

Georges Kunstler

IAE

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Marié, deux enfants

University studies and diplomas

- 1996 – 1998 **Classes préparatoires**, *Lycée du Parc - Lyon*.
Biology, Geology, Mathematics and Physics
- 1998 – 2000 **French Institute of Forestry, Agricultural and Environmental Engineering**,
FIF-ENGREF Nancy.
- 2000 – 2001 **Master in Ecology and Evolutionary biology**, *University Montpellier II*.
- 2005 **PhD. Thesis in Ecology**, *University Montpellier II*, Late- successional species dynamics and landscape transformation, Supervised by T. Curt & J. Lepart.
Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier
- 2015 **HDR. Thesis in Ecology**, *University Joseph Fourier Grenoble*, Trees interactions and forest communities dynamics along abiotic gradients.

Professional research experience

- 2001 – 2004 **PhD. student**.
Irstea Clermont-Ferrand, Cefe-CNRS Montpellier
- 2005 – 2006 **Post-doc**, *David Coomes Cambridge University*, UK, Waitutu Temperate Forest Simulation Model development (SORTIE-NZ). A collaborative project with.
◦ Landcare Research (NZ) Rob Allen,
◦ Institut of Ecosystem Studies (USA) Charles Canham.
- 2006 – 2012 **Research Scientist**, *Irstea Grenoble*, Unit Mountain Ecosystems.
- 2012 – 2015 **Marie-Curie Fellow**, *Macquarie University Sydney - Irstea Grenoble*, with Mark Westoby.

Presentation of Irstea

Irstea is a French public research institute focusing on land and water management and formerly known as Cemagref. Its research aims on the production of new knowledge and technical innovations used by managers, policy makers and private companies to meet specific societal issues in the areas of resource management, development and land-use. Irstea research is largely focused on applied research that aims producing practical solutions for stakeholders. Research on forest ecosystems has long been done in collaboration with the National Forest Service.

Membership of Scientific boards and committees

Member of the board of the French Ecological Society.

Research projects

- 2008 – 2011 **REGECLIM DGFAR**.
Ministry of agriculture. Monitoring forest regeneration under climate change
- 2008 – 2012 **Project INTERREG France-Suisse**.
Mountain forest and protection against natural hazard
- 2008 – 2012 **Project INTERREG Alcotra Italie-France**.
Mountain forest and protection against natural hazard
- 2009 – 2012 **BACCARA FP7**.
Biodiversity And Climate Change: A Risk Analysis. PI H. Jactel INRA

- 2009 – 2012 **MANFRED Project Alpine Space.**
Management strategies to adapt Alpine Space forests to climate change risks
- 2012 – 2014 **DIVCLIM DEB project.**
Ministry of environment project. Forest diversity and climate change. PI Georges Kunstler
- 2012 – 2015 **DEMO-TRAIS Marie-Curie Project FP7.**
with Mark Westoby Macquarie University Sydney

Referee and evaluation

Journals Journal of Ecology, Ecology Letters, Ecological Monographs, Diversity and Distribution, Annals of Forest Science, Forest Ecology and Management, Ecological Modelling, Ecological Monographs, Journal of Biogeography, Journal of Vegetation Science, Forestry, Revue de Climatologie, Plant Ecology, New Zealand Journal of Ecology, Ecography, Global ecology and biogeography, Journal of theoretical biology, Functional Ecology, Oikos, Global Change Biology.

Funding agencies NSF, FP7, OSUG, GICC, ETH

Supervision

- PhD**
- **Thomas Bourdier**, third supervisor - 2016. Size inequality and forest productivity. Université Grenoble Alpes.
 - **Emmanuel Defosse**, main supervisor - 2012. Climate change and tree recruitment in mountain forest. Université Joseph Fourier, Grenoble I.
 - **Ghislain Vieilledent**, second supervisor - 2009. Structuring uncertainty and variability of ecological processes in forest dynamics models – Application to Silver Fir and Norway Spruce coexistence. Université Joseph Fourier, Grenoble I.
- Post-Doc**
- **Flore Viard-Cretat**, 2010-2012. Climate, functional composition and diversity drive forest productivity in the French Alps.
 - **Katalyn Csillery**, 2011-2012. Hierarchical Bayesian models to estimate size, competition and climate effect on tree mortality.
- Master I**
- **Guillaume Consoli**, Pine recruitment, vegetation competition and climate change.
 - **Jeanne Pottier**, Tree recruitment along an elevation gradient.

