




François Leroy



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Keywords: *Macroecology, Machine Learning, Numerical Ecology, Modeling*

Experience

- 2024–2026  **Post Doc position in Macroecology - Understanding macroecological changes using Deep Learning, Ohio State University**, dept. of Evolution, Ecology and Organismal Biology, Columbus Ohio.
◦ Supervised by [Dr. Marta Jarzyna](#)
- 2020–2024  **PhD. in Macroecology - Spatial scaling and decomposition of macroecological changes, Faculty of Environmental Sciences, CZU**, dept. of [Spatial sciences](#), Prague.
◦ Supervised by [Dr. Petr Keil](#)
◦ Available [here](#)
- 2018–2020  **Marine Sciences MSc, Sorbonne University**, Paris (France, graduated September 2020).
Numerical Ecology, modelling, geostatistics, GIS, oceanography, marine ecology, biogeochemistry, database management
- 2017–2018 **3rd year of Bachelor of Science, South Brittany University**, Vannes (France).
Specialized in Coastal Ecosystems and Management, GIS
- 2015–2017 **1st and 2nd year of Bachelor of Science, Rouen Normandy University**, Rouen (France).
Specialized in Botanic

Internships

- 2020 (6 months)  **Community modelling, DYNECO-LEBCO, IFREMER**, Brest (France).
◦ **Objective:** develop a simulation tool to assess dynamic communities accompanying biogenic reefs built by *Sabellaria alveolata* (Linnaeus, 1767)(honeycomb worm)
◦ Explore the community topology using qualitative modelling
◦ Infer a Dynamic Bayesian Network (BN) from a large database ([REEHAB project](#))
- 2019 (2 months)  **Numerical ecology study, UMR BOREA - MNHN - LOCEAN**, Paris (France).
◦ **Objective:** spatiotemporal recruitment variability of *Sicyopterus lagocephalus* (Pallas 1770)(Teleostei : Gobiidae : Sicydiinae), amphidromous species of the Indian Ocean
◦ Pelagic Larval Duration (PLD) determination by otolithometry
◦ Statistical analysis to observe spatial (rivers) and temporal (season/year) differences of those PLD
◦ Larval dispersion modelling using the Ichthyop lagrangian model in backward to assess larval provenance
- 2018 (2 months) **Ecological study, Géoarchitecture Laboratory**, Vannes (France).
◦ **Objective:** use the opportunistic feature of the European shag to assess fish biodiversity
◦ Rejection pellets dissection and harvesting
◦ Fish identification using otoliths, data analysis
- 2017 (5 months) **Mapping, Photogrammetry, Géosciences Océans Laboratory**, Vannes (France).
◦ **Objective:** study the coastal dynamic of a beach in order to distribute sediment at the most relevant place
◦ Three dimensional modelling of a beach to observe its evolution
◦ Production of DEM (*i.e.* Digital Elevation Model) to exploit in GIS software

Other experiences

- 2024 (1 semester) **Deep Learning, Faculty of Mathematics and Physics, Charles University**, Prague.
◦ [Material](#)
- 2023 (1 week) **TheoMoDiv workshop, CESAB**, Montpellier.
◦ Training in theory-based approaches to model ecological data (time series, macroecology, interaction, trophic network)
- 2022 (1 months) **Visiting Ohio State University, Jarzyna lab**, Columbus, Ohio.
◦ Collaborating with Dr. Marta Jarzyna on the spatial scaling of abundance-based biodiversity trends
- 2022 (1 week) **HMSC course, Jyväskylä summer school**, Jyväskylä, Finland.
◦ Summer school on Hierarchy Modeling of Species Community


2021 **Machine Learning with R**, *Faculty of Mathematics and Physics*, Charles University, Prague.
(1 semester)

- Going through all Machine Learning algorithms, from Support Vector Machines to Neural Networks

Computer skills

Advanced , , , , \LaTeX
Intermediate , 
Basic , , , , 

Teaching

2022/2023 Spatial Ecology and Macroecology ([Github repository](#))
2023/2024 Seminar on reproducible science using Git and Github ([Github repository](#))
2022 Teaching assistant in spatial ecology and macroecology ([Github repository](#))
2021 Teaching assistant in GIS using ArcGIS 

