François Leroy

10 Rue des Préaux, Saint-Marcel
27950, Normandy, France
+420737480623
leroy@fzp.czu.cz
https://frslry.github.io/

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 recruitement 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**, *Géoarchitecure 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*, Colombus, 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 Hirearchical Modeling of Species Community

2021 (1 semester) **Machine Learning with R**, *Faculty of Mathematics and Physics*, Charles University, Prague.
- Going through all Machine Learning algorithms, from Support Vector Machines to Neural Networks

Computer skills

Advanced R, Git, QGIS, ArcGIS, LaTeX

Intermediate Python, MySQL

Basic Julia, Shell, MATLAB, HTML5, CSS

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 2024-06-14 **Acceleration and demographic rates of bird abundance decline in North America**, *GfO macro*, Marburg, Germany, Slides.

Invited speaker 2024-02-16 **Introduction to Reproducible Science: Version Control using Git and Github**, *Ecoinformatics IAVS*, Online, Slides.

Conference 2024-01-07 **Acceleration and demographic rates of bird decline in North America**, *International Biogeography Society*, Prague, Poster.

Conference 2023-08-10 **Decomposing abundance change to recruitment and loss: analysis of the North-American avifauna**, *Ecological Society of America*, Portland, OR, Slides.

Conference 2022-06-05 **Untangling biodiversity changes across a continuum of spatial scales**, *International Biogeography Society conference*, Vancouver, BC, Slides.

Conference 2021-10-23 **Modeling biodiversity changes across a continuum of spatial scales**, *International Biogeography Society conference (Early career)*, Online, Slides.

Conference 2021-09-01 **Spatio-temporal scaling of biodiversity trends**, *GfÖ Virtual Annual Meeting*, Online, Slides.

Seminar 2020-07-01 **Introduction to Reproducible Science: Version Control using Git**, *CZU*, Prague, Slides.

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.

Francois Leroy. *Spatial scaling and decomposition of macroecological changes [online]*. Doctoral theses, dissertations, Czech University of Life Sciences Prague, Faculty of Environmental SciencesPraha, 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, Jiři 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 Šťastný, 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, Francois 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 Sicences, ☎+420 224382659, keil@fzp.czu.cz

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

Dr. **Vítězslav Moudrý**, Czech University of Life Sicences, ☎+420 224382653, moudry@fzp.czu.cz

Dr. **Florencia Grattarola**, Czech University of Life Sicences, ☎+420 774975962, grattarola@fzp.czu.cz