Sylvain Caurla

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# Degrees

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| **Habilitation à Diriger les Recherches**(Highest academic French Degree, required to supervise PhD students) | Lorraine University, *Economics*Thesis title: “Simulation models in economics to study the sustainability of the forestry and wood sector”Jury: Sophie Thoyer (Rap.), Jean-Denis Mathias (Rap.), Mériem Fournier, Thierry Brunelle, Olivier Damette (Pres.), Serge Garcia (Dir.) | Sept. 2020 |
| **PhD** | AgroParisTech, *Economics*Thesis title : “Bioeconomic modelling of the forest sector to assess the economic and environmental impacts of climate policies on the French forest-wood sector”Jury: Jean-Charles Hourcade (Rap.), Maarit Kallio (Rap.), Pierre-Alain Jayet (Pres.), Jean-François Dhôte, Franck Lecocq (Dir.) | Jan. 2012 |
| **MSc** | AgroParisTech, Ecole Polytechnique, Mines ParisTech, Ecole des Ponts ParisTech, ENSTA ParisTech, EHESS and Paris-X Nanterre, *Environmental Economics* | Oct. 2008 |
| **Engineering** **Degree** | AgroParisTech, *Forestry* | Oct. 2008 |

# Career

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| **National Research Institute for Agriculture, Food and Environment (INRAE)**Bureau D’Economie Théorique et Appliquée (BETA),Nancy, France | **Research Fellow** * Management of the forest sector modelling team (in May 2021: 4 permanent staff, 2 PhD): defining scientific strategy, fundraising, proposals writing, projects management, PhD supervision
* Research program on integrated simulation models to provide economic and environmental assessments for forest-wood bioeconomic systems
* In charge of the research program on forest bioeconomy at the Laboratory of Excellence for Advanced Research on the Biology of Tree and Forest Ecosystems (Labex ARBRE)
* In charge of the research program on territorial integration at the Laboratory of Excellence for the Management of Strategic Metals (Labex Ressources 21)
* Teaching (Carbon Economics, Environmental Economics)
 | SinceSept. 2012 |
| **Potsdam Institute for Climate Impact Research (PIK),** Potsdam, Germany | **Visiting Researcher*** Integrating forest sector into MAgPIE global land-use model
 | Sept. 2013 – Oct. 2014 |
| **AgroParisTech,** Laboratoire d’Economie Forestière (LEF),Nancy, France | **PhD Student*** Development and numerical implementation of the [French Forest Sector Model](https://ffsm-project.org/wiki/en/home) (website)
* Assessment of climate policies impacts on the forest sector
 | Oct. 2008 – Jan. 2012  |

# Other Responsabilities

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| **Programme for the Endorsement of Forest Certification (PEFC)** | **Scientific Expert*** Member of the consortium in charge of revising the sustainable forest management rules for France
 | Since 2021 |
| **INRAE Bioeconomy MetaProgram,** Paris, France | **Member of the coordination team*** Defining the institute strategy on urban bioeconomy
* Appraisal and selection of research projects and PhD positions to be funded by INRAE
 | Since 2020  |
| **Chair Energy & Prosperity,** Paris, France | **Research Associate*** Coupling economics with Life Cycle Assessment to assess impacts of wood biomass use for energy
 | Since 2020 |
| **INRAE Economics Department,** Paris, France | **Elected member, Scientific Board*** Defining the Department scientific strategy
* Allocation of thesis grants and research positions
 | Since 2016 |
| **Institute for Climate Economics (I4CE),** Paris, France | **Scientific expert*** Scientific watch and writing reviews on carbon economics and forest & wood economics for the Carbon Forest & Wood Club
 | Since 2013 |