Talks and conferences

Conference **Acceleration and demographic rates of bird abundance decline in North America**, *GfO macro*, Marburg, Germany, [Slides](#).
2024-06-14
Invited speaker **Introduction to Reproducible Science: Version Control using Git and Github**, *Ecoinformatics IAVS*, Online, [Slides](#).
2024-02-16
Conference **Acceleration and demographic rates of bird decline in North America**, *International Biogeography Society*, Prague, [Poster](#).
2024-01-07
Conference **Decomposing abundance change to recruitment and loss: analysis of the North-American avifauna**, *Ecological Society of America*, Portland, OR, [Slides](#).
2023-08-10
Conference **Untangling biodiversity changes across a continuum of spatial scales**, *International Biogeography Society conference*, Vancouver, BC, [Slides](#).
2022-06-05
Conference **Modeling biodiversity changes across a continuum of spatial scales**, *International Biogeography Society conference (Early career)*, Online, [Slides](#).
2021-10-23
Conference **Spatio-temporal scaling of biodiversity trends**, *GfÖ Virtual Annual Meeting*, Online, [Slides](#).
2021-09-01
Seminar **Introduction to Reproducible Science: Version Control using Git**, *CZU*, Prague, [Slides](#).
2020-07-01

Publications

Petr Keil, Adam T. Clark, Vojtěch Barták, and François Leroy. Should regional species loss be faster, or slower, than local loss? it depends on density-dependent rate of death. URL: <http://biorxiv.org/lookup/doi/10.1101/2024.04.05.588218>, doi:10.1101/2024.04.05.588218.

François Leroy. *Spatial scaling and decomposition of macroecological changes [online]*. Doctoral theses, dissertations, Czech University of Life Sciences Prague, Faculty of Environmental Sciences Praha, 2024 [cit. 2024-11-13]. SUPERVISOR: Mgr. Petr Keil, Ph.D. URL: <https://theses.cz/id/aigse5/>.

François Leroy, Marta Jarzyna, and Petr Keil. Acceleration and demographic rates behind bird decline in north america. URL: <https://ecoevorxiv.org/repository/view/6921/>, doi:10.32942/X21032.

François Leroy, Jiří Reif, David Storch, and Petr Keil. How has bird biodiversity changed over time? a review across spatio-temporal scales. 69:26–38. URL: <https://www.sciencedirect.com/science/article/pii/S1439179123000117>, doi:10.1016/j.baae.2023.03.004.

François Leroy, Jiří Reif, Zdeněk Vermouzek, Karel Štastný, Eva Trávníčková, Vladimír Bejček, Ivan Mikuláš, and Petr Keil. Decomposing biodiversity change to processes of extinction, colonization, and recurrence across scales. page e06995. URL: <https://onlinelibrary.wiley.com/doi/10.1111/ecog.06995>, doi:10.1111/ecog.06995.

Vítězslav Moudrý, Kateřina Gdulová, Lukáš Gábor, Eliška Šárovcová, Vojtěch Barták, François Leroy, Olga Špatenková, Duccio Rocchini, and Jiří Prošek. Effects of environmental conditions on ICESat-2 terrain and

canopy heights retrievals in central european mountains. 279:113112. URL: <https://www.sciencedirect.com/science/article/pii/S0034425722002267>, doi:10.1016/j.rse.2022.113112.

Vítězslav Moudrý, Petr Keil, Anna F Cord, Lukáš Gábor, Vincent Lecours, Alejandra Zarzo-Arias, Vojtěch Barták, Marco Malavasi, Duccio Rocchini, Michele Torresani, Kateřina Gdulová, Florencia Grattarola, François Leroy, Elisa Marchetto, Elisa Thouverai, Jiří Prošek, Jan Wild, and Petra Šímová. Scale mismatches between predictor and response variables in species distribution modelling: A review of practices for appropriate grain selection. page 03091333231156362. Publisher: SAGE Publications Ltd. doi:10.1177/03091333231156362.

Dominika Prajzlerová, Vojtěch Barták, Petr Keil, Vítězslav Moudrý, Markéta Zikmundová, Petr Balej, François Leroy, Duccio Rocchini, Michela Perrone, Marco Malavasi, and Petra Šímová. The relationship between remotely-sensed spectral heterogeneity and bird diversity is modulated by landscape type. 128:103763. URL: <https://linkinghub.elsevier.com/retrieve/pii/S1569843224001171>, doi:10.1016/j.jag.2024.103763.

Scientific Referees

Dr. **Petr Keil**, Czech University of Life Sciences, ☎+420 224382659, keil@fzp.czu.cz

Dr. **Martin Marzloff**, Ifremer, ☎+332 98224327, Martin.Marzloff@ifremer.fr

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