

Thursday, 02 September 2021

**A. CURRICULUM VITAE**  
**MAURIZIO MENCUCCINI, Professor**

**Date of completion: 02/09/2021**

**Websites, blogging and scientific reference IDs**

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<https://www.icrea.cat/en/researcher/m.mencuccini>

Websites (UK): <http://www.geos.ed.ac.uk/people/person.html?indv=556>

**Social Media:** I used to have a (limited) presence on Facebook and Twitter. I chose to delete my social media accounts two years ago, following the Cambridge Analytica scandal and I am actively campaigning with colleagues to promote more responsible forms of engagement with social media.

**Google Scholar:** [https://scholar.google.es/citations?hl=en&user=p9DYm-AAAAAJ&view\\_op=list\\_works&sortby=pubdate](https://scholar.google.es/citations?hl=en&user=p9DYm-AAAAAJ&view_op=list_works&sortby=pubdate)

**ResearcherID:** <http://www.researcherid.com/rid/B-9052-2011>

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**Academia:** <http://edinburgh.academia.edu/MaurizioMencuccini>

**ResearchGate:** [https://www.researchgate.net/profile/Maurizio\\_Mencuccini](https://www.researchgate.net/profile/Maurizio_Mencuccini)

**Academic CV**

**1. Current Positions:** ICREA Research Professor of Plant and Ecosystem Ecology (Barcelona, Spain)

**2. Academic career**

- Lecturer (University of Edinburgh, UK, 1997 – 2002)
- Senior Lecturer (University of Edinburgh, UK, 2003 – 2006)
- Reader of Forest Science (University of Edinburgh, UK, 2007 – 2010)
- Professor of Forest Science (University of Edinburgh, UK, 2011-2016)
- ICREA Research Professor of Plant and Ecosystem Ecology (2012-ongoing)

**3. Previous jobs**

- Research Associate (Institute of Forest Ecology, University of Florence, 1989 – 1990)
- Research Associate (Forest Research Institute, Arezzo, Italy, 1991 – 1992)
- Postdoctoral Research Associate (Boyce Thompson Institute for Plant Research at Cornell University, Ithaca, NY, USA, 1995 – 1996)

**4. Degrees awarded**

- B.Sc. in Forest Sciences (first class, University of Florence, 1984 – 1988).

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- Ph.D. in Forest Ecology (University of Florence, 1992 – 1995).

### **5. Significant periods of leave during academic career**

- Visiting Research Fellow (Boyce Thompson Institute for Plant Research at Cornell University, Ithaca, NY, USA, 1998-99)
- Visiting Research Professor, Universitat Autònoma de Barcelona (Spain) (Dec 2008-Sept 2009)
- Distinguished Visiting Scientist, CSIRO, Hobart (Tasmania) (Jul-Aug 2011)
- Eminent Visiting Scientist, University of Western Sydney (Australia, short periods during 2013-2016)

### **6. Scientific awards**

- Ranked as Highly Cited Researcher (top 1% by citations) since 2018 in the field of Plant & Animal Science by Clarivate Analytics.
- Ranked as one of the top Italian Scientists in the area of Natural & Environmental Science by Via-Academy ([http://www.topitalianscientists.org/top\\_italian\\_scientists.aspx](http://www.topitalianscientists.org/top_italian_scientists.aspx)).
- Eminent Visiting Scientist (four times from 2013 to 2015), University of Western Sydney, Australia)
- Distinguished Visiting Scientist, CSIRO (Tasmania, Australia) in 2012

**7. Research interests** My major contributions to the advancement of scientific knowledge are in the study of the ecology of forest ecosystems and the impacts of climate change on forests. I have positioned myself at the interface between biological sciences and global change science. I have pursued the understanding of how plants, especially trees, function and interact with a changing abiotic and the biotic environment. I am deeply interested in how climate change is affecting the functioning of terrestrial ecosystems. My major contributions are in the following areas.

- **Biogeography of plant hydraulic functional traits.** I have been at the forefront in the establishment of global databases of hydraulic traits of woody plants. We have led the development and maintenance of a database (HydraTRY), which combines hydraulic and leaf economics traits for >2000 species (collaboration with B Choat). The database contains hydraulic data and it is in the process of being updated, with a new release planned for 2021 which will more than triple its present size (collaboration with S Jansen and B Hammond). We have developed methods for the study of the phylogenetic evolution of these traits (collaboration with K Dexter) and are currently working on the spatialization of these traits at the global scale using advanced machine learning tools. Beyond the development of the tools necessary to fully exploit these resources, the vision for the medium term is to develop an understanding of the environmental filters of hydraulic trait variability across the globe (drought as well as frost occurrence), the analysis of potential phylogenetic bottlenecks in the evolution of hydraulic safety margins, the development of functional schemes for the classification of vegetation based on hydraulic traits, the exploration of hydraulic differences in the structuring of communities, the development of a unified theory for the understanding of hydraulic 'strategies' of plants, a better understanding of plasticity and acclimation in hydraulic traits.

- **Modelling of plant hydraulic processes.** I have published on the modelling of tree hydraulic properties since my PhD years, using a variety of approaches, from simple empirical scaling exercises, to advanced Bayesian process-based models and to optimality-based approaches. I have led research on the integration of xylem and phloem water transport properties (collaboration with T Holttá), on the modelling of water storage in the bark of trees (collaboration with S Pfautsch) and, more recently, on the incorporation of optimal stomatal control schemes in complex ecosystem-based models of water and carbon cycles. I have contributed to the modification of stomatal control routines of a major terrestrial biosphere model (the UK JULES), with fundamental spin-offs on the control of water use (and energy partitioning) by terrestrial ecosystems that we are currently exploring (collaboration with P Cox). My group has created and continues to develop a process-based model, MEDFATE, that predicts the combined risks of drought-induced mortality and fire on vegetation under climate change scenarios, based on a realistic representation of hydraulic pools and fluxes. MEDFATE was originally created for the regional analysis of Mediterranean vegetation, but it is rapidly turning into a cutting-edge tool, being one of the very few

existing models globally that can represent vegetation dynamics (stand recruitment, growth, mortality) while realistically keeping track of water pools and fluxes. Further developments of our modelling capabilities are planned, thanks to the creation of a new ecosystem modelling facility at CREAM funded by the Severo Ochoa Centre of Excellence that will be led by M De Caceres in our group (the original creator of MEDFATE). The vision here is threefold, to create a platform a) that will allow to exploit the current creation of databases of drought-induced tree mortality that are ongoing globally to predict the spatial occurrence of future mortality episodes, b) that facilitates the analysis of vegetation dynamics of permanent plots in national forest inventories using functional traits and c) that can ingest remote sensing predictions of vegetation water content to examine the functioning of vegetation at large spatial scales.

- Impacts of global change on ecosystem processes in Tropical forests. Tropical forests store approximately 470 billion tonnes of carbon in their biomass and soil, are responsible for about one-third of global terrestrial primary productivity, regulate local meteorology and house a disproportionate amount of global Biodiversity. However, how tropical forest carbon and water stocks might alter in response to changes in climate and atmospheric composition is very uncertain. I have worked on identifying some of the major pathways of physiological vulnerability of forest tree species in the Amazon, especially with regard to the impacts of increased drought intensity and frequency on plant physiology (collaborations with P Meir and D Galbraith). I have conducted the first ever measurements of hydraulic vulnerability to embolism of mature trees in Amazon rainforests. These have proven very valuable to identify the significance of hydraulic traits in affecting forest biodiversity and their impacts on the carbon and water cycles of the Amazon. My vision here is to lead future efforts to synthesise this rapidly expanding amount of information to increase our understanding of the functional diversity of these forests.

- Size-related constraints in trees. I was among the first groups to pursue research of the causes of forest growth decline during stand ageing (together with groups in Oregon and Colorado) and, with my PhD work, I was the first to show that tall trees become hydraulically limited as they grow, i.e., become increasingly water stressed because of their stature. Over the years, I have also contributed to develop the theory of allometric analysis of tree hydraulic systems, which is central to any scaling analysis. These themes had fundamental interests for forest managers because of the need to better understand the optimal age of felling of trees. It has since become apparent that tall and old trees are more vulnerable to climate change than small young trees and are being lost at faster rates. Providing a better understanding of the processes involved in tree functional ontogeny and forest stand development has now become a global environmental priority, particularly since models appear to struggle to represent the variability in the control of fluxes of energy, carbon and water among different size classes of trees. I am actively involved in a new UK-based project investigating the risk of mortality induced by drought in the tallest broadleaves on earth, in Borneo (collaboration with L Rowland) and I am co-supervising a global review of this theme led by a Marie Curie fellow (Laura Fernandez de Uña, collaboration with N McDowell). I am actively involved in developing the theory for the scaling of non-standard hydraulic traits for large trees. My vision here is to couple these theoretical and empirical developments with the use of novel LiDAR technologies that allow precise quantification of the aboveground biomass distribution of trees.

