer simulation, using a broad range of methods including spatial and multivariate statistics, GIS, molecular genetics, and spatio-temporal dynamic modeling.

SELECTED PUBLICATIONS (peer reviewed articles: total = 60; Google Scholar h-index = 42)

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- R packages: LandGenCourse (author), adespatial (co-author), vegan (co-author)
- Marrec, R., H.E. Abdel Moniem, M. Iravani, B. Hricko, J. Kariyeva and H.H. Wagner (2020). Conceptual framework and uncertainty analysis for large-scale, species-agnostic modelling of landscape connectivity across Alberta, Canada. *Scientific Reports* 10: 6798, doi: 10.1038/s41598-020-63545-z
- Torres-Vanegas, F., A.S. Hadley, U.G. Kormann, F.A. Jones, M.G. Betts and H.H. Wagner (2019). The landscape genetic signature of pollination by trapliners: Evidence from the tropical herb, *Heliconia tortuosa*. *Frontiers in Genetics* 10: 1206, doi: 10.3389/fgene.2019.01206.
- DiLeo, M.F., R. Holderegger and H.H. Wagner (2018). Contemporary pollen flow as a multiscale process: evidence from the insect-pollinated herb, *Pulsatilla vulgaris*. *J Ecology* 106: 2242-2255.
- Wagner, H.H. and S. Dray (2015). Generating spatially constrained null models for irregularly spaced data using Moran spectral randomization methods. *Methods Ecol Evol* 6: 1169-1178.
- Wagner, H.H. and M.J. Fortin (2013). A conceptual framework for the spatial analysis of landscape genetic data. *Conservation Genetics* 14: 253-261.
- Wagner, H.H., et al. (2013). Process-based long-term evaluation of an ecological network of calcareous grasslands connected by sheep herding. *Ecography* 36: 374-382.
- Wagner H.H. and M.J. Fortin (2005). Spatial analysis of landscapes: concepts and statistics. *Ecology* 86: 1975-1987.
- Wagner, H.H. (2003). Spatial covariance in plant communities: an integration of ordination, variogram modeling, and the variance test of species richness. *Ecology* 84: 1045-1057.