

Laia Andreu-Hayles, PhD.

Research Professor, Catalan Institution for Research and Advanced Studies (ICREA)
at the Ecological and Forestry Applications Research Center (CREAF)
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- **EDUCATION**

25/10/2007 – PhD in the program Advanced Studies in Ecology. Thesis entitled “*Climate and atmospheric CO₂ effects on Iberian pine forests assessed by tree-ring chronologies and their potential for climatic reconstructions*”. Maximum available qualification: Magna Cum Laude by unanimity. Department of Ecology, University of Barcelona, Spain. PhD Supervisor: Prof. Emilia Gutiérrez Merino

2000 – B.Sc. in Biology, September 1995 to June 2000. University of Barcelona, Spain.

- **CURRENT POSITIONS**

2020 – present: **Research Professor** at the Catalan Institution for Research and Advanced Studies (ICREA) at the Ecological and Forestry Applications Research Center (CREAF), Barcelona, Spain.

2013 – present (July-August): **Lecturer** in the Master of Science in Sustainability Management (SUMA) during summer July-August, School of Professional Studies, Earth Institute of Columbia University, New York, USA.

- **PREVIOUS POSITIONS**

2017 – present (leave of absence, LOA): Associate Research Professor of the Lamont-Doherty Earth Observatory of Columbia University, New York, USA. *Senior Staff* from 1 July 2020 to present (LOA) and *Junior Staff* from July 2017 to June 2020.

2014 – 2017 Assistant Research Professor of the Lamont-Doherty Earth Observatory of Columbia University, New York, USA.

2013 – 2014 Talented junior researcher, Catalan Institute of Climate Sciences (IC3), Barcelona, Spain.

2011 – 2014 Adjunct Associate Research Scientist and part-time Lamont Assistant Research Professor, Lamont-Doherty Earth Observatory of Columbia University, New York, USA.

2009 – 2011 Postdoctoral Research Fellow, Tree-Ring Laboratory, Lamont-Doherty Earth Observatory of Columbia University, New York, USA, 29 May 2009 to 28 October 2011.

2003 – 2009 Research Associate/Assistant, Ecology Depart, University of Barcelona, Barcelona, Spain.

- **RESEARCH ACHIEVEMENTS**

Andreu-Hayles is a tree-ring scientist expert in isotopic geochemistry, who has been leading paleoclimatic and ecological research in South America for the last 10 years contributing to significant advances in the field filling up the current gap in tropical dendrochronological records. Below there is a selection of five research outputs more relevant for this proposal from a total of **three book chapters** and **84 publications** in **international peer-review journals** (totalling 8475 citations with 37 h-index and a 65 i10-index; Google Scholar; 34 H-index Research ID). For full record see <https://orcid.org/0000-0003-4185-681X>.

*Rodríguez-Caton, M., Morales, ..., Andreu-Hayles, L. (2024) A 300-year tree-ring $\delta^{18}\text{O}$ -based precipitation reconstruction for the South American Altiplano highlights decadal hydroclimate teleconnections. *Communications Earth & Environment*, 5, 269.

Andreu-Hayles, L., Levesque, M., et al. (2019) A high yield cellulose extraction system for small whole wood samples and dual measurement of carbon and oxygen stable isotopes. *Chemical Geology*, 504, 53-65.

Andreu-Hayles, L., Tejedor, E., D'Arrigo, R., et al. (2023) Dendrochronological advances in the tropical and subtropical Americas: Research priorities and future directions. *Dendrochronologia*, 81, 126124.

Andreu-Hayles, L., M. Lévesque, R. Guerrieri, R. T. W. Siegwolf, and C. Körner (2022), Limits and Strengths of Tree-Ring Stable Isotopes, in *Stable Isotopes in Tree Rings: Inferring Physiological, Climatic and Environmental Responses*, edited by R. T. W. Siegwolf, J. R. Brooks, J. Roden and M. Saurer, pp. 399-428, Springer International Publishing, Cham, doi:10.1007/978-3-030-92698-4_14.

*#Levesque, M., Andreu-Hayles, L., Smith, W.K., Williams, A.P., Hobi, M.L., Allred, B.W. & Pederson, N. (2019) Tree-ring isotopes capture interannual vegetation productivity dynamics at the biome scale. *Nature Communications*, 10, 742.

- **AWARDS and FELLOWSHIP**

- 2023 – **Excellence in Mentoring Award** (*Scientific Category*, 2023) of the Lamont-Doherty Earth Observatory of Columbia University, Award ceremony 10 May 2024, New York, USA.
- 2010 – **Extraordinary Doctorate Award**, University of Barcelona, Award ceremony 26 January 2010, Barcelona, Spain.
- 2007 – **European Doctorate mention award** (2007), University of Barcelona, Spain.
- 2010 – Marie Curie International Outgoing Fellowship (IOF) (call: FP7-PEOPLE-2009-IOF).
- 2009 – “*Beatriu de Pinós*” (BP-DGR) postdoctoral grant 2008 (call: DOGC-nº5237-16.10.2008).
- 2008 – MICINN mobility grant for postdoctoral research 2008 (BOE-13.03.2009).