PhD comity and jury

- PhD comity**
- J. Fayard – Inra Avignon – Seed dispersion of *Cedrus*,
 - A. Amm – Inra Avignon – *Abies alba* and *Fagus sylvatica* recruitment along climatic gradient,
 - C. Dantec – Inra Bordeaux – Phylogenetic diversity of *Quercus*: selection by frost and Oidium,
 - N. Gaudio – Irstea Nogent sur Vernission - Interaction for light between adult trees, seedlings and ground vegetation.
 - M. Seignobosc - Irstea Grenoble. Climate change and tree mortality.
 - G. Lagarrigues - Irstea Grenoble. Climate change and Forest modelling.
 - C. Viguier - Irstea Grenoble. Grasslands individual-based model.
- PhD jury**
- Y Monnier - University Aix-Marseille I - Stratégies d'acclimatation à l'ombre et rôle des interactions plantes-plantes dans la dynamique pin-chêne en milieu méditerranéen,
 - E. Lines - Cambridge University, UK - Forest dynamics at regional scales : predictive models constrained with inventory data.
 - Blaise Tymen - University Toulouse - Tropical forest dynamics and LIDAR analysis.

Teaching experience

- At Irstea, teaching is not part of my compulsory duty. However, I teach regularly some courses on Models & Ecology at University Joseph Fourier Grenoble, Master Biodiversity, Ecology and Environment. I teach on average 25 hours per year.