## 8. Research grants

### *i. Current active grants (in Spain or elsewhere, only when listed as official collaborator)*

Awarding body	Ref. No.	Brief Title of Research	Total awarded	Role	Dates
EU-H2020	862221	Improving access to FORest GENetic resources Information and services for end-USers	7,000,000 tot 700,000 € EU to PI	PI	2021/2025
NERC (UK)	-	Using plant hydraulic scaling to predict the drought vulnerability of the world's tallest tropical trees	~ 800,000 £UK	Coll (PI, L Rowland)	2021-2025
Scottish Forestry Trust / FC (UK)	P17 – 273B	Predicting impacts of extreme weather events on UK forests	78,194 £UK	Coll (PIs, A Jump, M Perks)	2020-2023
NERC (UK) – FAPESP (Brazil)	-	Restoring neo-tropical dry ecosystems - is plant functional composition the key to success?	~ 1,500,000	Coll (PI, L Rowland)	2019-2023

			£UK (incl. matching grant in Brazil)		
<b>Met Office - CSSP Brazil Newton Fund (UK)</b>	-	Developing impacts modelling capability and understanding ecosystem responses to extremes.	~ <b>325,000</b> £UK	Coll (PI, L Rowland)	<b>2019-2021</b>
<b>Agencia Estatal Investigación (Spain)</b>	RTI2018-095297-J-I00	DATAFORUSE: Data-driven assessment of global patterns in tree drought responses and forest water use	142,000 € EU	Co-PI (PI R Poyatos)	<b>2019-2022</b>
<b>MINECO (Spain)</b>	CGL2017-89149-C2-1-R	DRESS, part 1: Uso del agua y estrategias de resistencia a la sequía a distintas escalas: desde los mecanismos homeostáticos a la dinámica regional de la vegetación.	<b>193,600</b> € EU (direct costs) + 1 PhD student	PI	<b>2018-2021</b>
<b>MINECO (Spain)</b>	CGL2017-89149-C2-2-R	DRESS, part 2: Uso del agua y estrategias de resistencia a la sequía a distintas escalas: modelando el uso del agua y resistencia a la sequía	<b>93,170</b> € EU (direct costs) + 1 PhD student	PI	<b>2018-2021</b>
<b>ARC (Australia)</b>	DP18010 2969	Role of top-down-rehydration in drought tolerance of mangroves.	<b>368,400</b> \$ AU	Coll (PI Prof M Ball)	<b>2018-2021</b>

*ii. Expired (in UK)*

<b>NERC (UK)</b>	TREMOR (Mechanisms and Consequences of increasing Tree Mortality in Amazonian rainforests)	<b>822,219</b> £UK	Coll	<b>2016-2019</b>
<b>MINECO (Spain)</b>	SAPFLUXNET: a global database of sap flow measurements to unravel the ecological drivers of transpiration in woody plants	142,000 € EU	Co-PI	<b>2015-2018</b>
<b>NERC Int.nl Opport Fund</b>	Linking biotic attack with tree mortality and canopy condition in droughted tropical rainforest	<b>39,655</b> £ UK	Coll	<b>2016-2018</b>
<b>NERC (UK)</b>	GREENHOUSE: Generating Regional Emissions Estimates with a Novel Hierarchy of Observations and Upscaled Simulation Experiments	<b>1,074,440</b> £UK	Coll	<b>2013-2017</b>
<b>NERC (UK)</b>	Understanding how drought affects the risk of increased mortality in tropical rain forests	<b>649,869</b> £UK	Co-I	<b>2012-2016</b>
<b>NERC NBAF (UK)</b>	Transcriptome-wide analysis of leaf stress at the xeric range edge of Pinus sylvestris	<b>20,000</b> £UK	Co-I	<b>2015-2016</b>
<b>NERC</b>	Impacts of nitrogen deposition on the forest carbon cycle: from ecosystem manipulations to national scale predictions	<b>868,756</b> £UK	PI	<b>2009-2014</b>
<b>NERC</b>	Perilous life at the xeric edge: drought-induced tree mortality in the Mediterranean	<b>498,305</b> £UK	PI	<b>2011-2015</b>
<b>NERC Isotope Geosciences Laboratory</b>	The role of nitrogen deposition in driving carbon uptake by forest ecosystems	<b>30,600</b> £UK	Sole	<b>2011-2012</b>
<b>NERC</b>	Swahili Seas. A REDD proposal for poverty alleviation and the prevention of Kenyan mangrove degradation	<b>254,236</b> £UK	Co-I	<b>2010-2012</b>
<b>Aviva plc</b>	Mangrove forests: Potential carbon sinks for mitigating climate change at Gazi Bay, Kenya	<b>150,000</b> £UK	Co-I	<b>2008-2011</b>
<b>Royal Society/ Brit Academy</b>	The role of nitrogen deposition in driving carbon uptake by forest ecosystems	<b>100,010</b> £UK	Sole	<b>2009-2011</b>
<b>Scottish Forestry Trust / Forestry Commission</b>	Developing the silviculture of continuous cover forestry: Using the experience and data collected from the Glentress Trial Area – PhD studentship	<b>33,413</b> £UK	PI	<b>2008-2011</b>
<b>Forestry Commission</b>	The Biology of Heartwood Formation and its Influence on Conifer Timber Quality – PhD studentship	<b>36,000</b> £UK	PI	<b>2007-2011</b>
<b>NERC</b>	The mangrove carbon cycle- influence of below-ground processes and managed cutting	<b>40,530</b> £UK	Co-I	<b>2009-2010</b>
<b>European Science</b>	Tracing the contribution of nitrogen deposition on carbon allocation in a forest: a triple isotope approach	<b>5,600</b>	Sole	<b>2009</b>

<b>Foundation</b>				
<b>NERC</b>	Arctic Biosphere Atmosphere Coupling at Multiple Scales (ABACUS Consortium)	500,000 £UK	Co-I	2006-2009
<b>Forestry Commission</b>	Physiological ecology of understorey trees in alternative management systems	60,000 £UK	PI	2005-2008
<b>Leverhulme Trust</b>	Recovery of ecosystem functions and coastal protection by replanted mangroves	63,726 £UK	Co-I	2004-2007
<b>NERC</b>	The influence of forest management on C sequestration, water balance and trace gas exchange	288,000 £UK	Co-I	2002-2007
<b>Forestry Commission</b>	The Stability of continuous cover forestry	45,000 £UK	PI	2004-2007
<b>NERC</b>	Endogenous regulation of age-related changes in forest net primary productivity	222,000 £UK	Sole	2002-2005
<b>EC FP V</b>	Mediterranean terrestrial ecosystems and increasing drought: vulnerability assessment	147,000	Sole	2002-2005
<b>Royal Society</b>	Scots pine water balance under different environmental conditions across Europe	1,280 £UK	Sole	Sept 2004
<b>ESF</b>	Methods for the detection of changes in soil carbon stocks under climate change (workshop)	16,600	PI	Mar-Oct 2003
<b>EC FP V</b>	Age-related dynamics of Carbon exchange in European forests	186,000	PI	2000-2003
<b>NERC</b>	Age-related changes in the processes underlying net ecosystem exchanges in coniferous forests	36,000 £UK	Sole	1999-2001
<b>NERC</b>	The impact of drought on water and carbon dioxide fluxes from a Brazilian rain forest	207,000 £UK	Co-I	1998-2001
<b>Scottish Forestry Trust</b>	The role of winter desiccation and frost in determining stem form in silver birch provenances	30,000 £UK	Sole	1999-2002
<b>NERC</b>	Variability in vulnerability to cavitation and whole-plant hydraulic conductance in trees of different age	20,000 £UK	Sole	1997-1998

### iii. Expired (in Spain or elsewhere)

<b>ARC (Australia)</b>	Hydraulic control on water use, growth and survival in tropical rainforest	354,000 \$ AU	Coll	2017-2020
<b>Marie Curie Sklodowska fellowship</b>	NITRIPHYLL: A novel approach to determine canopy nitrification in the phyllosphere of European forests: combining multiple isotope tracers and proteogenomic techniques	€ 158,121.60	PI	2016-2018
<b>MINECO. (Spain)</b>	Fun-to-Fun: an approximation to dynamics and functioning of forests based on functional attributes: implications for ecosystem services	164,000 € EU (direct costs) + 1 PhD student	PI	2014-2017
<b>ARC (Australia)</b>	Top-down rehydration: the role of multiple water sources in maintaining mangrove productivity along gradients in salinity and aridity.	495,938 \$ AU	Co-I	2015-2017
<b>NSF (USA)</b>	Aphid-like biosensors for ecosystem studies: NANAPHID proof of concepts	Around 2,000,000 \$ USA	Co-I	2014-2016
<b>ARC (Australia)</b>	Response and vulnerability of tropical rainforest plants to experimental drought	1,227,515 \$ AU	Co-I	2013-2016
<b>University Western Sydney (Australia)</b>	Using high-resolution stem diameter measurements to infer xylem and phloem transport properties of trees under climate change	455,000 \$ AU	Co-I	2012-2016
<b>Spanish Ministry of Education and culture</b>	Spanish woodlands and global change: threats and opportunities (MONTES Consortium)	3,448,276	Co-I	2008-2013
<b>Spanish Ministry of Education and Culture</b>	DRIM: Understanding the mechanism of DRought-Induced Mortality in trees	107,440	Co-I	2010-2012
<b>Spanish Ministry of Education and culture</b>	Ecological plasticity of Scots pine and possible changes in its distribution as a consequence of global change	102,746	Co-I	2007-2010

