

Guillaume SALZET | PhD student in forest sciences

UMR 1443 Bureau d'Économie Théorique et Appliquée (BETA)

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Experiences

2020
2023

PhD in forest sciences, INRAE - UMR BETA, à l'UMR EcoFoG (Kourou)

Title : Sustainability of the forestry-wood industry in French Guiana
a spatialized approach using bioeconomic modeling

Research fields:

- estimation of forest ecosystem services (carbon, diversity, roundwood, hunting) ;
- Forest sector demand modeling (preference surveys, strategy elicitation) ;
- calibration by model substitution of forest dynamics (Gaussian process approach).

MSc project - UMR EcoFoG - Supervisor : Stéphane Traissac (IAE AgroParisTech)

2020/04
2020/09

MSc research project in tropical forest ecology (6 months), at UMR EcoFoG (telecommuting)

Subject : Study of demographic processes and spatial distribution of functional traits under environmental constraints in tropical forests.

Skills : independent work, demographic analysis, spatial point process, Bayesian inference.

Project AFFORBAL - UMR BETA - Supervisor : Sylvain Cauria (IR INRAE)

2020/02/
2020/04

Task officer/Chargé de mission (3 months), PNR des Ballons des Vosges, at UMR BETA (Nancy)

Task : Spatial analysis of industrial clusters in the French and their impact on the probability of cutting.

Skills : ecosystem service assessment, spatial Cox model, Bayesian inference.

Project ExtraForEst - UMR SILVA - Supervisor : Francis Colin (DR INRAE)

2020/01

Task officer/Ingénieur d'étude (1 month), UMR SILVA, at *Jacksonville & Athens (USA)*

Task : Building a scientific collaboration on the coupling of forestry and quality with an industrial (Rayonier) and academic partner (forestry department - *University of Georgia*).

Skills : international collaboration, communication in English, project design.

2019/07

Task officer/Assistant ingénieur (1 month), INRA - UMR SILVA (Champenoux)

Task : Coupling of a statistical model assembly with an individual-centered growth model of Douglas fir (*Pseudotsuga menziesii*).

Skills : package development, project management, writing specifications.

2019/02

2019/08

MSc research project in forest modelling (6 months), at UMR SILVA (Champenoux)

Subject : A Bayesian analysis and modeling of Douglas fir (*Pseudotsuga menziesii*) quality to predict the extractable resource.

Skills : uncertainty propagation, Bayesian inference by deep neural networks.

Project Glutathion-S-transferase - UMR IAM - Supervisor : Eric Gelhaye (DR INRAE)

2018/02
2018/06

MSc research project in chemical ecology (5 months), at UMR IAM (Nancy)

Subject : Study of protein-ligand interactions between Glutathione-S-transferases from *Trametes versicolor* and French Guiana wood extractives in relation to natural durability.

Skills : experimental design optimization, non-linear model, mixed model.

2016/11

2017/08

MSc research project in chemical ecology (10 months), SAYENS, at 'UMR IAM (Nancy)

Subject : Characterization of Guyanese wood extractives and their sustainable production.

Skills : feasibility study, prospective market analysis, methodological watch.

Education

2015
2020

AgroParisTech, MSc - Engineering degree in forest science and engineering, (Paris & Nancy)
One of France's leading schools in environmental sciences and engineering, to which entrance is based on a national competitive exam. An engineer degree is equivalent to an MSc.

2017
2020

École Normale Supérieure de Paris, Double MSc degree AgroParisTech - ENS, (Paris)
Top 1% French graduate school, **MSc** Interdisciplinary Master in Life Sciences, **Specialization**: Eco-Evo

2019
2020

Muséum national d'histoire naturelle, MSc in statistical ecology, (Paris)
Specialization: spatio-temporal analysis, structural modelling (static & dynamic), advanced bayesian.

2018
2019

AgroParisTech, MSc in tropical ecology, (Kourou)
Specialization: tropical forestry, diversity quantification, ecophysiology, bayesian modelling

2016
2018

Université de Lorraine, MSc in economy, (Nancy)
Specialization: econometrics, ecosystem services, environment & energy economics.

Professional training

2021

Managing and opening up research data, 8h - AgroParisTech (remote)

- General framework for research data - definition, legal and regulatory status, issues related to openness and confidentiality ;
- Issues and practices to be integrated into the research project process - data management plan, storage strategy, opening and publication

2021

Review of scientific and technical information, 21h - Univ. Guyane

- Open Science, research dissemination and open archives ;
- Brands, patents and labels ;
- Research assessment and bibliometrics ;
- Implement a document monitoring strategy.

2022

Singularity & Snakemake workflow lecture, 4h - UMR EcoFoG (internal training)

- Formalizing analysis protocols with Snakemake ;
- Containerization by Singularity ;
- Optimized scaling.

Skills

Languages French: Native | English: Fluent (C1) | Spanish: Conversational (B2)

Data sciences R, SAS, Matlab | Bayésien : Stan, Greta | Spatial : INLA, spdep | Optimisation : CVXR

Developpement Package : R, C++, Python, SQL | Web : PHP, HTML

FAIR Data management : Access, PostGreSQL, hdf | version control : Git, Github

principles Collect : certificate of consent, personal data management, statistical confidentiality
Reproductibility : Snakemake, Singularity

Diffusion Suite Office, Affinity, L^AT_EX, Markdown **Cartography** QGIS, GRASS, SAGA

Teaching & supervision

2021

Tropical forest training module 2021

Course (3h) on "Estimate, origins & theory on tropical tree diversity" ;

Supervision of student project (4 students, 2 weeks) : "Analysis of the upstream forestry sector in French Guiana - Mapping and value chain"

2022

Tropical forest training module 2022

Co-supervision of student project (8 students, 2 weeks) : "Study of the ecological and anthropic factors of the distribution of regeneration on plot 16 of Paracou"

2020
2021

MSc research project in forest management optimisation (6 months), Martin Estivals (Polytech Clermont), co-supervision ONF Guyane

Subject : Sustainability of exploitation of the permanent forest estate in French Guiana: Approach by modeling forest dynamics and cost-benefit analysis.

