

Curriculum Vitae Paola Nola

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Dip. Scienze della Terra e dell'Ambiente (DSTA)

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Scopus: H Index 23; Citations 2016

ISI -WOS: H Index 22; Citations 1763

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Education, Employment and Academic Position

- 1986 Honors degree in Natural Science, Univ. Pavia
- 1991 PhD in Plant ecology and taxonomy - Geobotany, Univ. Pavia. Title: Dendroecologia di Quercus robur L. nella valle sublacuale del fiume Ticino (co-supervisions: F. Serre-Bachet, France; E. Corona, Univ. Viterbo).
- 1992 Research Technician - Laboratory of Dendrochronology and Dendroecology, Univ. Pavia
- 1997 Researcher (SSD BIO/03), DSTA, Univ. Pavia
- 2007 Associate Professor of Environmental and applied Botany (SSD BIO/03), Univ. Pavia
- 2018 National full professor habilitation in Botany (SSD BIO/03 Environmental and Applied Botany) and in Forestry (SSD AGR/05 Forest settlement and silviculture).
- 2023 Full professor in Forestry (SSD AGR/05 Forest settlement and silviculture)

Research interests and expertise

Main research activities are based on tree ring science and related to Forest Ecology, with particular focus on the forest dynamics, climate/growth relationship, tree growth under climate change.

In-depth expertise on:

- Classical dendrochronology and tree-ring network management on both conifers and broadleaves species
- Forest ecology, dendroclimatology and climate change
- Quantification of tree growth and biomass increment
- Dendroanatomy
- Dating of historical musical instrument (violin) and wooden findings

Currently, she is working on multidisciplinary projects focused on oak declining and its ecological, physiological and genetics possible causes (ResQ project and PRIN2022 - Improving the RESilience to climate change of ITalian oak FORests facing dieback (ResItFor)

Awards and other recognitions

2002-2005 President of the Italian Institute of Dendrochronology

Success in previous Italian or international projects

[Role: Principal Investigator PI, Principal Investigator of local Unit UPI, member of local unit UM]

- 2022-2024 UPI UNIPV – PRIN 2022 - Improving the RESilience to climate change of Italian oak FOREsts facing dieback (ResItFor)
- 2020-2023 PI for the Research Project RESQ - Deperimento della quercia nei boschi pianiziali: studio multidisciplinare per la selezione di risorse genetiche resistenti - Bando Regione Lombardia Ricerca in campo agricolo e forestale (Coordinator Univ. Pavia)
- 2020-2022 UM of the Research Project OLTRENATURA – Tutela del capitale naturale e sociale attraverso la valorizzazione dei servizi ecosistemici e il lavoro in rete nell’Oltrepò Pavese - Fondazione Cariplo - Bando Capitale Naturale (Coord. Univ. Pavia)
- 2019-2024 UM and Vice-Coordinator of LIFE18 NAT/IT/000803 - Restoration of dry-acidic continental grasslands and heathlands in Natura 2000 sites in Piemonte and Lombardia - LIFE DRYLANDS (Coord. Univ. Pavia)
- 2005-2007 UPI UNIPV for the Research Project PACULLAR - I boschi di larice: un paesaggio culturale da conservare e da valorizzare - Bando Regione Lombardia Ricerca in campo agricolo (Coord. Univ. Torino)
- 2005-2006 Corresponding Project Partner UNIPV for the European Research Project EVK2-CT-2002-00148 EU - ALP-IMP - Multi-centennial climate variability in the Alps based on Instrumental data, Model simulations and Proxy data (Coord. Univ. Vienna)
- 2002-2004 UPI UNIPV for the Research Project FORALLOM - Foreste di alta quota delle Alpi lombarde: strutture, fattori limitanti, adattamenti fisiologici e dinamiche passate, presenti e future. Bando Regione Lombardia Ricerca e Sviluppo (Coord. Univ. Torino)
- 1998-2002 UPI UNIPV for the European Research Project ENV4-CT97-0641 UE - FORMAT Sensitivity of tree-growth to climate change and growth modelling from past to future (Coord. Univ. Marseille, France)
- 1996-1997 UPI UNIPV of the European Research FAIR CT95 0420 UE - RENFORS Regeneration of native forest stands for timber production and environmental value (Coord. Univ. Firenze)

