

Ghislain Vieilledent

Ecology – Applied Statistics

Cirad, UMR AMAP
F-34398 Montpellier, France
☎ +33.(0)4.67.61.49.24
✉ ghislain.vieilledent@cirad.fr
📧 ecology.ghislainv.fr



Positions

- 2009 – pres. **Research scientist**, Cirad, UMR AMAP, Montpellier (France), Ecology and applied statistics.
- 2015 – 2018 **Seconded National Expert (SNE)**, European Commission, Joint Research Center, Ispra (Italie), Modelling and forecasting anthropogenic deforestation in the tropics.
- 2009 – 2012 **Detached researcher in Madagascar**, Cirad, dP Forêts et Biodiversité, Antananarivo (Madagascar), Functioning and conservation of tropical forest ecosystems in Madagascar.

Research topics

- Main topics** **Community ecology**: competition between species, intraspecific variability, and demography of rare species; **Conservation biology**: role of tropical forests in the global carbon cycle and species vulnerability to land-use and climate change; **Statistics applied to ecology**: advanced statistical models for modelling species distribution and tropical anthropogenic deforestation.
- Land-use change modelling** During my stay at the Joint Research Center of the European Commission as a Seconded National Expert (2015–2018), I have developed a methodology and new statistical and informatic tools to model and forecast deforestation at the pantropical scale.

Background and diploma

- 2009 **Cemagref de Grenoble, AgroParisTech**. *PhD thesis* in statistics applied to forest ecology. Tree species coexistence mechanisms in mixed mountain forests (Norway Spruce and silver Fir).
- 2004 **Ecole Nationale Supérieure Agronomique de Rennes (ENSAR)**. *Diploma of Agronomy*. Agronomy, quantitative ecology and conservation biology.

Funded research projects

- 2020 – 2023 **METRADICA** project (co-PI), Mechanistic traits to predict shifts in tree species abundance and distribution with climate change in the Amazonian forest, **Labex CEBA**, 200 000 €, <http://www.labex-ceba.fr/projets-strategiques>
- 2020 – 2022 **INTRACO** project (PI), Unravelling the role of intraspecific variability in tree species coexistence in tropical forest, **FRB-Cesab**, 4 international workshops, <https://frama.link/intraco>
- 2019 – 2022 **RELIQUES** project (in charge of WP1), Effect of forest fragmentation on biodiversity in ultramafic forests of New-Caledonia, **CNRT**, 251 380 €, <https://cnrt.nc/reliques>
- 2014 – 2019 **BioSceneMada** project (coordinator), Biodiversity scenario under the effects of both climate change and deforestation in Madagascar, **FRB-FFEM**, 116 748 €, <https://bioscenemada.cirad.fr>
- 2010 – 2012 **REDD+** projects, Contribution of Madagascar tropical forests to the global carbon cycle, **AFD**, **GoodPlanet**, **WWF**, 69 210 €

Software development

- Statistical R packages** **hSDM** and **jSDM** for advanced species distribution modelling. Contributions to **MCMCpack** for generalized linear mixed models (glmm).
- Python module** **forestatrisk** for modelling and forecasting deforestation in the tropics: <https://github.com/ghislainv/forestatrisk>

Scientific publications

Summary

Since 2009, 38 scientific articles and 3 book chapters, **H-index**: 25 (Google Scholar), 19 (Web of Science). Complete list at: <https://ecology.ghislainv.fr/publications>

Publications in link with the IPBES call

- [10] **Strona G., S. D. Stringer, G. Vieilledent, Z. Szantoi, J. Garcia-Ulloa and S. A. Wich.** 2018. Small room for compromise between oil palm cultivation and primate conservation in Africa. *Proceedings of the National Academy of Sciences PNAS*, 115(35):8811–8816. [doi: 10.1073/pnas.1804775115]
- [9] **Dezécache C., J.-M. Salles, G. Vieilledent, and B. Hérault.** 2017. Moving forward socio-economically focused models of deforestation. *Global Change Biology*, 23(9): 3484-3500. [doi: 10.1111/gcb.13611]
- [8] **Vieilledent G., O. Gardi, C. Grinand, C. Burren, M. Andriamanjato, C. Camara, C. J. Gardner, L. Glass, A. Rasolohery, H. Rakoto Ratsimba, V. Gond, and J.-R. Rakotoarijaona.** 2016. Bioclimatic envelope models predict a decrease in tropical forest carbon stocks with climate change in Madagascar. *Journal of Ecology*, 104:703–715. [doi: 10.1111/1365-2745.12548]
- [7] **Vieilledent G., C. Cornu, A. Cuní Sanchez, J.-M. Leong Pock-Tsy and P. Danthu** 2013. Vulnerability of baobab species to climate change and effectiveness of the protected area network in Madagascar: towards new conservation priorities. *Biological Conservation*, 166:11-22. [doi: 10.1016/j.biocon.2013.06.007]
- [6] **Vieilledent G., C. Grinand and R. Vaudry** 2013. Forecasting deforestation and carbon emissions in tropical developing countries facing demographic expansion: a case study in Madagascar. *Ecology and Evolution*, 3:1702-1716. [doi: 10.1002/ece3.550]

Other high impact publications

- [5] **Vancutsem C. and F. Achard and J.-F. Pekel and G. Vieilledent and S. Carboni and D. Simonetti and J. Gallego and L. Aragao and R. Nasi.** 2020. Long-term (1990-2019) monitoring of tropical moist forests dynamics. *bioRxiv*, 2020.09.17.295774. [doi: 10.1101/2020.09.17.295774]
- [4] **Vieilledent G., C. Grinand, F. A. Rakotomalala, R. Ranaivosoa, J.-R. Rakotoarijaona, T. F. Allnutt, and F. Achard.** 2018. Combining global tree cover loss data with historical national forest-cover maps to look at six decades of deforestation and forest fragmentation in Madagascar. *Biological Conservation*, 222: 189-197. [doi: 10.1016/j.biocon.2018.04.008]
- [3] **Kunstler G., D. Falster, D. Coomes, F. Hui, R. Kooyman, D. Laughlin, L. Poorter, M. Vanderwel, G. Vieilledent, S. J. Wright, M. Aiba, C. Baraloto, J. Caspersen, J. H. C. Cornelissen, S. Gourlet-Fleury, M. Hanewinkel, B. Hérault, J. Kattge, H. Kurokawa, Y. Onoda, J. Penuelas, H. Poorter, M. Uriarte, S. Richardson, P. Ruiz-Benito, I.-F. Sun, G. Ståhl, N. Swenson, J. Thompson, B. Westerlund, C. Wirth, M. Zavala, H. Zeng, J. Zimmerman, N. Zimmermann, and M. Westoby.** 2016. Plant functional traits have globally consistent effects on competition. *Nature*, 529:204–207. [doi: 10.1038/nature16476]
- [2] **Chave J., M. Réjou-Méchain, A. Búrquez, E. Chidumayo, M. S. Colgan, ..., and G. Vieilledent.** 2014. Improved allometric models to estimate the aboveground biomass of tropical trees. *Global Change Biology*, 20:3177–3190. [doi: 10.1111/gcb.12629]
- [1] **Kunstler G., S. Lavergne, B. Courbaud, W. Thuiller, G. Vieilledent, N. E. Zimmermann, J. Kattge and D. A. Coomes.** 2012. Competitive interactions between forest trees are driven by species' trait hierarchy, not phylogenetic or functional similarity: implications for forest community assembly. *Ecology Letters*, 15(8):831–840. [doi: 10.1111/j.1461-0248.2012.01803.x]