

## Marco Mina

### Senior Researcher

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## EDUCATION

- 2015      **Ph.D., ETH Zürich**, Switzerland - Forest Ecology  
Dissertation: *Forest dynamics, management and ecosystem services: the future of European mountain forests in an era of climate change*
- 2010      **M.Sc., University of Padua**, Italy - Forestry and Environmental Sciences
- 2007      **B.Sc., University of Padua**, Italy - Forestry and Environmental Technology

## ACADEMIC EXPERIENCE

- 2021 - now      **Senior Researcher** at Eurac Research  
Institute of Alpine Environment, Bolzano/Bozen, Italy
- 2018 - 2021      Postdoctoral Research Fellow at the Université du Québec à Montréal  
Centre for Forest Research CEF, Montreal, Canada
- 2016 - 2017      Postdoc at the Swiss Federal Institute for Forest, Snow and Landscape Research WSL  
Forest Resources and Management, Birmensdorf, Switzerland
- 2012 - 2015      Research Assistant (PhD candidate) at ETH Zürich  
Institute for Terrestrial Ecosystems, Chair of Forest Ecology, Zürich, Switzerland
- 2011 - 2012      Research Intern and Assistant at the Paul Scherrer Institute PSI  
Laboratory for Energy systems Analysis, Villigen, Switzerland
- 2007 - 2009      Technical Assistant at Paulownia Italia s.r.l., Venice, Italy

## RESEARCH GRANTS, FELLOWSHIPS & AWARDS

- 2023      **Special Mention** within the **Junior Research Award** Südtirol/Alto Adige
- 2023      **National Scientific Qualification** (ASN) as associate professor in the scientific sector 07/B2 - Arboriculture and forest systems (Session 2021-2023. Validity 02/2023–02/2033). Unanimous vote of the Committee
- 2021–23      **Marie Skłodowska-Curie Individual Fellowship**, granted by ERC H2020-MSCA-IF-2019, 24 months. Grant number 891671
- 2018–19      **Early Postdoc.Mobility Fellowship**, granted by the Swiss National Science Foundation 18 months, 94 500 CAD. Grant number 75101
- 2012–15      PhD studentship funded through European Union 7th Framework Programme for Research and Technological Development (FP7) for project ARANGE