# Coordination of Research Projects (building and management)

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| **STREISAND** | * Modelling direct and indirect carbon substitution by wood products through the coupling of economic models and Life Cycle Assessment
* 13 researchers, 2 PhD, 2 post-doc and 4 Masters involved
* Budget managed: 393 k€
* Funding bodies: ADEME (Public, France), GRDF (Private, France), INRAE (Public, France)
 | 2021-2024 |
| **ELLIOT**  | * Modelling the international wood trade at different scales
* 1 PhD and 1 Master involved
* Budget managed: 110 k€
* Funding bodies: region Grand-Est (Public, French region) & INRAE (Public, France)
 | 2020-2023 |
| **FFSM-Guyane** | * Developing an integrated and spatialized bioeconomic model to assess the sustainability of the forest sector in French Guiana
* 1 PhD and 2 Masters involved
* Budget managed: 115 k€
* Funding bodies: Lorraine University (Public, France) & INRAE (Public, France)
 | 2020-2023  |
| [**AFFORBALL**](https://afforball-psdr4.fr/)[**(website)**](https://afforball-psdr4.fr/) | * Exploring the adaptations of the forest sector to climate changes in the “Ballons des Vosges” Natural Park
* 15 researchers, 1 PhD, 5 Masters involved
* Budget Managed: 200 k€
* Funding bodies: region Grand-Est (Public, French region) & INRAE (Public, France)
 | 2016-2020 |

# Participation in Research Projects (in charge of a task or a work package)

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| **MOBINTER** | * Exploring the roles of individual and territorial characteristics in wood harvesting patterns in private forests
* Budget managed: 35 k€
* Coordination: Mihai Tivadar (INRAE, Grenoble, France)
* Funding body: ADEME (Public, France)
 | 2020-2023 |
| **BIO-SYLVE** | * Designing sustainable sylviculture to provide biomass for the bioeconomy sectors
* Budget managed: 29 k€
* Coordination: Denis Loustau (INRAE, Bordeaux, France)
* Funding body: ADEME (Public, France)
 | 2020-2023 |
| [**Des Hommes et Des Arbres**](https://www.deshommesetdesarbres.org/)[**(website)**](https://www.deshommesetdesarbres.org/) | * Exploring the role of trees in the regional economic development
* Budget managed: 115 k€
* Coordination: Métropole du Grand Nancy
* Funding bodies: more than 60 funding bodies (Public and Private)
 | 2020-2025  |
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| [**Gemm-Est**](https://www6.inrae.fr/extraforest/Le-projet-Gemm_Est) | * Understand the mechanisms of resin and resin acid overproduction in five tree species
* Budget managed: 5 k€
* Coordination: Francis Colin (INRAE, Nancy, France)
* Funding body: Lorraine University (Public, France)
 | 2019-2021 |
| [**ExtraForEst**](https://www6.inrae.fr/extraforest/Le-projet-ExtraFor_Est) | * Evaluate the quantity and quality of chemical compounds in 5 tree species in order to supply potential new markets and support the forest bioeconomy industry
* Budget Managed: 5 k€
* Coordination: Francis Colin (INRAE, Nancy, France)
* Funding bodies: FEDER (EU), ADEME, Ministry of Agriculture (Public, France), region Grand-Est (French region, Public)
 | 2017-2020 |
| **Hy-C-Green** | * Sustainable use of wood in integrated thermochemical biorefineries in the form of green energy, in particular decarbonated hydrogen
* Budget managed: 60 k€
* Coordination: Anthony Dufour (CNRS, Nancy, France)
* Funding bodies: FEDER (EU), Region Grand-Est (French region, Public)
 | 2017-2021 |
| [**MARCO**](https://marco-h2020.eu/)[**(website)**](https://marco-h2020.eu/) | * Provide insights into the climate services market in Europe
* Budget managed: 25 k€
* Coordination: Climate-KIC (Brussels, Belgium)
* Funding body: Horizon 2020 (EU)
 | 2016-2018 |
| [**AF Filières**](https://www.flux-biomasse.fr/)[**(website)**](https://www.flux-biomasse.fr/) | * Systematic analysis of the biomass flows at national and regional scales, the environmental pressures they generate, and the associated value chains and jobs
* Budget managed: 10 k€
* Coordination: Jean-Yves Courtonne (INRIA, Grenoble France)
* Funding body : ADEME (Public, France)
 | 2016-2019 |
| **ORACLE** | * Opportunities and risks of agrosystems & forests in response to climate, socio-economic and policy changes in France and Europe
* No budget managed
* Coordination: Nathalie de Noblet-Ducoudré (CNRS, Paris, France)
* Funding body : French Research Agency (Public, France)
 | 2012-2015 |