Spanish Ministry of Education and Culture	The xylem as a complex network for plant water transport	32,836	Co-I	2008-2009
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## 9. Research supervision experience

**Overall figures: 17 postdoctoral contracts, 28 PhD students, 9 visiting PhD students, 5 scientists in sabbatical.**

### i. Current postdoctoral fellows under my supervision/co-supervision:

Fellow	Funding Body	Title	Period
Paulo Bittencourt	Met Office CSSP Brazil Fund	Physiological determinants of global patterns in evapo-transpiration	2020-1
Laura Fernandez de Uña	Marie Curie Sklodovksa Fellowship	Functional traits controlling plant responses to height	2020-2022

### ii. Completed:

Holder	Position	Period	Funding Body	Title	Current Position
R Poyatos	postdoc	2018-9	Spanish Ministry for Education	Uso del agua y estrategias de resistencia a la sequía a distintas escalas: modelando el uso del agua y resistencia a la sequía	Assistant Professor, Universitat Autònoma de Barcelona (Spain)
R Guerrieri	postdoc	2018-9	Spanish Ministry for Education	Uso del agua y estrategias de resistencia a la sequía a distintas escalas: modelando el uso del agua y resistencia a la sequía	Assistant Professor, University of Bologna (Italy)
R Guerrieri	postdoc	2016-2018	EU Marie Curie Sklodowska Fellowships	NITRIPHILL: A novel approach to determine canopy nitrification in the phyllosphere of European forests: combining multiple isotope tracers and proteogenomic techniques	Assistant Professor, University of Bologna (Italy)
E Robert	postdoc	2016-2019	EU Marie Curie Sklodowska Fellowships	PHLOEWING: Variability in wood structure along environmental gradients in Catalonian forests	Postdoc, UAB Barcelona (Spain)
B Stocker	postdoc	2016-2018	EU Marie Curie Sklodowska Fellowships	FIBER: Understanding soil Fertility Impacts on terrestrial Biomass production in a changing EnviRonment	Scientist, WSL (Switzerland)
R. Poyatos	postdoc	2015-2016	Spanish Ministry for Education	Functional traits along complex environmental gradients	Professor, UAB Barcelona (Spain)
L. Rowland	postdoc	2012-2016	NERC	Understanding how drought affects the risk of increased mortality in tropical rain forests	Assistant Professor, University of Exeter
Y. Salmon	postdoc	2011-2015	NERC	Perilous life at the xeric edge: drought-induced tree mortality in the Mediterranean	Postdoc, University of Helsinki (Finland)
R. Clement	postdoc	2009-2015	NERC	Impacts of nitrogen deposition on the forest carbon cycle: from ecosystem manipulations to national scale predictions	Postdoc, University of Exeter (UK)
R. Guerrieri	postdoc	2009-2012	Royal Society / Newton Fellow	Assessing the contribution of canopy nitrogen uptake on $\Delta^{13}\text{C}$ , $\Delta^{18}\text{O}$ and $\Delta^{15}\text{N}$ in tree rings	Professor, University of Bologna (Italy)
T. Hölttä	postdoc	2006-2007	Finnish Academy	Xylem-phloem interactions in tall trees	Professor, University of Helsinki (Finland)
J. Martínez-Vilalta	postdoc	2002-2005	NERC	Endogenous control of age-related reductions in net primary productivity in trees	Professor, UAB Barcelona (Spain)

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L. Wingate	postdoc	2002-2005	EU	The impact of drought and manipulated rainfall on ecosystem respiration and isotopic discrimination in a montado system in Portugal	Scientist, INRA Bordeaux (France)
R. Fisher	postdoc	2005	NERC	Endogenous control of age-related reductions in net primary productivity in trees	Scientist, NCAR (USA)
M. Rayment	postdoc	1999-2002	EU	Age-related dynamics of Carbon exchange in European forests	Lecturer, University of Bangor (UK)

**iii. Visiting scientists on sabbatical in my lab:**

Fellow	Year	Institution of Provenance	Area of collaboration	Current position
William Anderegg	2019-20	University of Utah (USA)	Links between tree hydraulic functions and global forest mortality patterns	Professor at University of Utah (USA)
David Tissue	2019	University of Western Sydney	Water and carbohydrate storage in tree stems	Full Professor at University of Western Sydney.
Louis Santiago	2018	University of California at Riverside	Global patterns of plant water potentials	Full Professor at University of California at Riverside
Herve' Cochard	2007	INRA (France)	Mechanisms of development of cavitation in trees	Head of Units, INRAe, Clermont-Ferrand (France)
Dirk Vanderklein	2002	MontClair University (NJ, USA)	Age-related reductions in net primary productivity in Scots pine	Professor, Mont-Clair University (USA)

**iv. PhD students under my supervision/co-supervision**

*Current:*

Student	Year	Degree	Funding Body	Role	Predicted end of PhD	Title
Luca Da Sois	1	PhD	Spanish Ministry for Education (Spain)	First supervisor	2023	How does drought elicit acclimation across species?
Tom Ovenden	2	PhD	Scottish Forestry Trust (UK)	Co-supervisor	2023	Predicting impacts of extreme weather events on UK forests
Pablo Sánchez Martínez	1	PhD	Spanish Ministry for Education (Spain)	First supervisor	2024	Limiting factors for plant water transport at the global scale: relative roles of functional attributes, environment and phylogeny.
Roberto Silvestro	1	PhD	Université du Québec à Chicoutimi (Canada)	Co-supervisor	2024	Patterns and scales of climate change: linking plant physiology to forest ecosystem dynamics.

**v. Completed:**

Student	Year	Degree	Funding Body	Title	Current position
Teresa Rosas	2019	PhD	Spanish Ministry for Education	Predicting drought responses along environmental gradients: integrating hydraulics into the functional traits framework	Research Communication Office (UAB, Spain)
Siti Mariam Muhammad Nor	2018	PhD	Malaysian Studentship Foundation	Physiological ecology of mangrove seedlings in response to sea level rise	Lecturer University Terengganu, Malaysia
Oliver Binks	2016	PhD	NERC	The relevance of leaf hydraulic supply for the leaf economics spectrum of tropical trees	Postdoc at ANU, Australia
Sarah Wilkinson	2016	PhD	NERC	Tree mortality and species succession in Mediterranean ecosystems under drought	unknown
Michael Galante	2016	PhD	Part University of Edinburgh / part Self-funding	Reduced Impact Logging in Borneo as a tool to promote REDD-like activities	Environmental consultant, Malaysia

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Andrew Leslie	2015	PhD	University of Cumbria	Eucalyptus for short rotation forestry in the UK	Senior Lecturer at University of Cumbria
Jack Lonsdale	2015	PhD	NERC/ Forestry Commission	Prediction of carbon sequestration by UK forests: reduction of uncertainty by a model-data fusion approach	Scientific Officer, Forest Research Agency, UK
Richard Nair	2015	PhD	NERC	Interactions between atmospheric nitrogen deposition and forest carbon cycle	Post-doctoral associate, Max Planck Institute, Jena, Germany
Rachel Cohen	2014	PhD	NERC	Regional assessment of mangrove degradation and mangrove carbon stocks in East Africa	Environmental consultant at WeForests UK
Toshie Mizunuma	2013	PhD	Self-funding	Use of digital colour cameras to detect forest phenological processes	Scientific Officer, National Institute for Environmental Studies Tsukuba, Japan
Hamish McIntosh	2012	PhD	Forestry Commission/ Scottish Forestry Trust	Developing the Silviculture of Continuous Cover Forestry: using the experience and data collected from the Glentress Trial Area	Forestry Commission, UK
Kate Beauchamp	2011	Ph.D.	Forestry Commission	The biology of sapwood/heartwood transition in tree wood	Scientific Officer, Forest Research Agency, UK
Sophie Bertin	2009	Ph.D.	Torrance Bequest/Forestry Commission	Physiological ecology of understory trees and the influence of shading on needle aphid herbivory.	Independent Consultant, France
Francesco Minunno	2009	M.Res.	Italian Foundation Body	Prediction of carbon sequestration and tree growth of Sitka spruce in Scotland	Post-doctoral associate, University of Helsinki, Finland
Witness Mojeremane	2009	Ph.D.	Botswana College of Agriculture	Identification and evaluation of soil changes occurring as a result of plantation forest establishment and silvicultural transformation in the UK	Professor of Silviculture, University of Gaborone, Botswana
Evangelia Korakaki	2008	Ph.D.	Greek Foundation Body	Xylem and phloem water relations of Scots pine and poplar trees in relation to tree size	Institute of Mediterranean Forest Ecosystems, Athens, Greece
Axel Wellpott	2008	Ph.D.	Forestry Commission	Wind loading and mechanical stability of Sitka spruce trees in uneven-aged forests	Data Specialist, NERC Facility for Airborne Atmospheric Measurements, UK
Georgios Xenakis	2007	Ph.D.	Greek Foundation Body	Modelling the influence of GIS-derived environmental factors to site index prediction	Scientific Officer, Forest Research Agency, UK
Chris Russell	2007	M.Res.	Ameri-Corps studentship	Trace gas fluxes in restored mangrove forests in Gazi Bay (Kenya)	Research Assistant, University New Mexico, USA
Colin Edwards	2006	M.Res.	Forestry Commission	Physical and biological constraints to the natural expansion of native pinewoods in Scotland	Scientific Officer, Forest Research Agency, UK
Hazandy Hamid	2006	Ph.D.	Malaysian Government	Age-related declines in morphological and physiological parameters of ash and sycamore trees.	Professor, Institute of Tropical Forestry and Forest Products, Malaysia
Argyro Zerva	2004	Ph.D.	Greek Foundation Body	Effects of afforestation and forest management on soil carbon dynamics and trace gas emissions in a Sitka spruce ( <i>Picea sitchensis</i> (Bong.) Carr.) forest.	Coordinator for IPCC, Ministry Environment, Energy and Climate Change, Greece
Dimitris Zianis	2003	Ph.D.	Greek Foundation Body	The size-biomass allometry of forest trees: a global meta-analysis, novel	Greek Forestry Commission, Greece