Management experiences

Workshop and Meeting

- 2019 Scientific Board of the International Meeting TRACE 2019 - Tree rings in Archaeology, Climatology and Ecology, Caserta 7-10/05/2019
- 2015 Scientific board of the 110° Congress of the Italian Society of Botany (II International Congress of Plant Sciences) - Not only food: sustainable development, agro-biodiversity conservation & human well being, Pavia 14-18/09/2015
- 2010 Scientific Board of the 46° National Congress of the Italian Society of Vegetation Science - Countdown 2010 Save Biodiversity, Pavia 17-19/02/2010
- 2000 Organizer of the International Meeting From past to future: climate reconstruction and CO2 doubling scenario in the Mediterranean region, Pavia 16-20/10/2000
- 1994 Chair of the plenary section "Chronology building and dating", International Dendrochronological Meeting on Advances in European Dendrochronology, Germany 14-18/09/1994

Evaluation Board

- 2004 Selection board for a Research position in Environmental and Applied Botany, Univ. Torino
- 2001 Selection board for a Research position in Plant Ecology, Univ. Torino
- 1999 Evaluator of the Thesis: Contribution to a dendroclimatological study of Pinus brutia Ten in the area of Anopolis, South West Crete, Greece, C. Kazitani, Master of Science, Mediterranean Agronomic Institute of Chania, Creta, Greece
- 1999 Evaluator of the PhD Thesis; Dendroecological study of Quercus robur L. in Northern Galicia, I. García for European PhD
- 1996 Evaluator of the PhD Thesis: Etude dendroecologique de la dynamique dans les Alpes du Sud, en relation avec les facteurs climatique et anthropique, C. Belingard, Univ. Marseille, France

Management and coordination activities

- 2023 to present – Coordinator of the international Master Degree in Agri-Food Sustainability (LM-69)
- 2013 -2023 - Reference for Quality Assurance in teaching and research processes of DSTA, Univ. Pavia
- 2007-2013 Vice-President, Bachelor's Degree in Science and technologies for Nature (STN) and Master Degree in Natural Science (SN), Univ. Pavia
- 2007 to present - Management of University curricula and master degree
- 1996 to present - Coordination activities and management of research projects

Affiliation and Membership

- Member of Italian Society of Botany
- Member of Italian Society of Vegetation Science
- Member of Italian Society of Silviculture and Forest Ecology

Editorial activity

1999-2023 Associated Editor of international journal Dendrochronologia, Elsevier

Review Board of international journals: Radiocarbon, Dendrochronologia, Canadian Journal of Forest Research, European Journal of Forest Research, Plant Ecology, Journal of Vegetation Science, Plos One, Annals of Botany, Science of Total Environment, Climate Change, Tree-Ring Research, Plant biosystem, Annals of Silvicultural Research, iForest, Forest@

Teaching and tutoring activities (Courses, Thesis, PhD mentoring)

- 2023 to present – Forests and mitigation of climate change (Master Degree in Agri-Food Sustainability, LM69)
- 2023- to present – Plant and climate change (module Forests ecology) (Master Degree in Biodiversity conservation, Education and Science Communication, LM-60)
- 2001 to present - General Botany (Bachelor's Degree STN)
- 2008 to present - Laboratory of Dendroecology (Bachelor and Master Degree STN and SN)
- 2009 2022 - Plant Ecology (Bachelor's Degree Biological Science)
- 2001 -2014 - Dendrochronology (Bachelor's Degree in STN)
- 2001-2003 – Geobotany (Bachelor's Degree STN)
- Tutor for thesis both for bachelor and master degrees
- 2013-2019 - Board Member of the PhD Earth and Environmental Sciences, Univ. Pavia
- 2003-2015 -Board Member of the PhD Experimental Ecology and Geobotany, Univ. Pavia
- 1997-2000 - Board Member of the PhD Geobotany, Univ. Pavia
- Tutor for PhD thesis

Other activities

- 2021-2023- Research assignment on behalf of Parco Lombardo della Valle del Ticino for a study on the topic "Analysis of climate change resilience in the forests of Ticino Park"
- 2019-2021 – Research assignment on behalf of ERSAF (Regione Lombardia) for a study on the topic "Definizione di criteri e linee guida nella gestione dei querceti lombardi – Life gestire 2020"
- 2016 Contract for dendroecological analysis on old growth forest - Project IDEM - Innovative methods Development for forest Ecosystem Monitoring by remote sensing, Univ. Torino
- 2013 Contract for dendroecological analysis - Project NEWFOR - NEW technologies for a better mountain FORest timber mobilization (Alpine Space Priority Axis 2), Univ. Torino
- 2009-2011 Contract for dendroecological analysis - Interreg Project - Foreste di protezione: tecniche gestionali e innovazione nelle Alpi occidentali. Regione Piemonte, Univ. Torino