# Scientific Production

## Articles in peer-reviewed Journals

* Delacote, P., Lobianco, A., **Caurla, S.**, Bontemps, J-D., Lungarska, A., Mérian, P., Rivière, M., Barkaoui, A. (2021) The loop effect: how climate change impacts the mitigation potential of the French forest sector, **Journal of Forest Economics**, Forthcoming. DOI:[10.1561/112.00000522](http://dx.doi.org/10.1561/112.00000522)
* Rivière, M., Caurla, S. (2020) Landscape implications of managing forest for carbon sequestration, ***Forestry***, Forthcoming. DOI: [10.1093/forestry/cpaa015](https://doi.org/10.1093/forestry/cpaa015)
* Rivière, M., Caurla, S. (2020) The diversity of representations in economic models of the forest sector, ***Oeconomia***, 10-3:521-553.
* Price, C., Sjølie, H., Caurla, S., Yousefpour, R., Meilby, H. (2020) Optimal rotations with declining discount rate: incorporating thinning revenues and crop formation costs in a cross-European comparison, ***Forest Policy & Economics***, 118: 102218.
* Lenglet, J., Caurla, S. (2020) Territorialisation et écologisation dans la filière forêt-bois française : une rencontre fortuite ?, ***Développement durable et territoires*** 11(1) DOI: [10.4000/developpementdurable.16645](https://doi.org/10.4000/developpementdurable.16645)
* Riviere, M., Caurla, S., Delacote, P. (2020) Evolving integrated models from narrower economic tools: the example of Forest Sector Models, ***Environmental Modeling and Assessment***, 25: 453-469.
* Caurla, S., Lobianco, A. (2020) Estimating climate service value in forestry: the case of climate information on drought for maritime pine in Southwestern France, ***Climate Services***, 17: 100106.
* Petucco, C., Lobianco, A., Caurla, S. (2020) Economic evaluation of an invasive forest pathogen at a large scale: the case of ash dieback in France, ***Environmental Modeling and Assessment***, 25: 1-21.
* Fortin, M., Pichancourt, J-B., Melo, L., Colin, A., Caurla, S. (2019) The effect of stumpage prices on large-area forest growth forecasts based on socio-ecological models, ***Forestry***, 92: 339-356.
* Beaussier, T., Caurla, S., Bellon-Maurel, V., Loiseau, E. (2019) Coupling economic models and environmental assessment methods to support regional policies: a critical review, ***Journal of Cleaner Production***, 216: 408-421.
* Caurla, S., Bertrand, V., Le Cadre, E., Delacote, P. (2018) Heat or power: how to increase the use of energy wood at the lowest costs? ***Energy Economics****,* 75: 85-103.
* Lenglet, J., Courtonne, J-Y., Caurla, S. (2017) Material flow analysis of the forest-wood supply chain: A consequential approach for log export policies in France*.* ***Journal of Cleaner Production***, 165: 1296-1305.
* Brunette, M., Caurla, S. (2016) An Economic Comparison of Risk Handling Measures against Hylobius abietis and Heterobasidion annosum in the Landes de Gascogne Forest. ***Annals of Forest Science,*** 73: 777–787.
* Lobianco, A., Caurla S., Delacote P., Barkaoui, A. (2016) Carbon mitigation potential of the French forest sector under threat of combined physical and market impacts due to climate change, ***Journal of Forest Economics***, 23: 4-26.
* Lobianco, A., Delacote P., Caurla S., Barkaoui, A. (2016) Accounting for active management and risk attitude in forest sector models. An impact study on French forests. ***Environmental Modeling and Assessment***, 21(3): 391-405.
* Lenglet, J., Courtonne, J-Y., Caurla, S. (2016) Évaluation et représentation des flux de bois dans la filière. ***Revue Forestière Française***, 68(2): 193-195.
* Caurla, S., Garcia, S., Niedzwiedz, A. (2015) Store or export? An economic evaluation of financial compensation to forest sector after windstorm. The case of Hurricane Klaus. ***Forest Policy and Economics***, 61: 30-38.
* Lobianco, A., Delacote P., Caurla S., Barkaoui, A. (2015) The importance of introducing spatial heterogeneity in bio-economic forest models: Insights gleaned from FFSM++, ***Ecological Modelling***, 309–310: 82-92.
* Caurla, S. (2014) Le modèle FFSM 1.0: de l’outil de recherche en économie à son utilisation pour l’aide à la décision, ***Revue Forestière Française***, 66(3): 313-324.
* Caurla, S. (2013) Une typologie et une histoire des modèles économiques de secteur forestier. ***Revue Forestière Française***, 65(2):163-182.
* Caurla, S., Delacote, P., Lecocq, F., Barthes, J., Barkaoui, A. (2013) Combining an inter-sectoral carbon tax with sectoral mitigation policies: Impacts on the French forest sector. ***Journal of Forest Economics***, 19(4): 450-461.
* Caurla, S., Lecocq, F., Delacote, P., Barkaoui, A. (2013) Stimulating fuelwood consumption through public policies: An assessment of economic and resource impacts based on the French Forest Sector Model, ***Energy Policy***, 63: 338-347.
* Wernsdörfer, H., Colin, A., Bontemps, J-D., Chevalier, H., Pignard, J., Caurla, S., Leban, J-M., Hervé, J-C., Fournier, M. (2012) Large scale dynamics of a heterogeneous forest resource are jointly driven by geographically varying growth conditions, tree species composition and stand structure, ***Annals of Forest Science***, 69(7): 829-844.
* Lecocq F., Caurla S., Delacote P., Barkaoui A., Sauquet A. (2011) Paying for forest carbon or stimulating fuelwood demand? Insights from the French Forest Sector Model, ***Journal of Forest Economics***, 17(2), 157-168.
* Sauquet, A., Lecocq, F., Delacote, P., Caurla, S., Garcia, S., Barkaoui, A. (2010) Estimating Armington Elasticities for Sawnwood and Application to the French Forest Sector Model, ***Energy and Resource Economics***, 33(4): 771-781.