				methods for estimating forest biomass and a case study of <i>Fagus moesiaca</i> Cz.	
Sara Strati	2002	M.Phil.	Scottish Forestry Trust	The effects of winter frost on xylem embolism and the consequences for growth and phenology across provenances of silver birch in Scotland	unknown

### Visiting Research students (registered elsewhere but working in Barcelona part of the time)

#### vi. *Present:*

Student	Year	Degree	Funding Body	Title	Current position
Beixing Duan	2021-22	PhD at Harbin University (China)	Chinese Academy of Science	Analysis of the effects of stand age on carbon stocks and fluxes in forests.	PhD student at Harbin University (China)

#### vii. *Completed:*

Student	Year	Degree	Funding Body	Title	Current position
Tong Zheng	2018-19	PhD at Harbin University (China)	Chinese Academy of Science	Effects of repeated droughts on growth resilience of trees	PhD ended
Marta Oñate Gutierrez	2012	PhD at Universidad de Barcelona (Spain)	Spanish Ministry for Education	Does senescence occur in 500-yr-old Scots pine? Answers based on hormone and anti-oxidants production.	unknown
Joseph Lang'at	2012	PhD at Napier University (UK)	Aviva plc.	The impacts of clearfelling on greenhouse gas balance and peat decomposition of Kenyan Mangroves	Research fellow, Technical University of Mombasa, Kenya
Tiziana Gentilesca	2012	PhD at Università di Potenza (Italy)	Italian Ministry for Education	Comparative analysis of the effects of fertilisation on forest carbon stocks and canopy properties across Scotland.	Post-doctoral Associate, University of Potenza, Italy
Carole Helfter	2008	PhD at Heriot-Watt University (UK)	Heriot-Watt University	A new technique for the measurement of phloem flow in trees	Scientist, Centre for Ecology and Hydrology, UK
Bernard Kirui	2007	PhD at Napier University (UK)	Leverhulme Trust	Recovery of ecosystem functions and coastal protection by replanted mangroves in Kenya	Scientist, Kenyan Marine and Fisheries Research Institute
Giai Petit	2007	PhD Università di Padova (Italy)	Italian Ministry for Education	Tapering of xylem conduits and hydraulic limitations in trees	Scientist, University of Padova, Italy
Lasse Loepfe	2006	PhD at Universidad Autónoma de Barcelona (Spain)	Catalan Ministry for Education	Applications of complex network theory to studies of xylem water flow	Post-doctoral associate, Univ. Politecnica Catalunya, Spain

#### viii. *Currently active Spanish and international collaborations (if not listed above under active grants)*

Collaborator	Year	Institution	Nature collaboration	Title	Funding Body
Martin Ventura	2021-2023	Universidad Politecnica Madrid (Spain)	Parametrization of hydraulic model using plant hydraulic traits	FORECAST: Predicting mixed <b>FO</b> rests <b>RE</b> sponses to <b>C</b> limate change <b>A</b> nd drought <b>ST</b> ress with a plant hydraulics model	Marie Curie Sklodowska fellowship
Jo Carnicer Cols & A Barbata	2020-ongoing	University of Barcelona (Spain)	Interactions between tree hydraulic properties and forest temperature increases during heatwaves	ECOHEAT. Ecophysiological determinants of forest-atmosphere feedbacks in heatwaves	Beatriu de Pinos advanced post-doctoral fellowship (Catalunya, Spain)

JJ Camarero	2018-ongoing	Istituto Pirenaico de Ecología -CSIC, Saragoza (Spain)	Analysis of tree ring responses in relation to tree hydraulic traits using global databases of tree growth	Inter-specific variability in tree growth responses to drought: a role for hydraulic traits?	FPU PhD project to Xavi Serra (Spain)
E Gil-Peigrín	2017-ongoing	Centro de Investigación y Tecnología Agroalimentaria Aragón, (Spain)	Support to local PhD students and postdocs	Comparative analyses of hydraulic properties of leaves and stems of Pinaceae and Fagaceae	INIA funding to JJ Peguero-Pina y D Sancho-Knapik (Spain)
Kathy Steppe DENDRO-GLOBAL network	2020	University of Ghent (Belgium)	Global synthesis / meta-analysis	Analysis of global dendrometric datasets; design of statistical analyses	Partly funded via EFI (European Forest Institute)
P Meir	2000-ongoing	Australian National University (Australia)	Collaborator on grant	Impact of drought stress on tropical forest structure and function	ARC (Australia)
S Rossi	2018-ongoing	University of Quebec in Chicoutimi (Canada)	Collaborator on grant and member of PhD Supervisory Committee	Linking xylem production phenology with ecosystem-scale carbon fluxes	Fondation de l'Université du Québec à Chicoutimi PhD to Roberto Silvestro (Canada)
D Galbraith	2017-ongoing	Leeds (UK)	Collaborator on grant, Field campaigns, co-supervision of two PhD students	Biogeographical patterns of tropical forest vulnerability to drought stress	NERC
P Cox / S Sitch	2018-ongoing	Exeter (UK)	Collaborator on grant, co-supervision of post-doctoral associate	Implementing information of plant hydraulic systems in JULES (a global terrestrial biosphere model)	Met Office funding to post-doctoral associate C Eller (UK)
K Dexter	2018-ongoing	Edinburgh (UK)	Global synthesis / co-supervision of PhD project	Global phylogenetic patterns in the evolution of plant hydraulic traits	FPU PhD project to Pablo Martinez (Spain)
N McDowell	2020	Pacific National Laboratory (USA)	Co-supervision of post-doctoral associate	Functional traits controlling plant responses to height	Marie-Curie Fellowship (Laura Fernandez Uña)
B Christoffersen	2017-ongoing	Texas Uni (USA)	Informal collaboration	Modelling of water transport and storage in trees	Partly funded by Keck Institute at Caltech, California, USA

## **10. Past teaching experience**

- At the University of Edinburgh, I organised and taught several modules at undergraduate (*Woodland Management, Professional Skills, Ecological and Environmental Analysis, Principles of Ecology, Applied Ecology and Environmental Management, Forest Ecosystems, Forest Tree Species, Forest Stand Development*) and MSc level (*Forest Ecosystems, Forests and the Environment*), including field courses (*Ecology Field Course, Research Practice in Forest Ecology, MSc Forest GeoSciences field course*).
- Currently, I do not teach in any module in Spanish or other Universities elsewhere.

## **11. University administrative experience**

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- At the University of Edinburgh, I was Programme Convenor for the BSc (Hons.) Ecological Science, BSc (Hons.) Ecological and Environmental Sciences and BSc (Hons.) Ecological and Environmental Sciences with Management. (about 120 students, 10 members of staff) (2008-2012).
- Programme Director for MSc Forest Ecology and Management (2004-2006).
- I successfully led the quinquennial Teaching Programme Review for Ecological Science in 2010-11. The review specifically commended the Programme Convenor for the leadership shown in the proactive approach taken in re-shaping the BSc. degree.
- I led the creation of a new Degree Programme (BSc (Hons.) Ecological and Environmental Science), launched in 2011.

## **12. Membership of academic societies**

- Member, British Ecological Society (UK), Ecological Society of America (USA), Botanical Society of America (USA), Society of Experimental Biology (UK), Institute of Chartered Foresters (UK), Società Italiana di Selvicoltura ed Ecologia Forestale (Italy).