- 2006-2008 Reference for dendroecology - PRIN 2005 - Dal popolamento forestale al paesaggio, storia dell'uso del suolo da parte dell'uomo e dell'impatto antropico al limite superiore del bosco mediante dendroecologia, documenti storici, foto aeree e Sistemi Informativi Territoriali (GIS)
- 2005 Reference for Action B6 - Relazioni clima/accrescimento e dinamiche competitive - Interreg Project Le pinete delle vallate alpine: un elemento del paesaggio in mutazione, Univ. Torino
- 2002-2005 Reference for dendroecology - PRIN 2002 - I limiti superiori delle foreste delle Alpi e degli Appennini: strutture, dinamiche e fattori limitanti
- 1999-2001 Collaboration to the CNR Project - Dendrocronologia tra Alpi e Appennini, Univ. Milano
- 1996-1997 Reference for dendrochronological analysis of permanent plots - Project CONECOFOR Monitoraggio integrato degli ecosistemi forestali in aree di saggio permanenti
- 1995-1997 Contract for dendrochronological studies in the Project "Valutazione degli ecosistemi forestali sottoposti a condizioni di stress ambientale" - ERSAF Regione Lombardia
- 1993-1994 Contract for dendroclimatological studies - Pilot Project Italian Ministry for Agriculture and Forests "Inventario multirisorse della Regione Liguria"

International partnerships

- Lab. Bot. Hist. Palyn. (CNRS), Univ. Marsiglia, France
- Centre Européen de Recherche et d'Enseignement des Géosciences de l'Environnement - CEREGE - Aix-en-Provence, France
- Federal Institute for Forest, Snow and Landscape Research (WSL), Birmensdorf, Switzerland
- Dep. de Dendrocronología e Historia Ambiental, IANIGLA-CRICYT, Mendoza, Argentina
- Dep. de Sistemas y Recursos Naturales, Universidad Politécnica de Madrid, Madrid; Dep. Sistemas Físicos, Químicos y Naturales, Universidad Pablo de Olavide, Sevilla; Pyrenean Institute of Ecology, (IPE-CSIC), Zaragoza (Spain)
- Dep. Geography and Planning, School of Environmental Sciences, University of Liverpool, UK
- Dep. Geography, Johannes Gutenberg University, Mainz, Germany
- Dep. Wood Science and Technology, Biotechnical Faculty, University of Ljubljana, Ljubljana, Slovenia

Main scientific publications since 2010

1. Motta R, Garbarino M, Berretti R, Bono A, Curovic M, Dukic V, Nola P (2023) Monastic silviculture legacies and current old-growthness of silver fir (*Abies alba*) forests in the northern Apennines (Italy). FRONTIERS IN FORESTS AND GLOBAL CHANGE (<https://dx.doi.org/10.3389/ffgc.2023.1252462>)
2. Shindo L, Saulnier M, Raese H, Guibal F, Edouard JL, Bolka M, Carrer M, Corona C, Gassmann P, Grabner M, Guillet S, Nicolussi K, Nola P, Pignatelli O, Stoffel M (2023) European larch sapwood: A model for predicting the cambial age and for a more accurate dating. DENDROCHRONOLOGIA: 83 (126150) (<https://dx.doi.org/10.1016/j.dendro.2023.126150>)
3. Pericolo O., Avanzi C., Piotti A., Ripullone F., Nola P. (2023). A Novel Simplified Protocol for Pre-Processing Whole Wood Samples for Stable Isotope Analysis in Tree Rings. FORESTS, vol. 14, ISSN: 1999-4907, doi: 10.3390/f14030631
4. Simunek, V, Prokupková, A, Vacek, Z, Vacek, S, Cukor, J, Remes, J, Hájek, V, D'Andrea, G, Sálek, M, Nola, P, Pericolo, O, Holzbachová, S, Ripullone, F (2023). Silver fir tree-ring fluctuations decrease from north to south latitude-total solar irradiance and NAO are indicated as the main influencing factors. FOREST ECOSYSTEMS, vol. 10, ISSN: 2095-6355, doi: 10.1016/j.fecs.2023.100150
5. Pericolo O., Camarero J. J., Colangelo M., Valeriano C., Sanchez-Salguero R., Borghetti M., Castellaneta M., Nola P., Ripullone F. (2023). Species specific vulnerability to increased drought in temperate and Mediterranean floodplain forests. AGRICULTURAL AND FOREST METEOROLOGY, vol. 328, ISSN: 0168-1923, doi: 10.1016/j.agrformet.2022.109238
6. Martinez del Castillo E., Zang C. S., Buras A., Hackett-Pain A., Esper J., Serrano-Notivol R., Hartl C., Weigel R., Klesse S, Resco de Dios V., Scharnweber T., Dorado-Liñán I., van der Maaten-Theunissen M., van der Maaten E., Jump A., Mikac S., Banzragh B. E., Beck W., Cavin L., Claessens H., Čada V., Čufar K.,