## Contributions in collective books

* Roux A. (coord.), Colin A. (coord.), Dhôte J.-F. (coord.), Schmitt B. (coord.), Bailly A., Bastien J.-C., Bastick C., Berthelot A. Bréda N., Caurla S., Carnus J.-M., Gardiner B., Jactel H., Leban J.-M., Lobianco A., Loustau D., Marçais B., Meredieu C., Pâques L., Rigolot E., Saint-André L., Guehl J.-M., (2020). Filière forêt-bois et atténuation du changement climatique: entre séquestration du carbone en forêt et développement de la bioéconomie. Versailles, éditions Quæ, 170 p. DOI: [10.35690/978-2-7592-3121-8](https://www.quae-open.com/produit/150/9782759231218/filiere-foret-bois-et-attenuation-du-changement-climatique)
* Food and Agriculture Organization of the United Nations, FAO (2016). Forestry for a low-carbon future: integrating forests and wood products in climate change strategies. ISBN 978-92-5-109312-2.

## International research conferences

* *Estimating climate service value in forestry: the case of climate information on drought for maritime pine in Southwestern France.* World Conference of the International Union of Forest Research Organizations (IUFRO), October 2019; Curitiba, Brazil.
* *From early attempts to recent trends: economic simulation as an investigation tool for the forest sector.* World Conference of the International Union of Forest Research Organizations (IUFRO), October 2019; Curitiba, Brazil.
* *Drivers and leeways behind the French Forest Sector*. Section Conference of the International Union of Forest Research Organizations (IUFRO), September 2017; Nancy, France.
* *Material flow analysis of the forest-wood supply chain: a consequential approach for logs exports policies in France*. Conference of the French Association of Environmental and Resource Economists (FAERE), September 2016; Bordeaux, France.
* *Store or export? An economic evaluation of financial compensation to forest sector after windstorm. The case of Hurricane Klaus* :
	+ Conference of the European Association of Environmental and Resource Economists (EAERE), June 2015; Helsinki, Finland.
	+ Conference of the Scandinavian Society of Forest Economics (SSFE), May 2014; Uppsala, Sweden.
* *Stimulating fuelwood consumption through public policies: an assessment of economic and resource impacts based on the French Forest Sector Model*, Conference of the European Association of Environmental and Resource Economists, June 2013; Toulouse, France.
* *Combination of a carbon tax and direct mitigation policies: potential impacts on the forest sector:*
	+ Forest Economics Laboratory biennial workshop; May 2012; Nancy, France.
	+ GIP EcoFor international conference “Tackling climate change: the contribution of forest scientific knowledge”, May 2012; Tours, France.
* *Retributing carbon in situ or subsidizing biomass energy? Insights on the French forest sector* :
	+ World Conference of the International Union of Forest Research Organizations (IUFRO), August 2010, Seoul, South Korea.
	+ International Energy Workshop (IEW), June 2010 ; Stockholm, Sweden.
* *The French Forest Sector Model: a bio-economic tool to assess climate policies impacts on the forest sector*. World Forest Congress, October 2009 ; Buenos Aires, Argentina.
* *Fuelwood consumption, restrictions about resource availability and public policies: impacts on the French forest sector*. International Energy Workshop (IEW), June 2009 ; Venice, Italy.