## PUBLICATIONS

**Summary: 26 peer reviewed papers, 1350 total citations, h-index of 15, i10 index of 19**

### Peer Reviewed journal articles

1. Marzini S, Tasser E, Wellstein C, Albrich K, Rammer W, **Mina M** (2025). Future expansion of upper forest-grassland ecotone under land-use and climate change in the Eastern Alps. *Landsc Ecol.* 40, 55
2. von Meijenfeldt A., Chianucci F., Rigo F, Ottenburghs J, Hilpold A, **Mina M** (2025). Reliability of canopy photography for forest ecology and biodiversity studies. *Ecological Indicators* 172, 113293.
3. **Mina M**, Marzini S, Crespi A, Albrich K (2025). Building virtual forest landscapes to support forest management - the challenge of parameterization . *Forests Monitor* 2(1), 49-96.
4. Hof A R, **Mina M**, Mairota P, Aguilar F, Leitinger G, Bruna J, Koivula M, Klopčič M, Sjögren J, Vacchiano G. 2024. A perspective on the need for integrated frameworks linking species distribution and dynamic forest landscape models across spatial scales. *Frontiers in Ecology and Evolution.* 12, 1112712.
5. Chianucci F, Napoleone F, Ricotta C, Ferrara C, Fusaro L, Balducci L, Trentanovi G, Bradley O, Kovacs B, **Mina M**, Cerabolini B, (et al.), Burrascano S 2024. Silvicultural regime shapes understory functional structure in European forests. *Journal of Applied Ecology* 61 (10), 2350-2364.
6. Grünig M, Rammer W, Albrich K, André F, Augustynczyk ALD, Bohn F, Bouwman M, Bugmann H, Collalti A, Cristal I, Dalmonech D, De Caceres M, De Coligny F, Dobor L, Dollinger C, Forrester DI, Garcia-Gonzalo J, González JR, Hiltner U, Hlásny T, Honkaniemi J, Huber N, Jonard M, Jonsson AM, Lagergren F, Nieberg M, **Mina M**, Mohren F, Moos C, Morin X, Muys B, Peltoniemi M, Reyer CPO, Storms I, Thom D, Toigo M, Seidl R 2024. A harmonized database of European forest simulations under climate change. *Data in Brief* 54, 110384.
7. Díaz-Yáñez O, Käber Y, Anders T, Bohn F, Braziunas KH, Bruna J, Fischer R, Fischer SM, Hetzer J, Hickler T, Hochauer C, Lexer MJ, Lischke H, Mahnken M, Mairota P, Merganič J, Merganičová K, Mette T, **Mina M**, Morin X, Rammer W, Reyer CPO, Scheiter S, Scherrer D, Bugmann H. 2024. Tree regeneration in models of forest dynamics: a key priority for further research. *Ecosphere* 15(3)e4807.
8. Rigo F, Paniccia C, Anderle M, Chianucci F, Obojes N, Tappeiner U, Hilpold A, **Mina M**. 2024. Relating forest structural characteristics to bat and bird diversity in the Italian Alps. *Forest Ecology and Management* 554(121673)
9. Hillebrand L\*, Marzini S, Crespi A, Hiltner U, **Mina M\*** 2023. Contrasting impacts of climate change on protection forests of the Italian Alps. *Frontiers in Forests and Global Change* 6 1240235 [\*shared first authorship]
10. Osborn P, Aquilué N, **Mina M**, Moe K, Jemtrud M, Messier C 2023. A trait-based approach to both forestry and timber building can synchronize forest harvest and resilience. *PNAS Nexus* 2:8, pgad254
11. Suárez-Muñoz M, Herrero J, Bonet-García FJ, **Mina M** 2023. Forest management scenarios drive future dynamics of Mediterranean planted pine forests under climate change. *Landscape Ecology.* 38, 2069–2084.
12. **Mina M**, Messier C, Duveneck M, Fortin MJ, Aquilué N. 2022. Managing for the unexpected: building resilient forest landscapes to cope with global change. *Global Change Biology* 28, 4323– 4341
13. Searle EB, Bell WF, Laroque GR, Fortin M, Dacosta J, Sousa-Silva R, **Mina M**, Deighton HD 2021. Simulating the Effects of Intensifying Silviculture on Desired Species Yields across a Broad Environmental Gradient. *Forests.* 12(6).
14. Suárez-Muñoz M, **Mina M**, Salazar PC, Navarro-Cerrillo RM, Quero JL, Bonet-García FJ. 2021. A step-by-step guide to initialize and calibrate landscape models: a case study in the Mediterranean mountains. *Frontiers in Ecology and Evolution.* 9, 209.
15. Irauschek F, Barka I, Bugmann H, Courbaud B, Elkin C, Hlásny T, Klopčič M, **Mina M**, Rammer W, Lexer MJ. 2021. Evaluating five forest models using multi-decadal inventory data from mountain forests. *Ecological Modelling* 445, 109493

16. Aquilué N, Messier C, Martins K, Dumais-Lalonde V, **Mina M**. 2021. A simple-to-use management approach to boost adaptive capacity of forest to global uncertainty. *Forest Ecology and Management*. 481: 118692.
17. **Mina M**, Messier C, Duveneck M, Fortin MJ, Aquilué N. 2021. Network analysis can guide resilience-based management in forest landscapes under global change. *Ecological Applications*. 31(1):e02221.
18. Messier C, Bauhus J, Doyon F, Maure F, Sousa-Silva R, Nolet P, **Mina M**, Aquilué N, Puettmann K. 2019. The functional complex network approach to foster forest resilience to global changes. *Forest Ecosystems*. 6:21.
19. **Mina M**, Del Rio M, Huber MO, Thürig E, Rohner B. 2018. The symmetry of competitive interactions in mixed Norway spruce, silver fir and European beech forests. *Journal of Vegetation Science*. 29:775–87.
20. Houpert L, Rohner B, Forrester DI, **Mina M**, Huber MO. 2018. Mixing Effects in Norway Spruce-European Beech Stands Are Modulated by Site Quality, Stand Age and Moisture Availability. *Forests*. 9(2), 83.
21. **Mina M**, Huber MO, Forrester DI, Thürig E, Rohner B. 2018. Multiple factors modulate tree growth complementarity in central European mixed forests. *Journal of Ecology*: 106:1106–1119.
22. Klopčič M, **Mina M**, Bugmann H, Bončina A. 2017. The prospects of silver fir (*Abies alba* Mill.) and Norway spruce (*Picea abies* (L.) Karst) in mixed mountain forests under various management strategies, climate change and high browsing pressure. *European Journal of Forest Research* 136:1071–1090.
23. **Mina M**, Bugmann H, Klopčič M, Pardos M, Irauschek F, Cordonnier T, Cailleret M. 2017. Future ecosystem services from European mountain forests under climate change. *Journal of Applied Ecology*. 54:389-401.
24. **Mina M**, Bugmann H, Klopčič M, Cailleret M. 2017. Accurate modeling of harvesting is key for projecting future forest dynamics: a case study in the Slovenian mountains. *Regional Environmental Change* 17:49-64.
25. **Mina M**, Martin-Benito D, Bugmann H, Cailleret M. 2016. Forward modeling of tree-ring width improves simulation of forest growth responses to drought. *Agricultural and Forest Meteorology* 221:13-33.
26. Meyer N.K., **Mina M**. 2012. Wood energy fuel cycle optimization for beech and spruce forests. *Environmental Research Letters*, 2012, 7, 014001.