## **13. Development of research tools and methods**

- Routines for the modelling of hydraulic traits.** I have contributed substantially to developing a novel approach based on optimality theory to describe the photosynthetic behaviour of leaf stomata as a function of plant hydraulic traits, while accounting for the shadow cost of potential water-stress induced cavitation. The initial optimality model (Sperry et al 2017, cf., the reference list) has now been implemented in several mechanistic mathematical models (e.g., MedFate, for the Mediterranean basin, De Caceres et al., 2020). For one of those (the UK JULES simulator, one of the leading global terrestrial biosphere models), I have contributed significantly to the implementation and subsequent testing and validation of the relevant routines, for the Amazon (Eller et al., 2018) and globally (Eller et al., 2020). Further testing work is currently ongoing at global scale.
- Theory and modelling of high-resolution measurements of tree stem diameter.** I have developed the theory and the practical application of a mechanistic model allowing to separate irreversible stem diameter growth, reversible dynamics due to water storage and reversible changes in osmotic concentrations of the bark (Mencuccini et al., 2015; Chan et al., 2016; Mencuccini et al., 2017). The method has been employed in various countries around the world (Brazil, Spain, Switzerland, Australia, Finland, USA). Its fundamental equations have now been incorporated in a more advanced model of stem water and carbon balance (Solomon et al 2020).
- Method for the identification of nitrification processes in tree canopies using stable isotopes.** I have led the development of an isotopic approach based on the combination of  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$  and  $\Delta^{17}\text{O}$  isotopes of nitrates in waters to identify whether nitrification occurs in tree canopies. This has led to the first quantification of the occurrence of this process (widely known to occur in soils) also inside

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tree canopies (Guerrieri et al., 2015). We have recently confirmed the evidence and expanded this isotopic approach to include evidence of canopy nitrifying activity based on meta-barcoding and quantitative polymerase chain reaction of the relevant functional genes (Guerrieri et al., 2020).

#### **14. Professional Contribution outside the University:**

##### **i. Currently active scientific editorial work**

- Editor, *Annals of Forest Science* (2021-ongoing).
- Editor, *Plant Ecology and Diversity* (2020-ongoing).
- Specialty Chief Editor for Temperate and Boreal Forests, *Frontiers in Forests and Global Change* (2018-ongoing).
- Sub-Editor for Physiological Processes, *Current Forestry Reports* (2016-ongoing).
- Editor, *Tree Physiology* (2013-ongoing).
- Advisory Review Board, *iForest- Biogeosciences and Forestry* (2012-ongoing).
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##### **ii. Past scientific editorial work**

- Review Editor, *Frontiers in Plant Biophysics and Modeling* (2015-2017).
- Editor, *Forests* (2017-18).
- Editor, *PeerJ* (2017-18).
- Guest Editor, *Forestry*. Special Issue on *Managing Spruce Forests for Ecosystem Services*, 2014.
- Guest Editor, *Plant Ecology and Diversity*. Special Issue on *Forests and Atmosphere*, 2013.
- Member, Editorial Advisory Board of the journal *Forest Ecology and Management*, 1997-2009.

##### **iii. Conference organisation**

- Member, Scientific Committee of 9<sup>th</sup> International Workshop on Sap Flow, Gent, Belgium (4-7 June 2013).
- Chair of the Scientific Committee and Conference Organising Committee, IUFRO meeting – Working Party 1.01.08. International forestry conference *Managing Spruce Forests for Ecosystem Services*, Scotland 2012.
- Chair, Conference Organising Committee, *Forests and the Environment*. International Conference – Bologna, Italy; 18-19 April 2011.
- Member, Conference Organising Committee, *Natural disturbances and natural hazards in mountain forests. Challenges and opportunities for silviculture*. International IUFRO conference – Trento, Italy; 18-21 September 2007.
- Organiser, ESF-funded Workshop: Methods for the detection of changes in soil carbon stocks under climate change, Edinburgh, 29-31 October 2003.
- Co-organiser, Workshop: Water Transport in Woody Plants and Linkages to Plant Structure and Productivity. 14-16 March 2001, Helsinki (Finland), 2001.

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- Co-organiser, Conference: Forests at the Land-Atmosphere Interface. 17-19 September 2001, Edinburgh (UK) 2001. Senior Editor of subsequent Conference Proceedings, published in book edited by CABInternational.
- Organiser, Workshop: CARBO-AGE: progress, plans and relationships with other chronosequence studies. 22-25 November 2000, Edinburgh (UK) 2000.

#### **iv. Currently active panel Evaluation work**

- Member, Scientific Review Panel, Newton International Fellowships, Royal Society of London, London (UK), 2017-2022. Selection at post-doctoral level.
- Member, Scientific Review Panel, La Caixa Bank Junior Leader Fellowship Retaining, Barcelona (Spain), 2020-21. Selection at post-doctoral level.
- Member, Scientific Review Panel, DEVA Andalusian Agency for Knowledge, Andalusian regional Government, Sevilla (Spain), 2019-ongoing. Selection at junior-professorial level.
- Member, Scientific Review Panel, Agencia Estatal de Investigación (Spain), 2019-ongoing. Selection at post-doctoral level.

#### **v. Past panel Evaluation work**

- External Referee for the Italian Research Assessment Exercise 2015-2019 (conducted by the Italian National Agency for the Evaluation of Universities and Research Institutes ANVUR), 2021.
- President, Selection Committee, National Research Council of Italy CNR (Italy), 2017-8. Selection Committee for the position of Dirigente di Ricerca (equivalent to full Professorship) in the area Bio and Agri-Food Sciences, Rome, 2017-18.
- Member, Selection Committee for the Professorship in Interactions between Forests and Atmosphere, Department of Forest Science, University of Helsinki, 2016.
- Member, Scientific Review Panel, National Research Council of Italy CNR (Italy), 2015-6. I was a member of one of the seven panels, called upon by the Italian Ministry to examine the scientific outputs and achievements of all the research institutes belonging to CNR (we worked on Bio and Agri-Food Sciences i.e., broadly Agriculture and Forestry). The exercise is broadly equivalent to the British Research Assessment Framework. CNR consists of 109 Institutes distributed throughout Italy, with 8,000 employees and an annual budget of > 1,008 M € in 2011, making it the largest public interdisciplinary research network of Italy. It involves three field visits and the writing of two reports to the CNR Director, examining the work of 12 research institutes.
- External Referee for the Italian Research proposals (PRIN program) 2015-2019.
- Member, Selection Committee for the Professorship in Interactions between Forests and Atmosphere, Department of Forest Science, University of Helsinki, 2013.
- Reviewer of proposals for Research Councils: ERC (2016), NERC (2000, 2001, 2005-6), Austrian RC (2002, 2005, 2007, 2011), Australian RC (2001), Canadian CFCAS (2005-6), US NSF (2005-6, 2009,

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2011, 2012, 2016), US DoE (2005, 2013), Italian Ministry of Education, University and Research (MIUR) (2012).

- Member, Soil Expert Group (composed of five people) for the Woodland Carbon Task Force (Woodland Carbon Code, Forestry Commission), 2009-2010. This expert group was convened by Forestry Commission to draft the code that is now the national standard for voluntary forestry and woodland carbon sequestration projects that incorporate core principles of good carbon management. It is addressed to project developers/owners and provides a methodology to account for changes in biomass and soil carbon as a result of woodland creation projects. The code of practice has been linked to the Woodland Carbon CO<sub>2</sub>e certification scheme (<http://www.forestry.gov.uk/carboncode>). There are currently 58 projects either validated or waiting to be validated, for a total of 2,700 ha and a projected sequestration of about 1.2 million tCO<sub>2</sub>e over the project lifetime.
- Expert reviewer for the *Read Report* for Forestry Commission. The Read Report, published in 2009, is the key policy reference on the role of forests in the carbon cycle for the British forestry world. It assessed the potential of the UK's trees and woodlands to mitigate and adapt to our changing climate. I have contributed to the report by internally reviewing key chapters for the Forestry Commission (<http://www.forestry.gov.uk/readreport>).
- Member, External Review Panel, Mach Foundation (TN, Italy), 2008. I was a member of a restricted panel (10 people) called to examine the scientific impact of the research programme of the Kessler and Mach Foundations, a major regional research centre (Trento, Italy). I concentrated on the ecological and agricultural research, which consists of six departments, 280 people and an annual budget of about 38 million euros in 2007. It involved two field visits, about ~20 interviews with department directors and scientists and the writing of an extensive final report to the Province (<http://www.uniricerca.provincia.tn.it/> and click on *Rapporto CVR 2006-2008 (Allegato 2): Evaluation of the impact of the activities on the provincial system in Trentino 2005-2007*).
- Member, Steering Committee for UK LULUCF (Land Use, Land Use Change and Forestry) (composed of 7-8 people), 2007-2011. The committee oversaw the activities carried out under UNCCC (United Nation Convention on Climate Change) programme to develop methodologies for reporting to IPCC (Inter-Governmental Panel on Climate Change) for UK-level greenhouse gas emissions under land use, land use change and forestry.
- Member, NERC Peer Review College (2005-2008).
- External Reviewer for the Irish project CARBiFOR (2002). I was invited by COFORD (Irish Research Council for Forest Research) to conduct a mid-term assessment of the quality and impact of a major nationally-funded research programme on the carbon sequestration of Irish forests.