- **SUPERVISION OF GRADUATE STUDENTS AND EARLY CAREER RESEARCHERS**

6 Postdoctoral researchers / 4 PhD student / 1 Master Student

- 2020 – 2024 *Postdoctoral fellow* Clara Rodríguez-Morata, CREAM, Barcelona, Spain (2023- 2024) and Columbia University, New York, USA (2020-2022).
- 2022 – 2024 *Postdoctoral fellow* Kathelyn Paredes-Villanueva, Columbia University, New York, USA.
- 2020 – 2023 *Postdoctoral researcher* Arturo Pacheco-Solana, Columbia University, New York, USA.
Current position: Postdoctoral researcher at the University of Padua, Italy.
- 2018 – 2020 *Postdoctoral researcher* Milagros Rodríguez-Catón, Columbia University, NY, USA.
Current position: Researcher at the National Scientific and Technical Research Council (CONICET) in Argentina.
- 2016 – 2019 *Postdoctoral researcher* Ben Gaglioti, Columbia University, New York, USA.
Current position: Research Assistant Professor at the Water and Environmental Research Center, Institute of Northern Engineering, University of Alaska Fairbanks.
- 2014 – 2016 *Postdoctoral fellow* Mathieu Levesque, Columbia University, New York, USA.
Current position: Professor at the Department of Environmental System Sciences, Institute of Terrestrial Ecosystems, ETH, Zurich, Switzerland.
- 2024 – present *PhD student* Filippo Del Stabile, Department of Animal Biology, Plant Biology and Ecology, University of Barcelona, Barcelona, Spain.
- 2023 – present *PhD student* Josep Barriendos, graduate student at the Department of Geography, University Autonomous of Barcelona, Bellaterra, Spain.
- 2018 – 2024 *PhD student* Rose Oelkers, Columbia University, New York, USA.
- 2014 – 2019 *PhD student* Caroline Leland, Columbia University, New York, USA.
Current position: Postdoctoral researcher at William Paterson University, NJ, USA.
- 2011 – 2015 *MSc Student:* D.A. Herrera Ramírez, Universidad Nacional de Medellín, Colombia.

Andreu-Hayles is committed to support talent and contribute to mentor the new scientist generation under Diversity, Equity and Inclusion principles nurturing a passion for science. Her mentoring invests significant effort and quality time on training and offers opportunities to participate in high-quality projects, present in international venues and conduct collaborative research within a wide network of scientists across Europe, United States and South America. Andreu-Hayles also mentored 8 undergraduate students who published first-author publications and final theses at national and international level in South America.

- **TEACHING ACTIVITIES**

2013 – 2024 Lecturer in the Master of Science in Sustainability Management (SUMA), School of Professional Studies (before School of Continuing Education, Earth Institute of Columbia University), for the course ‘*Water Resources and Climate*’ Spring 2019, 2018; Summer 2024-2015; and Fall 2016-2013.

- **SYNERGETIC ACTIVITIES**

- 2024 – **Member of Past Global Changes** (PAGES) in working groups *2k Hydroclimate* and *ENSO/monsoon*.
- 2024 – 2023 – **Primary convener** and **chair** of the Global Change session ‘*Climate Change, Variability, and Impacts in South America*’ Fall Meeting AGU 2023, San Francisco, USA (GC44C and GC41I), 11-15 December 2023 & to be hold in Fall Meeting AGU 2024, Washington D.C., USA, 9-13 December 2024.
- 2022 – 2023 – **Guest editor** of the special issue in the peer-reviewed international journal *Dendrochronologia* (IF 2.293, 2019) entitled ‘*Advances in tropical and subtropical Dendrochronology in South America*’.
- 2022 – 2023 – **Member of the Steering Committee** of the Ecosystem Modeling Facility (EMF) of CREAM.