#### *Other publications (Book chapters, reports, dissemination articles)*

Hilpold A, Anderle M, Guariento E, Marsoner T, Mina M, Obwegs L, Paniccia C, Seeber J, Strobl J, Vanek M, Bottarin R, Tappeiner U, 2025. Monitoraggio della biodiversità Alto Adige – Rapporto I, Bolzano/Bozen, Italia: Eurac Research

Hilpold A., Anderle M., Guariento E., Marsoner T., **Mina M.**, Paniccia C., Plunger J., Rigo F., Ruedisser J., Scotti A., Seeber J., Steinwandter M., Stifter S., Strobl J., Suárez-Munoz M., Vanek M., Bottarin R., Tappeiner U. 2022. Handbook Biodiversity Monitoring South Tyrol. Eurac Research.

Messier M, Maure F, **Mina M**, Aquilué N. 2022 Le futur de la foresterie au Canada dans un monde incertain - quelques pistes de solution. In *Une économie écologique pour le Québec* eds. Mendez A, Bissonette JF, Dupras J. ISBN 978-2-7605-5560-0. 384 pg.

**Mina M**, Cailleret M, Motta R, Bugmann H. 2019. Fruizione futura dei servizi ecosistemici. Prospettive in funzione dei cambiamenti climatici e della gestione nelle foreste montane. *Rivista Sherwood* 239:23-27.

**Mina M**, Bugmann H. 2013. Improved and tested forest models for case study regions. Project Deliverable D2.1, FP7-289437-ARANGE, 44 pp, Institute of Terrestrial Ecosystems, ETH Zurich.

#### *Dissertations*

**Mina M**. 2016. Forest dynamics, management and ecosystem services: the future of European mountain forests in an era of climate change. Ph.D. thesis. ETH Zürich. Advisor Prof. H. Bugmann.

**Mina M.** 2010. Politiche ed istituzioni del settore forestale in Cina/Policies, Institutions and Markets in the P.R.C. forestry sector. M.Sc. thesis. University of Padua, Italy. Advisor Prof. D. Pettenella.

**Mina M.** 2007. Evoluzione della ectomicorizzazione in trapianti di farnia inoculati artificialmente in vivaio/Evolution of ecto-mycorrhization in artificially inoculated *Quercus robur* seedlings. B.Sc. thesis. University of Padua, Italy. Advisor Prof. L. Montecchio.

## CONFERENCES – selected, presenting author only

- 2024 **Mina M**, Hillebrand L, Marzini S, Hiltner U, Crespi A. Contrasting impacts of climate change on protective functions in mountain forests of the Alps. IUFRO World Congress. Stockholm, Sweden.
- 2023 **Mina M.** Modelling forest dynamics in an era of global change - from understanding to predictions. Spanish Association of Terrestrial Ecology AEET 2023, Almeria, Spain.
- Mina M.** Simulating biotic disturbances with forest landscape models - comparing different approaches in different forest ecosystems. European Conference of Ecological Modelling ECEM 2023, Leipzig, Germany.
- 2022 **Mina M**, Aquilué N, Duveneck M, Fortin MJ, Messier C. Managing for the unexpected - Building resilient forest landscapes to cope with global change. Ecological Society of America (ESA) Annual Meeting 2022. Montreal, Canada.
- Mina M**, Aquilué N, Messier C. Managing forests as functional networks - preparing our landscapes for the unexpected. XIII Congresso Nazionale SISEF “Alberi Foreste Biodiversità - Dal New Green Deal alla Farm to Fork Strategy”. Orvieto, Italy
- 2021 **Mina M**, Aquilué N, Duveneck M, Fortin MJ, Messier C. Managing the Unexpected – Resilient Forest Landscapes to Novel Climate and Insect Outbreak Disturbance Regimes. IALE-North America Annual Meeting, Reno, NV [virtual conference]
- 2020 **Mina M**, Aquilué N, Duveneck M, Fortin MJ, Messier C. Future trajectories in fragmented forest landscapes: linking simulation modelling with the functional complex network approach. Conference: Governing and managing forests for multiple ecosystem services across the globe. Bonn, Germany.
- Mina M**, Aquilué N, Duveneck M, Fortin MJ, Messier C. Seeing forest landscapes as functional complex networks: a way to enhance resilience to climate change and disturbances. Conference: Managing forests in the 21st century. Potsdam, Germany.
- 2019 **Mina M**, Duveneck M, Aquilué N, Fortin MJ, Messier C. Managing forest landscapes as functional complex networks to increase resilience: a simulation study. IALE World Congress, Milan, Italy
- 2018 **Mina M**, Aquilué N, Fortin MJ, Messier C. Coupling tree-community and landscape models with functional diversity and network theories for resilience-based forest management. ESA Annual Meeting, New Orleans, USA
- 2017 **Mina M**, Huber MO, Thürig E, Rohner B. Disentangling species mixture effects on individual-tree growth using Swiss national forest inventory data. IUFRO 125th Anniversary Congress, Freiburg, Germany <poster>
- 2016 **Mina M**, Huber MO, Thürig E, Rohner B. Integrating effects of species mixture into individual-tree growth models based on national forest inventory data. EUMIXFOR Final Conference, Prague, Czech Republic <poster>
- 2015 **Mina M**, Cailleret M, Bugmann H. Can adapted forest management sustain the provision of multiple ecosystem services in different European mountain regions? Mountains of Our Future Earth, UK
- Mina M**, Cailleret M, Bugmann H. Adaptive forest management is necessary to maintain ecosystem services in different European mountain regions. ARANGE Final Conference, Slovakia
- 2014 **Mina M**, Bugmann H, Klopčič M, Cailleret M. Which management under climate change? An assessment of the provisioning of ecosystem services in mountain forests. IUFRO Congress, Salt Lake City, USA <poster>