Publications

1. **Kunstler, G**, T Curt, and J. Lepart (2004). "Spatial pattern of beech (*Fagus sylvatica* L.) and oak (*Quercus pubescens* Mill.) seedlings in natural pine (*Pinus sylvestris* L.) woodlands". In: *European Journal of Forest Research* 123, pp. 331–337.
2. Coll, L, Bernard Prévosto, P. Balandier, and **G Kunstler** (2005). "Plasticity in growth, biomass allocation and root morphology in beech seedlings as induced by irradiance and herbaceous competition". In: *Annals of Forest Science* 62, pp. 51–60. DOI: 10.1051/forest.
3. **Kunstler, G**, T Curt, M Bouchaud, and J. Lepart (2005). "Growth, mortality, and morphological response of European beech and downy oak along a light gradient in sub-Mediterranean forest". In: *Canadian Journal of Forest Research* 35, pp. 1657–1668.
4. Alvarez, N., L. Mercier, M. Hossaert-McKey, Jorge Contreras-Garduño, **G. Kunstler**, A. Aebi, and B. Benrey (2006). "Ecological distribution and niche segregation of sibling species: the case of bean beetles, *Acanthoscelides obtectus* Say and *A. obvelatus* Bridwell". In: *Ecological Entomology* 31.6, pp. 582–590.
5. **Kunstler, G**, T Curt, M Bouchaud, and J. Lepart (2006). "Indirect facilitation and competition in tree species colonization of sub-Mediterranean grasslands". In: *Journal of Vegetation Science* 17, pp. 379–388.
6. Bee, J N, **G Kunstler**, and D A Coomes (2007). "Resistance and resilience of New Zealand tree species to browsing". In: *Journal of Ecology* 95.5, pp. 1014–1026.
7. Debain, Sandrine, Joël Chadœuf, T Curt, **Georges Kunstler**, and J. Lepart (2007). "Comparing effective dispersal in expanding population of *Pinus sylvestris* and *Pinus nigra* in calcareous grassland". In: *Canadian Journal of Forest Research* 37.4, pp. 705–718.
8. **Kunstler, Georges**, J Chadoeuf, Etienne K Klein, Thomas Curt, Monique Bouchaud, and Jacques Lepart (2007a). "Tree colonization of sub-Mediterranean grasslands: effects of dispersal limitation and shrub facilitation". In: *Canadian Journal of Forest Research* 37.1, pp. 103–115.
9. **Kunstler, Georges**, Wilfried Thuiller, Thomas Curt, Monique Bouchaud, René Jouvie, Florian Deruelle, and Jacques Lepart (2007b). "*Fagus sylvatica* L. recruitment across a fragmented Mediterranean Landscape, importance of long distance effective dispersal, abiotic conditions and biotic interactions". In: *Diversity and Distributions* 13.6, pp. 799–807.
10. Boulant, Nadine, **Georges Kunstler**, Serge Rambal, and J. Lepart (2008). "Seed supply, drought, and grazing determine spatio-temporal patterns of recruitment for native and introduced invasive pines in grasslands". In: *Diversity and Distributions* 14.5, pp. 862–874.
11. Brooker, R W, F T Maestre, R M Callaway, C L Lortie, L A Cavieres, **G Kunstler**, Pierre Liancourt, K Tielborger, J M J Travis, Fabien Anthelme, C. Armas, L Coll, E Corcket, S Delzon, E Forey, Z Kikvidze, J Olofsson, F Pugnaire, C L Quiroz, Patrick Saccone, K Schiffrers, M Seifan, B Touzard, and R Michalet (2008). "Facilitation in plant communities: the past, the present, and the future". In: *Journal of Ecology* 96.1, pp. 18–34.
12. Coomes, D A, **Georges Kunstler**, C D Canham, and Elaine Wright (2009). "A greater range of shade-tolerance niches in nutrient-rich forests: an explanation for positive richness-productivity relationships?" In: *Journal of Ecology* 97.4, pp. 705–717.
13. Gross, Nicolas, **Georges Kunstler**, Pierre Liancourt, Francesco De Bello, Katharine Nash Suding, and Sandra Lavorel (2009). "Linking individual response to biotic interactions with community structure: a trait-based framework". In: *Functional Ecology* 23.6, pp. 1167–1178.
14. **Kunstler, Georges**, David A. Coomes, and Charles D. Canham (2009). "Size-dependence of growth and mortality influence the shade tolerance of trees in a lowland temperate rain forest". In: *Journal of Ecology* 97.4, pp. 685–695.
15. Vieilledent, Ghislain, Benoît Courbaud, **Georges Kunstler**, Jean-François Dhôte, and J S Clark (2009). "Biases in the estimation of size-dependent mortality models: advantages of a semiparametric approach". In: *Canadian Journal of Forest Research* 39.8, pp. 1430–1443.
16. Vieilledent, Ghislain, Benoît Courbaud, **Georges Kunstler**, and Jean-François Dhôte (2010a). "Mortality of silver fir and Norway Spruce in the Western Alps – a semi-parametric approach

