

# Guillaume SALZET | PhD student in forest sciences

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

UMR 745 Écologie des Forêts de Guyane (EcoFoG)

3 Rue Claude Monet – 97310 Kourou – France

\* 25 May 1995 • +33 (0)6 07 02 26 59 • g.salzet@gmail.com

guillaume-salzet.netlify.app • gsaltzet • 0000-0003-4548-5673



## 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)**, à l'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 (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** : Establishment of a scientific collaboration on the coupling of forestry and quality with an industrial (Rayonier) and academic partner (département sylviculture - *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 forestry 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.

2017  
2020

**École Normale Supérieure de Paris**, Double MSc degree AgroParisTech - ENS, (Paris)  
*MSc Interdisciplinary Master in Life Sciences*

2019  
2020

**Muséum national d'histoire naturelle**, MSc in statistical ecology, (Paris)

2018  
2019

**AgroParisTech**, MSc in tropical ecology, (Kourou)

2016  
2018

**Université de Lorraine**, MSc in economy, (Nancy)

## 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<sup>A</sup>T<sub>E</sub>X, 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.

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## 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 forestry model(UMR BETA & UMR EcoFoG) **Task** : design, coordination, budget management [10k €] - financed by the thesis operating budget Guillaume Salzet.

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## 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.

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## 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**, Mélaine 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.

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## 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.

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## Interests

Scientific outreach (school activities - primary and secondary schools - on the botanical trail in Kourou), Entrepreneurship (AgroParisTech Creativity Award), gardening, cooking, athletics (8 years in Sprint - ranked Regional)