## vi. European COST Actions

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- British representative to COST FP1106 *Studying Tree Responses to extreme Events: a Synthesis (STRESS)*, 2012-2015.
- British representative to COST E639 *Greenhouse gas budget of soils under changing climate and land use (BurnOut)*, 2007-2010. The action has been very influential in bringing together European experts on the impacts of afforestation projects on soil C sequestration. A meta-analysis of such projects has been undertaken and a review paper is on-going. I initiated this multinational effort; in addition, I coordinate the British inputs into this action and to provide the relevant datasets for analysis.
- British representative to COST E21 *Contribution of forests and forestry to the mitigation of greenhouse effects*, 2003-2006. My major contribution here was to initiate a consolidation and a review of all the forestry biomass equations existing in Europe for the estimation of forest carbon stocks. One of my PhD students (D Zianis) worked on this project, which resulted in a publication of 'service' to the international community. The resulting database is permanently housed, maintained and updated by the European Forestry Institute in Finland. The publication is frequently cited by the community (including IPCC reports) as a standard of reference for the allometry of forest tree species in Europe.

#### vii. Engagement activities / Outreach

- Training school on eco-physiological instrumentations (Portugal, September 2012, 2014). For a number of years, I took part in a highly-successful and well-known training school for PhD students and post-doctoral associates working in the area of plant physiological ecology. This is jointly organised by the British Ecological Society and Society of Experimental Botany. It is a periodic event whose organization I personally led once in the early 2000s attended by about 60 students.

#### 15. International symposia, workshops and congresses (talk titles in bold underlined have estimated audience size in excess of 100).

- **Invited Workshop.** *Key Hydraulic Traits and their Representation at the Global Scale.* Workshop *Sensing Forest Water Dynamics from Space*, Keck Institute for Space Studies – California Institute of Technology, Oct 14-18, **2020**.
- **Invited Workshop.** *Canopy Water Content and its Estimation from Space.* Workshop *Sensing Forest Water Dynamics from Space*, Keck Institute for Space Studies – California Institute of Technology, May 12-16, **2020**.
- **Keynote Speaker.** **Forest responses to drought: from tissues to biosphere.** The 13<sup>rd</sup> Conference du CEF, Centre d'étude de la forêt, Chicoutimi, Quebec (Canada), May 1-3, **2019** (oral presentation, audience of ~200).
- **Invited Speaker.** *Plasticity, acclimation and short-term regulation in hydraulics.* Symposium *Drought, Plant Hydraulic Traits and Vegetation Modeling*, Wageningen, Sept 3-5, **2018** (oral presentation).
- **Keynote Speaker.** **"Plasticity, acclimation and short-term regulation in hydraulics"**. Symposium *Shaping future forests - understanding tree responses to extreme climate events*, Berlin, Apr 12-14, **2016** (audience of ~200).
- **Invited Talk.** *Drought vulnerability of tropical trees: evidence from the long-term throughfall exclusion experiment of Cauxiana (Para', Brazil).* Santa Fe, New Mexico, Oct **2015** (audience of ~100).
- **Keynote Speaker.** **"Forest functional responses to drought: phenotypic versus ecotypic responses"**. In: *Xylem International Meeting*, Bordeaux (France), Sept 7-9, **2015** (audience of ~200).

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- **Keynote Speaker.** “Forest functional responses to drought risks and management implications”. In: II International Conference of Silviculture. *Designing the Future of the Forestry Sector*. Florence (Italy) 26-29 Nov **2014**, Italian Academy of Forest Sciences (Florence, Italy) (Audience of ~50).
- **Invited Talk.** In: “Plant Environmental Physiology: Eco-physiology Techniques Workshop”. British Ecological Society, Society for Experimental Biology, Lisbon (Portugal), Sept 8-15, **2014** (audience of ~100; repeat of 2012 event)
- **Keynote Speaker.** "**Modelling and monitoring of tree bark turgor in transport phloem**". In: *Symposium on Phloem Physiology and Ecology*, 99th ESA Annual Meeting, Sacramento (CA, USA), Aug 11-16, **2014** (audience of ~200).
- **Invited Talk.** "The significance of carbon cycle research for forest management". In: “*Research and Innovation in sustainable forestry to support the global bio-economy*”. Agricultural Research Council / Forestry Research Centre (Italy), March 26, **2014**. (audience of ~200).
- Invited Talk. In: “Plant Environmental Physiology: Eco-physiology Techniques Workshop”. British Ecological Society, Society for Experimental Biology, Lisbon (Portugal), Sept 10-15, **2012** (audience of ~50)
- **Invited Talk.** In: “Life on Earth: Preserving, Utilizing and Sustaining our Ecosystems”. Ecological Society of America Annual Meeting, Portland (OR, USA), Aug 5-10, **2012** (audience of ~200)
- Invited Talk. In: New Phytologist Workshop on Forest Mortality, Sponsored by: New Phytologist Trust and Los Alamos National Lab, Los Alamos, Nov 1-3, **2011** (audience of ~50).
- Invited Talk. GREENCYCLESII Summer School, "*Feedbacks in the Earth System: the state-of-the-art*" (European FP7 Marie Curie Initial Training Network), Peyresq, French Alps, 16-25 May **2011** (audience of ~30).
- Invited Talk. Conference: Forests and the Environment, Bologna, April 18-19, **2011** (audience of ~70).
- Invited Talk International workshop - Working Group 1: Modeling Plant Functioning, TERRABITES - COST ES0805: The Terrestrial Biosphere in the Earth System, Avignon, France, March, 7-8, **2011**. (audience of ~20).
- **Keynote Speaker.** In Sir Mark Oliphant Conference: "**Canopy processes in a changing climate**", International Union of Forest Research Organizations, (various sites, South East Australia), Oct 7-15, **2010** (audience of ~120).
- Invited Talk. In International Conference: Forests and Climate Change, British Council: UK-Japan Collaboration, British Embassy, Kyoto, Aug 25-27, **2010** (audience of ~40).
- Invited Seminar. Kenyan Marine and Fisheries Research Institute, Mombasa, Kenya, Jul 15, **2010** (audience of ~40).
- Invited Talk. In International Conference “Agricultural and Forest Systems as Sinks of Greenhouse Gases”. National Institute for Agricultural and Food Research and Technology, Madrid, Jun 15-17, **2010** (audience of ~40).
- Invited Seminar. CNRS-CEFE, Montpellier, Mar 15, **2010** (audience of ~30).
- **Keynote.** In Workshop: Tropical Forest Restoration and Payments for Ecosystem Services, final meeting of the NERC-funded CAMARV project, Mombasa (Kenya), Jul 21, **2009** (audience of ~200).
- Invited Seminar. University of Helsinki (Finland), 15 Apr, **2009** (audience of ~20).
- **Invited Talk.** Conference, Carbon-Nitrogen Interactions in Forest Ecosystems. Stockholm, Feb 26, **2009** (audience of ~200).
- Invited Seminar. Workshop, COST Action 639, University of Asa, Sweden, Nov 26, **2008** (audience of ~60).
- Invited Talk. In Workshop: Coastal African Forests: Ecology, Management and Restoration, Mombasa (Kenya), Jul 10, **2008** (audience of ~40).
- Invited Seminar. Workshop Functional -Structural models of Tree Growth, INRA Bordeaux, Biarritz, Nov 28, **2007** (audience of ~40).
- **Keynote.** In: La Selvicoltura Italiana nel Secondo Millennio: Sfide Ecologiche e di Gestione, Arezzo (Italy) Sept 27, **2007** (audience of ~300).
- Invited Talk. In 6<sup>th</sup> International Workshop on *Measuring Xylem Sap Flow and its Application to Plant Sciences*, Perth, Nov 27-30, **2006** (New South Wales, Australia) (audience of ~60).



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- **Keynote.** In Conference "Regional Forest Responses to Environmental Change", International Union of Forest Research Organizations Canopy Processes Working Group, Oct 6-13, **2006** (Northeastern USA) (audience of ~100).
- **Invited Talk.** International Canopy Conference, 10-17 Jul, **2005**, Leipzig, Germany (audience of ~120).
- **Invited Seminar.** Ecological Society of America Annual Meeting, 2-10 Aug, **2005**, Montreal, Canada (audience of ~120).
- **Invited Seminar.** COST E21 6<sup>th</sup> final plenary meeting, University College, Dublin (Ireland), Oct 6-9, **2004** (audience of ~80).
- **Invited Seminar.** In: Carbon balance of Forest Biomes: Society of Experimental Biology Annual General Meeting, Southampton, UK, 31 Mar-4 Apr **2003** (audience of ~150).
- **Invited Seminar.** In: 'Allometry of trees, development of Biomass Expansion Factors and biomass C stock estimates'. COST E21 4<sup>th</sup> whole action meeting, Centro De Estudios Ambientales Del Mediterráneo, Valencia (Spain), Oct 7-8, **2002** (audience of ~40).
- **Invited Talk.** In: Water Transport in Woody Plants and Linkages to Plant Structure and Productivity, 14-16 Mar **2001**, Helsinki (Finland) (audience of ~40).
- **Keynote.** In: Development and Ageing in Forest Trees. Florence (Italy), Sept **2000**, EUROSILVA Forest tree Physiology Workshop (audience of ~200).
- **Invited Talk.** In: 5<sup>th</sup> International Workshop on Measuring Sap Flow in Intact Plants. Florence (Italy), 09-10 Nov **2000** (audience of ~40).