- combining size-dependent and growth-dependent mortality". In: *Annals of Forest Science* 67.3, p. 305.
17. Vieilledent, Ghislain, Benoît Courbaud, **Georges Kunstler**, Jean-François Dhôte, and J S Clark (2010b). "Individual variability in tree allometry determines light resource allocation in forest ecosystems: a hierarchical Bayesian approach." In: *Oecologia* 163, pp. 759–773.
 18. Defosse, E., B. Courbaud, B. Marçais, W. Thuiller, E. Granda, and **G. Kunstler** (2011). "Do interactions between plant and soil biota change with elevation? A study on *Fagus sylvatica*". In: *Biology Letters* 7.5, pp. 699–701.
 19. **Kunstler, Georges**, Cécile H. Albert, Benoît Courbaud, Sébastien Lavergne, Wilfried Thuiller, Ghislain Vieilledent, Niklaus E. Zimmermann, and David A. Coomes (2011). "Effects of competition on tree radial-growth vary in importance but not in intensity along climatic gradients". In: *Journal of Ecology* 99, pp. 300–312.
 20. Courbaud, B, **G Kunstler**, X Morin, and T Cordonnier (2012). "Quel futur pour les services écosystémiques de la forêt alpine dans un contexte de changement climatique?" In: *Revue de Géographie Alpine*, pp. 1–12.
 21. Courbaud, Benoît, Ghislain Vieilledent, and **Georges Kunstler** (2012). "Intra-specific variability and the competition–colonisation trade-off: coexistence, abundance and stability patterns". In: *Theoretical Ecology* 5, pp. 61–71.
 22. **Kunstler, Georges**, Sébastien Lavergne, Benoît Courbaud, Wilfried Thuiller, Ghislain Vieilledent, Niklaus E Zimmermann, Jens Kattge, and David A Coomes (2012). "Competitive interactions between forest trees are driven by species' trait hierarchy, not phylogenetic or functional similarity: implications for forest community assembly." In: *Ecology letters* 15.8, pp. 831–40.
 23. Brooker, Rob, Zaal Kikvidze, **Georges Kunstler**, Pierre Liancourt, and Merav Seifan (2013). "The concept and measurement of importance: a comment on Rees et al. 2012". In: *Journal of Ecology* 101.6. Ed. by Kroon, Hans de, pp. 1369–1378.
 24. Csilléry, Katalin, Maëlle Seignobosc, Valentine Lafond, **Georges Kunstler**, and Benoît Courbaud (2013). "Estimating long-term tree mortality rate time series by combining data from periodic inventories and harvest reports in a Bayesian state-space model". In: *Forest Ecology and Management* 292, pp. 64–74.
 25. **Kunstler, Georges**, Robert B Allen, David A Coomes, Charles D Canham, and Elaine F Wright (2013). "Sustainable management, earthquake disturbances, and transient dynamics: modelling timber harvesting impacts in mixed-species forests". In: *Annals of forest science* 70.3, pp. 287–298.
 26. Rabasa, Sonia G., Elena Granda, Raquel Benavides, **Georges Kunstler**, Josep M. Espelta, Romá Ogaya, Josep Peñuelas, Michael Scherer-Lorenzen, Wojciech Gil, Wojciech Grodzki, Sławomir Ambrozy, Johan Bergh, José A. Hódar, Regino Zamora, and Fernando Valladares (2013). "Disparity in elevational shifts of European trees in response to recent climate warming". In: *Global Change Biology* 19.8, pp. 2490–2499.
 27. Rasmann, Sergio, Loïc Pellissier, Emmanuel Defosse, Hervé Jactel, and **Georges Kunstler** (2013). "Climate-driven change in plant-insect interactions along elevation gradients". In: *Functional Ecology* 28. Ed. by Bailey, Joseph K., pp. 46–54.
 28. Vila, Montserrat, Amparo Carrillo-Gavilán, Jordi Vayreda, Harald Bugmann, Jonas Fridman, Wojciech Grodzki, Josephine Haase, **Georges Kunstler**, MartJan Schelhaas, and Antoni Trasobares (2013). "Disentangling Biodiversity and Climatic Determinants of Wood Production". In: *PLoS ONE* 8.2. Ed. by Newsom, Lee A., e53530.
 29. Zimmermann, N. E., Robert Jandl, Marc Hanewinkel, **Georges Kunstler**, Christian Killing, Patrizia Gasparini, Andrej Breznikar, Eliane S., Signe Normand, Ulrich Ulmer, Thomas Gschwandtner, Holger Veit, Maria Naumann, Wolfgang Falk, Karl Mellert, Maria Rizzo, Mitja Skudnik, and Achilleas Psomas (2013). "Potential Future Ranges of Tree Species in the Alps". In: *Management Strategies to Adapt Alpine Space Forests to Climate Change Risks*. Ed. by Cerbu, Gillian, Hanewinkel, Marc, Gerosa Giacomo, and Jandl, Robert. InTech.
 30. Jung, Vincent, Cécile H. Albert, Cyrille Violle, **Georges Kunstler**, Grégory Loucougaray, and Thomas Spiegelberger (2014). "Intraspecific trait variability mediates the response of subalpine grassland communities to extreme drought events". In: *Journal of Ecology* 102.1, pp. 45–53.
 31. Thuiller, Wilfried, Tamara Münkemüller, Katja H. Schifffers, Damien Georges, Stefan Dullinger, Vincent M. Eckhart, Thomas C. Edwards, Dominique Gravel, **Georges Kunstler**, Cory Merow, Kara Moore, Christian Piedallu, Steve Vissault, Niklaus E. Zimmermann, Damaris