**Mina M**, Bugmann H, Klopčič M, Cailleret M. Does management of Slovenian Silver fir-European beech mountain forests need to be adapted to climate change? GfÖ Annual Meeting, Germany

2013 **Mina M**, Cailleret M, Bugmann H. Testing the applicability of a forest succession model in Mediterranean mountains. ClimTree Conference Zurich, Switzerland <poster>

## SKILLS AND COMPETENCES

Programming R, C#, SQL

Software ArcGIS, Git and Github, Microsoft Office (certified ECDL), Reference Management (EndNote, Mendeley, Zotero), Adobe Acrobat, Photoshop, Inkscape, Cofecha (tree-rings analysis), SimaPro and Ecoeditor (Life Cycle Assessment & Inventory), Web editing (HTML, WordPress, Hugo, Markdown)

Languages Italian native speaker  
English full proficiency  
German intermediate (B1)  
French intermediate (B1)

Scientific

- Use and development of process-based forest simulation models  
- ForClim, LANDIS-II, iLand, PnET
- Statistical modeling and analysis of large environmental datasets (e.g., forest inventories, sampling plots)
- Forest sampling for inventory, growth modeling, diversity, and structure
- Tree sampling for dendroecology and analysis of tree-ring data
- Scientific writing, blogging and science communication.

## OTHER SERVICES, ROLE AND MEMBERSHIPS

Consortium projects 2012 – 2015 *ARANGE* (EU FP7): Active member of the project consortium, preparation of project deliverables, data contributor, task co-responsible  
2016 – 2017 *Swiss-SpeMixMod* (Swiss Secretariat for Research and Innovation under the COST Action EuMIXFOR): Co-lead, co-author of annual reports

Reviewing *Peer-review for journals* (total: 40) Global Change Biology, Nature Communications, Journal of Ecology, Forest Ecology and Management, Global and Environmental Change, Agricultural and Forest Meteorology, Journal of Applied Ecology, Methods in Ecology and Evolution, PLOS ONE, Ecosystems, Ecosphere, and others.  
Web of Science ResearcherID: H-6047-2019

*Grant proposals for funding agencies* Biodiversa ERA-NET H2020, LabEx ARBRE

Editorial roles 2023- Scientific Board Member journal Forests Monitor  
2020 –21 Guest Associate Editor Frontiers in Forests and Global Change

Memberships 2021 – SwissForestLab (Associated member)  
2018 – Centre for Forest Research CEF-CFR  
2018 – Ecological Society of America  
2013 – Italian Society of Silviculture and Forest Ecology SISEF

Public outreach Contributing author for scientific blogs Forest Monitor (<http://www.forest-monitor.com/en/>) and EFI Resilience blog (<https://resilience-blog.com/>)

Teaching Invited lecturer in BSc and MSc course of studies  
2023/25 Free University of Bolzano, University of Milan, University of Torino  
2019/21 Université du Québec en Outaouais/ à Montréal (UQO/UQAM), Canada  
2018/19 University of Lleida, Spain (MSc European forestry Erasmus Mundus)

Mentoring and supervision Supervision of 1 PhD student (ongoing)  
Co-supervision of 1 PhD student (finished)  
Supervision of multiple MSc students and interns

Consultancy Technical assistant in a forestry consultancy company (Paulownia Italia srl)