**16. National invitations such as: invited papers at UK or Spanish based groups' meetings; invitations to give talks at UK or Spanish universities and research groups and laboratories.**

- **Invited Speaker.** *Forests and climate change: from tree physiological mechanisms to global scale processes*, DISTAL, University of Bologna, Dec 18, **2019** (audience of ~40).
- **Invited Talk.** "*Water use strategies by woody plants. Safety, efficiency and whole-plant economics*". School of Geography (Oxford, UK), Apr 28, **2017** (audience of ~40)
- **Invited Talk.** "*Water use strategies by woody plants. Safety, efficiency and whole-plant economics*". Geography (Exeter, UK), Mar 15, **2017** (audience of ~20)
- **Invited Talk.** "*Water use strategies by woody plants. Safety, efficiency and whole-plant economics*". School of Geography (Leeds, UK), Mar 13, **2017** (audience of ~20)
- **Invited Talk.** *Current and future drought impacts on water use by tropical rainforests: from plasticity and diversity to watershed water balance.* Centre d'Estudis Avançats de Blanes, Blanes Societat Catalana de Biologia, CEAB i GECA. Nov 11, **2016** (audience of ~80).
- **Invited Talk.** *Plasticity in the water relations of tropical rainforest trees.* III Encuentro de la Red Española de Biología Tropical, Barcelona. Oct 27-28, **2016** (audience of ~50).
- **Invited Seminar.** *Detection and attribution of drought-induced tree mortality.* University of Cordoba (Spain), June 29, **2015** (audience of ~50).
- **Invited Talk.** Conference Jornadas Sobre Bosques y Cambio Global. Barcelona, 3-5 November **2010** (audience of ~120)
- **Invited Talk.** In: Workshop on Forests, Biodiversity and Global Change, Barcelona, Sept 25, **2009** (audience of ~80).
- **Keynote.** Conference on The Impact of Radiation Conditions on Natural Regeneration of Forests, Continuous Cover Forestry Group, Cirencester, Sept 30, **2009** (audience of ~80).
- **Invited Seminar.** University of Durham, Durham, Mar 15, **2008** (audience of ~20).
- **Invited Seminar.** University of Newcastle, Newcastle, Mar 15, **2008** (audience of ~20).
- **Invited Seminar.** CREAM, Barcelona, Oct 31, **2007** (audience of ~20).
- **Invited Seminar.** Forestry Commission, Northern research Station, Bush Estate, Feb 24, **2004** (audience of ~20).
- **Invited Seminar.** SUERC, Scottish University Environment Research Centre, East Kilbride, Nov 18, **2003** (audience of ~20).
- **Keynote.** In: Trees 2000, Keele University (UK), Jun **2000**, Institute of Chartered Foresters (audience of ~150).

### **17. Appointments as external examiner for the award of doctoral degrees**

- 2020, University of Oxford (UK): PhD thesis (Nicolas Raab)
- 2020, Universitat Autònoma de Barcelona (Spain): PhD thesis (Antoine Cabon)
- 2019, Hebrew University of Jerusalem (Israel): PhD thesis (Israel Oren)
- 2019, Universidad de Barcelona (Spain): PhD thesis (Alba Cotado)
- 2019, University College Dublin (Ireland): PhD thesis (Susan Foreman)
- 2018, Universidad de Córdoba (Spain): PhD thesis (Francisco José Ruiz Gómez)
- 2018, University of Leeds (UK): MRes thesis (Liam Caldwell)
- 2016, Universidad Politécnica de Madrid (Spain): PhD thesis (María D. Fernández-Caballero Fariñas)
- 2016, ETH Zurich (Switzerland): PhD thesis (Christoph Banhofen)
- 2016, Universitat Autònoma de Barcelona (Spain): PhD thesis (Nuria Garcia Fornet)
- 2015, Universidad de Barcelona (Spain): PhD thesis (Melanie Morales Fernandez)
- 2015, Universitat Autònoma de Barcelona (Spain): PhD thesis (Josep Barba)
- 2014, Universidad de Barcelona (Spain): PhD thesis (Marta Juvany)
- 2014, Macquarie University (Australia): PhD thesis
- 2013, University College, Dublin (Ireland): PhD thesis
- 2012, University of Padova (Italy): PhD thesis
- 2012, University of Barcelona (Spain): PhD thesis (Marta Onate Gutierrez)
- 2012, Trinity College, Dublin (Ireland): PhD thesis
- 2011, University College York (Ireland): PhD thesis
- 2010, University of Oxford (UK): PhD thesis (Royd Vinya)
- 2009, University of Barcelona (Spain): PhD thesis
- 2007, University of Manchester (UK): PhD thesis (Karen Christensen)
- 2004, University of Cambridge (UK): PhD thesis.
- 2003, University of Padova (Italy): PhD thesis.
- 2000, University of Melbourne (Australia): PhD thesis.

### **18. Invited Scientific Reviews**

- **MENCUCCINI M, MANZONI S, CHRISTOFFERSEN B, 2019.** Modelling water fluxes in plants: from tissues to biosphere and back. *New Phytologist Tansley Review*, 222: 1207-1222.
- **MCDOWELL NG et al. (includ. MENCUCCINI M), 2018.** Drivers and mechanisms of tree mortality in moist tropical forests. *New Phytologist Tansley Review*, 219: 851-869.
- **SAVAGE JA, CLEARWATER M, HAINES D, KLEIN T, MENCUCCINI M, SEVANTO S, TURGEON R, ZHANG C, 2016.** Allocation, stress tolerance and carbon transport in plants: How does phloem physiology affect plant ecology? *Plant, Cell & Environment Review*, 39: 709-725.
- **MEIR P, MENCUCCINI M, DEWAR R, 2015.** Drought-related tree mortality: addressing the gaps in understanding and prediction. *New Phytologist (Tansley Insight Paper)*, 207: 28-33.
- **PFAUTSCH S, HÖLTTÄ T, MENCUCCINI M, 2015.** Radial Transfer – a Key Mechanism for Whole-Tree Hydraulic functioning of tree stems – fusing ray anatomy, radial transfer and capacitance. *Tree Physiology Review*, 35: 706-722.
- **MCDOWELL NG et al. (includ. MENCUCCINI M), 2013.** Evaluating theories of drought-induced vegetation mortality using a multimodel–experiment framework. *New Phytologist Tansley Review* **200**: 304–321.
- **MENCUCCINI M., 2003.** The ecological significance of long-distance water transport: short-term regulation and long-term acclimation across plant growth forms. *Plant, Cell and Environment Review*, 26:163-182.

### **19. Refereeing Work**

- Average of about 20-25 reviews/year, from amongst the following journals: *Nature, Science, Nature Climate Change, Nature Plants, PNAS, Ecology Letters, Methods Ecology & Evolution, American Journal of Botany, Annals of Botany, Australian Journal of Plant Physiology, Journal of Geophysical Research - Biogeosciences, Brazilian Journal of Plant Physiology, Canadian Journal of Forest Research, Dendrochronologia, Ecological Applications, Ecology, Folia Geobotanica, Forest Ecology and Management, Forestry, Functional Plant Biology, Functional Ecology, Global Change Biology, IAWA Journal, Journal of Ecology, Journal of Experimental Botany, New Phytologist, Oecologia, Physiologia Plantarum, Plant Biosystems, Plants and Soil, Plant Cell and Environment, Plant Physiology, Tree Physiology, Trees.*

**B. List of Publications (first authors underlined are current or former PhD students or postdocs):**

**Date: December 2020**

**Highlights: Google Scholar h-index: 64**

**Thomson ISI (ResearcherID B-9052-2011) h-index: 51**

**ResearchGate h-index: 61**

**Total number of citations: > 17,000 (Google Scholar)**

**Summary:** total > 220 papers, either published or in press (~180 in peer-reviewed journals, ~30 in books, conference proceedings, etc.). About 60 papers published in journals with impact factor > 5. More than 40 articles with >100 citations (Google Scholar). Three letters in *Nature* (Rowland et al., 2015; Choat et al., 2012; Magnani et al., 2007), three in *Nature Ecology & Evolution* (Adams et al., 2017, Bruelheide et al, 2018, Zheng et al 2021), one in *Nature Communications*, one in *PNAS* (Wingate et al., in 2009), two News and Views in *Nature Climate Change* (both 2015), three in *Ecology Letters* (Impact Factor>17), one of which reviewed in both *Science* and *Nature* (Mencuccini et al., 2005). Reviews/ commentaries on our articles published on various journals (i.e., *New Phytologist* in 2019 and 2020; *Plant, Cell and Environment* in 2015, *Nature* in 2012, *New Phytologist* in 2010; *New Phytologist* in 2009). Four articles (Rowland et al., 2015; Choat et al., 2012; Mencuccini & Hölttä 2010; Magnani et al., 2007) evaluated in Faculty of 1000 (<http://f1000.com/>).