- Dulamsuren C., Gričar J., Gil-Pelegrín E., Janda P., Kazimirovic M., Kreyling J., Latte N., Leuschner C., Alberto Longares L., Menzel A., Merela M., Motta R., Muffler L., Nola P., Mary Petritan A., Catalin Petritan I., Prislán P., Rubio-Cuadrado Á., Rydval M., Stajić B., Svoboda M., Toromani E., Trotsiuk V., Wilmking M., Zlatanov T., de Luis M. (2022). Climate-change-driven growth decline of European beech forests. *COMMUNICATIONS BIOLOGY*, vol. 5, p. 1-9, ISSN: 2399-3642, doi: 10.1038/s42003-022-03107-3
7. Dorado-Linan I., Ayarzagüena B., Babst F., Xu G., Gil L., Battipaglia G., Buras A., Cada V., Camarero J. J., Cavin L., Claessens H., Drobyshev I., Garamszegi B., Grabner M., Hacket-Pain A., Hartl C., Hevia A., Janda P., Jump A. S., Kazimirovic M., Keren S., Kreyling J., Land A., Latte N., Levanic T., van der Maaten E., van der Maaten-Theunissen M., Martínez-Sancho E., Menzel A., Mikolas M., Motta R., Muffler L., Nola P., Panayotov M., Petritan A. M., Petritan I. C., Popa I., Prislán P., Roibu C. -C., Rydval M., Sanchez-Salguero R., Scharnweber T., Stajic B., Svoboda M., Tegel W., Teodosiu M., Toromani E., Trotsiuk V., Turcu D. -O., Weigel R., Wilmking M., Zang C., Zlatanov T., Trouet V. (2022). Jet stream position explains regional anomalies in European beech forest productivity and tree growth. *NATURE COMMUNICATIONS*, vol. 13, ISSN: 2041-1723, doi: 10.1038/s41467-022-29615-8
 8. Nola P., Bracco F., Assini S., von Arx G., Castagneri D. (2020). Xylem anatomy of *Robinia pseudoacacia* L. and *Quercus robur* L. is differently affected by climate in a temperate alluvial forest. *ANNALS OF FOREST SCIENCE*, vol. 77, p. 1-16, ISSN: 1286-4560, doi: 10.1007/s13595-019-0906-z
 9. Granata M. U., Bracco F., Nola P., Catoni R. (2020). Photosynthetic characteristic and leaf traits variations along a natural light gradient in *Acer campestre* and *Crataegus monogyna*. *FLORA*, vol. 268, p. 1-8, ISSN: 0367-2530, doi: 10.1016/j.flora.2020.151626
 10. Hacket-Pain A., Ascoli D., Berretti R., Mencuccini M., Motta R., Nola P., Piusi P., Ruffinatto F., Vacchiano G. (2019). Temperature and masting control Norway spruce growth, but with high individual tree variability. *FOREST ECOLOGY AND MANAGEMENT*, vol. 438, p. 142-150, ISSN: 0378-1127, doi: 10.1016/j.foreco.2019.02.014
 11. Bosela, Michal, Lukac, Martin, Castagneri, Daniele, Sedmak, Robert, Biber, Peter, Carrer, Marco, Konopka, Bohdan, Nola P., Nagel, Thomas A., Popa, Ionel... (2018). Contrasting effects of environmental change on the radial growth of co-occurring beech and fir trees across Europe. *SCIENCE OF THE TOTAL ENVIRONMENT*, vol. 615, p. 1460-1469, ISSN: 0048-9697, doi:10.1016/j.scitotenv.2017.09.092
 12. Sanchez-Salguero, Raul, Camarero, J. Julio, Carrer, Marco, Gutiérrez, Emilia, Alla, Arben Q., Andreu-Hayles, Laia, Hevia, Andrea, Koutavas, Athanasios, Martínez-Sancho, Elisabet, Nola P.... (2017). Climate extremes and predicted warming threaten Mediterranean Holocene firs forests refugia. *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*, vol. 114, p. E10142-E10150, ISSN: 0027-8424, doi: 10.1073/pnas.1708109114
 13. Cook, Edward R., Seager, Richard, Kushnir, Yochanan, Briffa, Keith R., Büntgen, Ulf, Frank, David, Krusic, Paul J., Tegel, Willy, van der Schrier, Gerard, Andreu Hayles, Laia... (2015). Old World Megadroughts and Pluvials During the Common Era. *SCIENCE ADVANCES*, vol. 1, p. 1-9, ISSN: 2375-2548, doi: 10.1126/sciadv.1500561
 14. Gazol Antonio, Camarero J. Julio, Gutiérrez Emilia, Popa Ionel, Andreu-Hayles Laia, Motta Renzo, Nola P, Ribas Montserrat, Sangüesa-Barreda Gabriel, Urbinati Carlo, Carrer Marco (2015). Distinct effects of climate warming on populations of silver fir (*Abies alba*) across Europe. *JOURNAL OF BIOGEOGRAPHY*, vol. 42, p. 1150-1162, ISSN: 0305-0270, doi: 10.1111/jbi.12512
 15. Castagneri D., Nola P., Motta R., Carrer M. (2014). Summer climate variability over the last 250 years differently affected tree species radial growth in a mesic *Fagus-Abies-Picea* old-growth forest. *FOREST ECOLOGY AND MANAGEMENT*, vol. 320, p. 21-29, ISSN: 0378-1127, doi: 10.1016/j.foreco.2014.02.023
 16. Castagneri D., Garbarino M., Nola P. (2013). Host preference and growth patterns of ivy (*Hedera helix* L.) in a temperate alluvial forest. *PLANT ECOLOGY*, vol. 214, p. 1-9, ISSN: 1385-0237, doi:10.1007/s11258-012-0130-5
 17. Carrer M., Motta R., Nola P. (2012). Significant mean and extreme climate sensitivity of Norway spruce and silver fir at mid-elevation mesic sites in the Alps. *PLOS ONE*, vol. 7, p. 1-9, ISSN: 1932-6203, doi: 10.1371/journal.pone.0050755
 18. Castagneri D., Nola P., Cherubini P., Motta R. (2012). Temporal variability of size-growth relationships in a Norway spruce forest: the influences of stand structure, logging, and climate. *CANADIAN JOURNAL OF FOREST RESEARCH*, vol. 42, p. 550-560, ISSN: 1208-6037, doi: 10.1139/x2012-007