- Zurell, and Frank M. Schurr (2014). "Does probability of occurrence relate to population dynamics?" In: *Ecography* 37, pp. 1155–1166.
32. Cordonnier, Thomas and **Georges Kunstler** (2015). "The Gini index brings asymmetric competition to light". In: *Perspectives in Plant Ecology, Evolution and Systematics* in press.
 33. Defosse, Emmanuel, Benoit Courbaud, Olivier Lasbouygues, Katja Schiffers, and **Georges Kunstler** (2015). "The variation of direct and indirect interaction along climatic gradient depends on species strategies: an experiment on tree seedling survival." In: *Oikos* in revision.
 34. Forsyth, D M, D M Wilson, T A Easdale, **G Kunstler**, C D Canham, W A Ruscoe, E F Wright, L Murphy, A M Gormley, A Gaxiola, and D A Coomes (2015). "Century-scale effects of invasive deer and rodents on the dynamics of forests growing on soils of contrasting fertility". In: *Ecological Monographs* 85, pp. 84–93.
 35. **Kunstler, Georges**, Daniel Falster, David A. Coomes, Francis Hui, Robert M. Kooyman, Daniel C. Laughlin, Lourens Poorter, Mark Vanderwel, Ghislain Vieilledent, S. Joseph Wright, Masahiro Aiba, Christopher Baraloto, John Caspersen, J. Hans C. Cornelissen, Sylvie Gourlet-Fleury, Marc Hanewinkel, Bruno Herault, Jens Kattge, Hiroko Kurokawa, Yusuke Onoda, Josep Peñuelas, Hendrik Poorter, Maria Uriarte, Sarah Richardson, Paloma Ruiz-Benito, I-Fang Sun, Göran Ståhl, Nathan G. Swenson, Jill Thompson, Bertil Westerlund, Christian Wirth, Miguel A. Zavala, Hongcheng Zeng, Jess K. Zimmerman, Niklaus E. Zimmermann, and Mark Westoby (2016). "Plant functional traits have globally consistent effects on competition". In: *Nature* 529, pp. 204–207.
 36. Vanderwel, Mark C., Hongcheng Zeng, John P. Caspersen, **Georges Kunstler**, and Jeremy W. Lichstein (2016). "Demographic controls of aboveground forest biomass across North America". In: *Ecology Letters* 19.4, pp. 414–423.

Seminar, conferences, workshops and poster (o= oral, p= poster)