**Books / Special Issues edited**

- 1) **MENCUCINI M**, MASON B, (Editors) 2014. Managing Spruce Forests for Ecosystem Services. *Themed Issue of Forestry*, volume 87.
- 2) **MENCUCINI M**, MEIR P., WILLIAMS M, (Editors) 2013. *John Grace Festschrift -Forests and the Environment*, 200 pp., Special Issue of *Plant Ecology and Diversity*. Taylor and Francis, Volume 6 (Issue 1).
- 3) **MENCUCINI M**, J MONCRIEFF, K MCNAUGHTON AND J GRACE (Editors) 2004. *Forests at the Land–Atmosphere Interface*, 304 pp., CABI Publishing, Wallingford, Oxfordshire (UK). ISBN 0-85199-677-9.

**Peer-reviewed material**

**Articles published as sole author (Two stars at the end mark a major contribution)**

- 4) **MENCUCINI M**, 2003. The ecological significance of long-distance water transport: short-term regulation and long-term acclimation across plant growth forms. *Plant, Cell and Environment*, 26:163-182.
- 5) **MENCUCINI M**, 2002. Hydraulic constraints in the functional scaling of trees. *Tree Physiology*, 22:553-565.

**Short Commentaries**

- 6) ROWLAND L, MARTÍNEZ-VILALTA J, **MENCUCINI M**, 2021. Hard times for high expectations from hydraulics: predicting drought-induced forest mortality at landscape scales remains a challenge. *New Phytologist*, 230: 1685-87.
- 7) MEIR P, **MENCUCINI M**, SI COUGHLIN SI, 2020. Respiration in wood: integrating tissues, functions and scale. *New Phytologist*, 225: 1824-1827.
- 8) **MENCUCINI M**, BINKS O, 2015. Tall leafy conifers lose out. *Nature Climate Change*, 5: 1-2.
- 9) STEPPE K, VANDEGEHUCHTE M, TOGNETTI R, **MENCUCINI M**, 2015. Sap flow as a key trait in the understanding of plant hydraulic functioning. *Tree Physiology*, 35: 341-345.
- 10) MASON B, **MENCUCINI M**, 2014. Managing forests for ecosystem services – can spruce forests show the way? *Forestry*, 87: 189-191.
- 11) **MENCUCINI M**, 2014. Dwarf trees, super-sized shrubs and scaling: why is plant stature so important? *Plant, Cell and Environment*, 38: 1-3.
- 12) **MENCUCINI M**, 2014. Temporal scales for the co-ordination of tree carbon and water economies during droughts. *Tree Physiology*, 34: 439-442.
- 13) SALA A, **MENCUCINI M**, 2014. Plump trees win under drought. *Nature Climate Change* 4: 666-667.
- 14) MEIR P, **MENCUCINI M**, WILLIAMS M, MAGNANI F, 2013. Forests, instruments and ideas’ – a tribute to John Grace's career. *Plant Ecology & Diversity* 6: 1-4.
- 15) **MENCUCINI M**, 2013. Paul Jarvis, FRS, FRSE: Plant ecologist who showed the link between forests and the atmosphere. *Iforest- Biogeosciences and Forestry*, 6: 100-101.

**Joint articles published (A senior author underlined is/was either a PhD student or a postdoctoral associate in my laboratory)**

- 16) KONINGS A and other 35 authors (incl. **M MENCUCINI**), 2021. Detecting forest response to droughts with global observations of vegetation water content. *Global Change Biology*, in press, GCB-21-1442.

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- 17) GILES AL, ROWLAND L, BITTENCOURT PRL, BARTHOLOMEW DC, COUGHLIN I, COSTA PB, DOMINGUES T, MIATTO RC, BARROS FV, FERREIRA LV, GROENENDIJK P, OLIVEIRA AAR, DA COSTA ACL, MEIR P, **MENCUCINI M**, OLIVEIRA RS, 2021. Small understorey trees have greater capacity than canopy trees to adjust hydraulic traits following prolonged drought in a tropical forest. *Tree Physiology*, TP-2021-150, in press.
- 18) ROSAS T, **MENCUCINI M**, BATILLES C, REGALADO I, SAURA-MAS S, STERCK F, MARTÍNEZ-VILALTA J, 2021. Are leaf, stem and hydraulic traits good predictors of individual tree growth? *Functional Ecology* FE-2020-01402, doi: 10.1111/1365-2435.13906.
- 19) MARTÍNEZ-VILALTA J, SANTIAGO L, POYATOS R, BADIELLA L, DE CÁCERES M, ARANDA I, DELZON S, VILAGROSA A, **MENCUCINI M**, 2021. Towards a statistically robust determination of minimum leaf water potential and hydraulic risk in plants. *New Phytologist*, in doi: 10.1111/nph.17571.
- 20) BRYANT CJ, FUENZALIDA T, BROTHERS N, MENCUCINI M, SACK L, BINKS O, BALL MC, 2021. Shifting access to pools of shoot water sustain gas exchange and increases stem hydraulic safety during seasonal atmospheric drought. *Plant, Cell & Environment*, 44: 2898-2911.
- 21) COOPMAN RE, NGUYEN HT, **MENCUCINI M**, OLIVEIRA RS, SACK L, LOVELOCK CE, BALL MV, 2021. Harvesting water from unsaturated atmospheres: deliquescence of salt secreted onto leaf surfaces drives reverse sap flow in a dominant arid climate mangrove, *Avicennia marina*. *New Phytologist*, 231: 1401-1414.
- 22) FLO V, MARTÍNEZ-VILALTA J, **MENCUCINI M**, GRANDA V, ANDEREGG W, POYATOS R. 2021. Climate and functional traits jointly mediate tree water use strategies. *New Phytologist*, 231: 617–630.
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- 24) POYATOS R, GRANDA V, FLO V, **MENCUCINI M**, MARTÍNEZ-VILALTA J, et al. 2021. Global transpiration data from sap flow measurements: the SAPFLUXNET database. *Earth System Science Data*, 13: 2607-2649.
- 25) OVENDEN TS, PERKS MP, CLARKE T-K, **MENCUCINI M**, JUMP AS, 2021. Life after recovery: increased resolution of forest resilience assessment sheds new light on post-drought compensatory growth and recovery dynamics. *Journal of Ecology*, 10.1111/1365-2745.13576.
- 26) ZHENG T, MARTÍNEZ-VILALTA J, GARCÍA-VALDÉS R, GAZOLA, CAMARERO JJ, **MENCUCINI M**, 2021. Disentangling biology from mathematical necessity in 20th Century gymnosperm resilience trends. *Nature Ecology and Evolution*, 4: 1075-1083.
- 27) SIGNORI-MÜLLER C and other 39 authors (incl. **M MENCUCINI**), 2021. Non-structural carbohydrates mediate seasonal water stress across Amazon forests. *Nature Communications*, 12: 2310.
- 28) BINKS O, FINNIGAN J, COUGHLIN I, DISNEY M, CALDERS K, BURT A, BONI VICARI M, LOLA DA COSTA A, **MENCUCINI M**, MEIR P, 2021. Canopy wetness in the Eastern Amazon. *Agricultural and Forest Meteorology*, 297: 108250.
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- 41) ELLER CB, ROWLAND L, **MENCUCINI M**, ROSAS T, MEDLYN B, WILLIAMS K, HARPER A, WAGNER Y, KLEIN T, TEODORO GS, OLIVEIRA RS, MATOS IS, ROSADO BHP, FUCHS K, WOHLFAHRT G, MONTAGNANI L, MEIR P, SITCH S, COX P, 2020. Stomatal optimisation based on xylem hydraulics (SOX) improves land surface model simulation of vegetation responses to climate. *New Phytologist*, 226: 1622-1637.
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- 46) **MENCUCINI M**, ROSAS T, ROWLAND L, CHOAT B, CORNELISSEN JHC, JANSEN S, KRAMER K, LEPENAS A, MANZONI S, NIINEMETS U, REICH P, SCHRODT F, SOUDZILOVSKAIA NA, WRIGHT I, MARTÍNEZ-VILALTA J, 2019. Leaf economics and xylem hydraulics drive leaf/wood area ratios. *New Phytologist*, 224: 1544-1556.
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- 52) ROSAS T, **MENCUCINI M**, BARBA J, COCHARD H, SAURA-MAS S, MARTÍNEZ-VILALTA J, 2019. Adjustments and coordination of hydraulic, leaf and stem traits along a water availability gradient. *New Phytologist*, 223: 632-646.
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- 54) POYATOS R, GRANDA V, FLO V, MOLOWNY-HORAS R, STEPPE K, **MENCUCINI M**, MARTÍNEZ-VILALTA J, 2019. SAPFLUXNET: A global database of sap flow measurements Version 0.1.3 [Data set]. *Zenodo*, DOI: <http://doi.org/10.5281/zenodo.2530798>.
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