## Expertises and reports (in French)

* Lenglet, J., Courtonne, J-Y, Caurla, S. (2015) « Evaluation et analyse des flux de bois dans le Grand Est ». Study agreement n°2015-01 between the Regional Directorate of Agriculture, Food and Forestry of Lorraine and AgroParisTech concerning the realization of a study on wood flows in the North-East interregion.
* Caurla S., Garcia S., Montagné-Huck C., Niedzwiedz A. (2013). Study of the "mobilization" component of the national solidarity plan following the damage caused to forests by the Klaus storm of 24 January 2009. Scientific report by the Forest Economy Laboratory in application of the DGPAAT contract 2012-098. September 2013. 52p.

## Research transfer articles (selection)

* **Caurla, S., Delacote, P., Rivière, M. (2021) La validation des modèles de simulation-prospective Panorama des méthodes et applications aux modèles de secteur forêt-bois. *AgEcon search* DOI :** [10.22004/ag.econ.311327](http://dx.doi.org/10.22004/ag.econ.311327) (*In French*)
* **Caurla, S.,** Montagné-Huck, C. (2017) [Quels outils économiques pour analyser les innovations bioéconomiques dans les filières forêt-bois à l’échelle du territoire ?](https://www6.inra.fr/ciag/Revue/Volumes-publies-en-2017/Volume-56-Mars-2017) **Innovations Agronomiques**, 56: 59-70. (*In French*)
* **Caurla S.,** Delacote, P. (2014) [Taking forestry issues into account in the fight against climate change: lessons from French Forest Sector Modeling](https://www.chaireeconomieduclimat.org/publications/policy-briefs/policy-brief-2014-04-enjeux-forestiers-changement-climatique/). **Policy Brief** 2014-04, Chaire économie du climat.
* **Caurla, S.,** Delacote, P. (2014). [Climate change mitigation in temperate forests: the case of the French forest sector](https://www.chaireeconomieduclimat.org/publications/info-debats/information-et-debats-35/). **Information et débats** 2014-35, Chaire économie du climat.
* **Caurla, S.,** Delacote, P. (2012). [FFSM: un modèle de la filière forêts-bois française qui prend en compte les enjeux forestiers dans la lutte contre le changement climatique](http://ageconsearch.umn.edu/bitstream/149688/2/iss12-4.pdf), **INRA Sciences Sociales** 4/2012. (*In French*)

# Teaching Activities

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| --- | --- | --- |
| **AgroParisTech & Lorraine University** **(Master 2 in Economics and 3rd year Forest Engineering Degree)** | **Forest Carbon Economics*** Mitigation options in the forestry sector and their economic potential
	+ Nature of the carbon flows
	+ Economic potential of mitigation options
	+ Substitution effect
* Use of the mitigation options in climate policies
	+ History since Kyoto (1990-2020)
	+ COP 21- COP 23 (post-2020)
* Nature, calculation and use of the carbon price
	+ The Social Cost of Carbon
	+ The carbon tax
* Voluntary forest sequestration projects and REDD+ mechanisms
* Part of the course is recorded and videos are available in [this folder](https://lef-nancy.org/files/index.php/s/EseyToqq22nxMkc) (lectures in French)
 | 2015-2021 (30h/yr) |
| **Lorraine University (Master 2 in Economics)** | **Evaluation and Protection of the Environment*** History of environmental issues in economics
* The origin of the sustainability issue
* From utilitarian thinking to welfare economics
* Welfare economics and its application to the environmental question
* Optimal pollution level in an efficient market
* Environmental policy instruments
* Part of the course is recorded and videos are available in [this folder](https://lef-nancy.org/files/index.php/s/Xazy8xSWkZgjfMM) (lectures in French)
 | 2017-2021(18h/yr) |
| **Lorraine University (Master 2 in Soil Sciences)**  | **Introduction to Environmental Economics*** Introduction to economics: basic concepts and founding theorems
* History of environmental economics
* The market equilibrium
* The origin of the sustainability issue
* The notion of pollution optimum
* The instruments of environmental policies
* The valuation of environmental goods
* Cost-benefit analysis
* Slides available [here](https://lef-nancy.org/files/index.php/s/i5ePJeyPfYc55YD) (in French)
 | 2012-2018(10h/yr) |
| **Agronomy and Food Sciences Engineering School (ENSAIA, 1st year Engineering degree)** | **Macroeconomics*** Macroeconomic indices and cycles
* Deindustrialization
* Money (money creation, inflation)
 | 2012-2013(30h/yr, tutorials) |