1. **Kunstler G.**, J. Lepart, T. Curt, B. Prévosto. (2002). Shade-tolerance and regeneration niche of European beech and Downy oak. Functional Ecology Meeting . Gourdon, 5-8 mars. (p)
2. **Kunstler G.**, J. Lepart, T. Curt, B. Prévosto. (2002). Shade-tolerance of European beech and Downy oak. Meeting of the Population Biology and Genetic Group. 27-30 august Montpellier. (p)
3. **Kunstler G.**, J. Lepart, T. Curt, M. Bouchaud. (2003). Growth-mortality relationship for European beech and Downy oak. Functional Ecology Meeting. Nancy. (o)
4. **Kunstler G.**, J. Lepart, T. Curt, M. Bouchaud. (2003). Shade-tolerance for European beech and Downy oak. Forest regeneration meeting. Nancy 4-5 November. (o)
5. **Kunstler, G.**, Coomes, D., Canham, C. Angiosperm trees outgrow conifer on fertile and infertile soils in New Zealand. 90th Annual Meeting of the Ecological Society of America (ESA) and IX INTECOL International Congress of Ecology. August 7-12 (2005). Montréal, Canada. (p)
6. **Kunstler, G.**, J. Lepart, T. Curt, J. Chadoff, E, Klein, M. Bouchaud. (2006). Colonisation des pelouses sub-méditerranéennes par les arbres : Effets de la limitation par la dispersion et de la facilitation par les buissons. Symposium "Ecologie des Communautés végétales". Institut Universitaire de Technologie de l'université d'Avignon, 05 au 07 avril. (o)
7. **Kunstler, G.**, T. Curt, J. Lepart. (2006). *Fagus sylvatica* L. recruitment in a fragmented Mediterranean Landscape. Importance of long distance effective dispersal from relictual populations, and effect of abiotic and biotic interactions. Understanding Biodiversity Loss: A Workshop on Forest Fragmentation. Grenoble 16-17 May 2006. (o)
8. **Kunstler G.**, J. Lepart, T. Curt, M. Bouchaud. (2006). Indirect facilitation of tree seedlings recruitment in Peri-Mediterranean forest. Arcachon ESF Workshop on facilitation. (o)
9. Evette, A., **Kunstler, G.** & Bornette, G. (2007). Peut-on estimer les parts respectives de l'adaptation et du poids phylogénique dans l'expression des traits de clonalité des communautés végétales ? Symposium "Ecologie des Communautés végétales". Université Bordeaux I, 14 au 16 mars. (o)
10. **Kunstler, G.** (2007). Modélisation de la dynamique de forêts tempérées humides de Nouvelle-Zélande. Séminaire URFM INRA Avignon. (o)
11. Bystrakova, N., **Kunstler G.** & Coomes D.A. (2007). Comparing tree fern diversity on tropical and non-tropical oceanic islands using climatic niche modelling approach. Botany and Plant Biology Joint (American Society of Plant Biologist & Botanical Society of America). Congress Chicago USA . (o)
12. **Kunstler, G.** Vieilledent, G. Courbaud, B. (2009). Impact of climate constraints and individual level variability on tree-tree interactions in mountain mixed-forests. Mixed Forests 6 – 7 Octobre

Nancy. (o) Invited.

13. Defosse E., Lasbouygues O., Courbaud B., Granda E, Tardif P & **Kunstler G.** 2010. Régénération des forêts : les taux d' herbivorie et d'infection par les pathogènes varient-ils le long d'un gradient altitudinal ? Ecologie 2010 2-4 Septembre 2010 Montpellier. (p)
14. **Kunstler, G.**, Albert, C. Coomes, D. Courbaud, B., Lavergne, S., Thuiller , W., Viard-Cretat, F., Vieilledent, G., Zimmermann, N. Is the strength of competition among tree species influenced by phylogenetic or functional relatedness? BES Annual Symposium 2011. Forests and Global Change, University of Cambridge, UK. 28 - 30 March 2011. (o)
15. Csillery, K., Cordonnier, T., Courbaud, B., **Kunstler, G.** (2011). Mortality of 30 tree species in the French Alps: the effects of climate. BES Annual Symposium 2011. Forests and Global Change, University of Cambridge, UK. 28 - 30 March 2011. (p)
16. Viard-Crétat, F. **Kunstler, G.** Plus de diversité, plus de productivité ? Climat, diversité fonctionnelle et productivité edes forêt des Alpes Françaises. ECOVEG 7. 30 Mars – 1 Avril 2011 EPFL Lausanne. (o)
17. **Kunstler, G.** (o) Tree regeneration vulnerability to climate change: relative contribution of direct climate effects, plant interactions, herbivores & pathogens in Mountain Forests. Tackling climate change the contribution of forest scientific knowledge. Tours 21-24 May 2012.
18. **Kunstler, G.**, Courbaud, B., Lavergne, S., Thuiller, W., Vieilledent, G., Zimmerman, N.E., Kattage, J.; Coomes, D.A. Competitive interactions between forest trees are driven by species' trait hierarchy, not phylogenetic or functional similarity: implications for forest community assembly. Annual Meeting of the Australian Ecological Society, Melbourne 3-6 Decembre 2012. (o)
19. **Kunstler, G.**, Competitive interactions between forest trees and traits a global analysis with tree radial growth. Ecotas, Auckland 24-28 November 2013. (o) Invited.
20. **Kunstler, G.** Functional traits have globally consistent effects on plant competition. BES-SFE Annual Joint Meeting Liile, 9-12 December 2014.
21. **Kunstler, G.** Functional traits have globally consistent effects on plant competition. Seminar SEM-Cefe 27 February 2015.