- 2022 – 2021 – **Primary convener** and **chair** of the Global Change session ‘Changes and impacts of climate variability in South America’ Fall Meeting AGU 2022, Chicago, USA (GC21A, GC22F and GC25B), 12-16 December 2022 & Fall Meeting AGU 2021, New Orleans, USA (GC51B and GC51C), 13-17 December 2021.
- 2022 – 2021 – **Judge** for the Outstanding Student Presentation Awards (OSPA), Fall Meeting AGU 2022, Chicago, USA, 12-16 Dec 2022 & Fall Meeting AGU 2021, New Orleans, USA, 13-17 Dec 2021.
- 2021 – **Member of the Screening Committee** for the 2021 Maths for America (MfA) on June 12, 2021 and June 6, 2021 for virtual applicant screening process of master teachers of math and science.
- 2019 – **Primary convener** and **chair** of the Global Change session ‘Changes and impacts of climate variability in South America’ Fall Meeting AGU 2019, San Francisco, USA (GC51A and GC43E), 9-13 Dec 2019.
- 2018 – **Chair** of the conference sessions ‘Tropical Dendrochronology’ and ‘Isotopes and Tree-rings’ at the 10th World Dendro Conference, 10-16 June 2018, Thimphu, Bhutan.
- 2016 – **Member of the Organizing Committee** of the workshop ‘PAGES2k-PMIP3: Comparing data and model estimates of hydroclimate variability and change over the Common Era’, Lamont-Doherty Earth Observatory, 1-3 June, Palisades, US.
- 2016 – **Chair** of the conference session ‘Isotopes’, Third American Dendrochronology Conference, 28 March to 1 April 2016, Mendoza, Argentina.
- 2012 – **Convener** and **chair** of the Biogeosciences session entitled ‘Forest dynamics under a changing climate and their long-term context’, Fall Meeting AGU 2012, San Francisco, CA, 3 - 7 December 2012.
- Reviewer** – *Nature Climate Change, Global Change Biology, Climatic Change, Environmental Research Letters, Journal of Geophysical Research, Trees, Annals of Forests Sciences, Dendrochronology* and *Arctic*, as well as proposals for the National Science Foundation (NSF) and National Geographic.

• PROJECTS RELATED TO THIS PROPOSAL

As a Principal Investigator (PI) Andreu-Hayles has been lead or co-PI in a total of **18 projects** (totaling \$6,272,000 and 181,500€ at her Institution) with 5 active and 13 completed projects, as well **14 projects** with budgets below \$12,000 (\$168,000). Below a selection of the projects more related to this proposal are listed.

- National Science Foundation (NSF), AGS-2402659, ‘Collaborative Research: Temperature Variability and Extremes at Multiple Temporal Scales in North Asia from Millennial-length Wood Anatomical Records’, co-PI: **L. Andreu-Hayles**; Total: 76.068 USD; 01/09/2025 - 31/08/2027.
- National Science Foundation (NSF), AGS-2303524, ‘Collaborative Research: Intertropical Convergence Zone Variations from Stable Oxygen Isotope Tree-Ring Records in the Tropical Americas’, Lead PI: **L. Andreu-Hayles**; Award at L.A-H Institution: \$562,254; Duration: 02/01/2024 - 01/31/2027.
- MINISTERIO DE CIENCIA E INNOVACION ‘PROYECTOS DE GENERACIÓN DE CONOCIMIENTO 2021’ (Project PID2021-126411OB-I00), ‘Long-term perspective to the current environmental crisis in the Iberian Mediterranean region from dendrochronological and historical Archives’, acrònim: DENDROHIST; IP: L. Andreu-Hayles; 181.500€; 01/09/2022 – 31/08/2025.
- National Science Foundation (NSF), PLR 1504134 ‘Response of High-latitude Forests to a Warmer and CO₂-enriched Atmosphere: Tree Rings in a Process-based Model’, Arctic Natural Sciences (ANS); Lead PI: **L. Andreu-Hayles**; co-PIs: D’Arrigo, R, Field, R.; Award: \$579,971; Duration: 6/15/15-12/31/20.
- National Science Foundation (NSF), PLR-1603473 ‘Collaborative Research: Determining the Vulnerability and Resilience of Boreal Forests and Shrubs across Northwestern North America’, Arctic Natural Sciences (ANS) program; Lead PI: D’Arrigo, R; co-PI: **L. Andreu-Hayles**; Award at L.A-H Institution: \$372,000; Duration: 9/1/16 - 8/31/20.
- National Science Foundation (NSF), OPP-1737788 ‘Collaborative Research: Climate, human and ecosystem interactions in the face of a rapidly changing North Asian biome’, Office of Polar Programs (OPP); Lead PI: Davi, N., co-PI; **L. Andreu-Hayles**; Award at L.A-H Institution: \$489,475; Duration: 9/1/17 - 8/31/24.
- National Science Foundation (NSF), AGS-1702789 ‘Collaborative Research: Reconstructing South American monsoon sensitivity to internal and external forcing: reconciling models and tree-ring proxies in the Central Andes’, Paleo Perspective of Climate Change (P2C2); Lead PI: **L. Andreu-Hayles**, Co-PI: D’Arrigo, R., w/ Passow, M.; Award at L.A-H Institution: \$544,853; Duration: 3/1/18 - 2/28/23.