# Supervision Activities

## PhD supervision

* Guillaume Salzet (2020-present): Coupling ecological and economic models to define sustainable development scenarios for the forest and wood industries of French Guiana forestry.
* Valentin Mathieu (2020-present): International timber trade modeling: impact of the new Silk Road in Asia on international timber trade.
* Miguel Rivière (2017-2021): How to combine wood production and ecosystemic services in forest? Assessment of the environmental and economic impacts on the French forest sector.
* Thomas Beaussier (2016-2020): Assessing the impacts of prospective scenarii in territorial Life Cycle Analysis. Application to a forest territory.

## Master thesis supervision

* Valentin Mathieu (2019): Analysis of wood trade flow models from the perspective of notions of place, space and scale.
* Guillaume Salzet (2018): Spatial analysis of industrial clusters in the French forestry-wood sector and their impact on harvesting probability.
* Jemma Lemarchand (2017): Climate services values in forest and agriculture.
* Guillaume Hellot (2016): Economic resilience of the forestry sector in the Ballons des Vosges Natural Park.
* Loïc Kawalec (2016): Development of a model for the evaluation of environmental and economic impacts of prospective scenarios in the forestry sector.
* Jonathan Lenglet (2015): Evaluation of wood flows in the Grand Est region.
* Alexandre Gourdy (2012): Pathogen risks in forests.

## Participation in PhD juries

* Elias Olofsson, 2021: *Spatial forest resource competition: an economic study. How increased competition and production flexibility affect woody feedstock markets?* (Discipline: Economics; Luleå University of Technology, Sweden).
* Ottone Scammacca, 2020: *How to assess mining risks at the territory scale? The example of gold mining in French Guiana* (Discipline: Geosciences; Lorraine University, France).

## Participation in PhD committees

* Rémi Demol, 2018: *Hydrogen Production from Biomass and Waste Gasification, Techno-Economic Assessment of Innovative Solutions* (Discipline: Chemistry; Lorraine University, France).
* Ghenima Amer, 2017: *Assessing the conditions for securing the wood biomass supply of a bioalcohol unit* (Discipline: Economics; Clermont-Auvergne University, France).
* Jonathan Lenglet, 2016: *Les territoires de la filière forêt-bois. Recompositions et adaptations d’un secteur en changement* (Discipline : Geography; University Paris 1, France).

# Professional training

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| **ENPC School of International Management** | **Doctoral Program in Management** (4 weeks mini-MBA)Negotiation – Finance – Marketing – Accounting – Management | 2009 |
| **INRAE** | **Proximity Management** (5 days professional training)Human resources – Conflict management – Organization of time – Team cohesion – Delegation – Psychosocial risks | 2019 |

# Languages (CEFR reference levels)

**Mother Tongue** : French

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|  | Understanding | Speaking | Writing |
|  | Listening | Reading | Spoken interaction | Spoken Production |
| English | C1 | C2 | C1 | C2 | C2 |
| Spanish | B1 | B1 | A2 | A2 | A2 |
| German | A1 | A1 | A1 | A1 | A1 |

# Computing Skills

* Programming Languages: G.A.M.S (Advanced); Julia language programming (Beginner); R (Beginner)
* Standard GIS usage (QGis/ArcGis)
* Advanced usage of Word, Excel, PowerPoint, LaTeX