19. Carrer M., Nola P., Motta R., Urbinati C. (2010). Contrasting tree-ring growth to climate responses of *Abies alba* toward the southern limit of its distribution area. *OIKOS*, vol. 119, p. 1515-1525, ISSN:0030-1299, doi: 10.1111/j.1600-0706.2010.18293.x
20. Castagneri D., Lingua E., Vacchiano G., Nola, P., Motta R. (2010). Diachronic analysis of individual-tree mortality in a Norway spruce stand in the Eastern Italian Alps. *ANNALS OF FOREST SCIENCE*, vol. 67, p. 1-8, ISSN: 1286-4560, doi: 10.1051/forest/2009111
21. Corona C., Guiot J., Edouard J. L., Chaliè F., Buntgen U., Nola P., Urbinati C. (2010). Millennium-long summer temperature variations in the European Alps as reconstructed from tree rings. *CLIMATE OF THE PAST*, vol. 6, p. 379-400, ISSN: 1814-9324, doi: 10.5194/cp-6-379-2010
22. Motta R., Berretti R., Castagneri D., Lingua E., Nola, P., Vacchiano G. (2010). Stand and coarse woody debris dynamics in subalpine Norway spruce forests withdrawn from regular management. *ANNALS OF FOREST SCIENCE*, vol. 67, ISSN: 1286-4560, doi: 10.1051/forest/2010040