2021
2022

MSc research project in socioecosystem modelling (6 months), Cyrus Matboo (IMT Nord Europe), co-supervision OFB Guyane

Subject : Study of the dispersal patterns of hunters - Bioeconomic analysis of hunted wildlife populations on the French Guiana coast.

2021
2022

MSc research project in organisational sociology (6 months), Ambroise Yeboua (Univ. de Montpellier), co-supervision UMR BETA

Subject : Socio-economic modeling and sustainability of material flows in the forestry-wood sector in French Guiana.

Research projects

- ForHunt Logging** Interaction between hunting pressure and logging in northern French Guiana - a GPS tracking survey coupled with spatialized bioeconomic modeling (*UMR BETA, UMR EcoFoG & OFB*)
Tasks: design, coordination, budget management [**15k €**] - funded by the 2021 annual call of LabEx CEBA.
- TrollCalibR** Development of a large-scale experimentation and calibration tool for the TROLL forest growth model (*UMR BETA & UMR EcoFoG*)
Tasks: design, coordination, budget management [**10k €**] - funded by the thesis operating budget Guillaume Salzet.

Published articles

- [3] Muriel Barbier, Thomas Perrot, **Guillaume Salzet**, Nadine Amusant, Stéphane Dumarçay, Philippe Gérardin, Mélanie Morel-Rouhier, Rodnay Sormani, and Eric Gelhaye. "Glutathione Transferases: Surrogate Targets for Discovering Biologically Active Compounds". In: *Journal of Natural Products* 83.10 (Oct. 2020), pp. 2960–2966. DOI: 10.1021/acs.jnatprod.0c00480.
- [2] Thomas Perrot, **Guillaume Salzet**, Nadine Amusant, Jacques Beauchene, Philippe Gérardin, Stéphane Dumarçay, Rodnay Sormani, Mélanie Morel-Rouhier, and Eric Gelhaye. "A Reverse Chemical Ecology Approach to Explore Wood Natural Durability". In: *Microbial Biotechnology* 13.5 (Sept. 2020), pp. 1673–1677. ISSN: 1751-7915, 1751-7915. DOI: 10.1111/1751-7915.13540.
- [1] Thomas Perrot, Mathieu Schwartz, Fanny Saiag, **Guillaume Salzet**, Stéphane Dumarçay, Frédérique Favier, Philippe Gérardin, Jean-Michel Girardet, Rodnay Sormani, Mélanie Morel-Rouhier, Nadine Amusant, Claude Didierjean, and Eric Gelhaye. "Fungal Glutathione Transferases as Tools to Explore the Chemical Diversity of Amazonian Wood Extractives". In: *ACS Sustainable Chemistry & Engineering* 6.10 (Oct. 2018), pp. 13078–13085. ISSN: 2168-0485, 2168-0485. DOI: 10.1021/acssuschemeng.8b02636.

Working papers

- [3] Vincyane Badouard, Sylvain Schmitt, **Guillaume Salzet**, Thomas Gaquiere, and Geraldine Derroire. "LoggingLab: An R Package to Simulate Forest Logging". In Prep. 2023.
- [2] **Guillaume Salzet**, Méline Aubry-Kientz, Thomas Gaquiere, Marion Boisseaux, Stéphane Traissac, Eric Marcon, and Sylvain Schmitt. "Hydro-Edaphic Gradient Shapes the Inter and Intra Genus of Local Tree Community Assembly in Neotropical Forest". In Prep. 2023.
- [1] Sylvain Schmitt, **Guillaume Salzet**, Fabian Jörg Fischer, Isabelle Maréchaux, and Jérôme Chave. "Rcontroll: An R Interface for the Individual-Based Forest Dynamics Simulator TROLL". Submitted in *Methods Ecol. Evol.* 2023.

MSc thesis and technical reports

- [4] **Guillaume Salzet**. "Bayesian modeling of Douglas fir quality to predict the resource of extractable chemical". AgroParisTech, 2020, p. 126.
- [3] **Guillaume Salzet**. "Study of the processes demographic processes and distribution of functional traits to environmental constraints environmental constraints in tropical tropical forest". Paris, France: Muséum National d'Histoire Naturelle, 2020, p. 38.
- [2] **Guillaume Salzet** and Valentin Mathieu. "Spatial analysis of wood industrial clusters in the Vosges and their impact on the local forestry". Parc naturel régional du ballon des Vosges, 2019, p. 40.
- [1] **Guillaume Salzet**. "Protein-ligand interactions between Glutathione-S-transferases from *Trametes versicolor* and French Guiana wood extractives in relation to natural durability". Paris, France: Ecole Normale Supérieure de Paris, 2018.

Interests

Scientific outreach (school activities - primary and secondary schools - on the botanical trail in Kourou), Entrepreneurship (AgroParisTech Creativity Award), gardening, cooking, athletics.