

CURRICULUM VITAE
SOUMAYA BELMECHERI

University of Arizona
Laboratory of Tree Ring Research
1215 E Lowell Street, Tucson, AZ 85721-0045
ORCID: 0000-0003-1258-2741
EMAIL: sbelmecheri@email.arizona.edu
INTERNET: <http://www.soumayabelmecheri.com/>

APPOINTMENTS

NATIONAL SCIENCE FOUNDATION 2019- Program Director, Paleoclimate program.	Alexandria, VA
UNIVERSITY OF ARIZONA 2015- Assistant Research Scientist	Tucson, AZ
THE PENNSYLVANIA STATE UNIVERSITY 2010-2014 Research associate	State College, PA
MUSEUM OF NATURAL HISTORY OF PARIS UNIVERSITY OF JULES-VERNES 2009-2010 Lecturer & Research Associate	Paris-Amiens, France

EDUCATION

UNIVERSITY OF ORSAY-LABORATORY OF ENVIRONMENTAL AND CLIMATE SCIENCES 2008- PhD, Geosciences	Orsay, France
UNIVERSITY OF ORSAY-LABORATORY OF ENVIRONMENTAL AND CLIMATE SCIENCES 2005- Master in Geosciences	Orsay, France
UNIVERSITY OF ALGIERS 2003- Master in Geology	Algiers, Algeria

HONORS

2020 Visiting fellowship at the University of Bologna-Italy (postponed to 2021 due to COVID)
2018 American Geophysical Union Voices for Sciences Fellowship- Policy Track
2018 Florence Hawley Ellis Diversity Award- Tree Ring Society.
2017 Cozzarelli Prize of the Proceedings of the National Academy of Sciences for papers of outstanding scientific excellence and originality.

PUBLICATIONS

Peer reviewed

- [37] Heilman, K. A., V. Trouet., **S. Belmecheri.**, N. Pederson., M.A. Berke., J.S. McLachlan. “Increased water use efficiency leads to decreased precipitation sensitivity of tree growth, but is offset by high temperatures”. *Oecologia* (2021). doi:10.1007/s00442-021-04892-0
- [36] **Belmecheri, S.**, R.S., Maxwell, Taylor, A. H., Davis, K, Guerrieri R., D. J.P., Moore, S. Rayback. “Climate alters the CO₂ effect on water-use efficiency of temperate forests”. *Global Change Biology* (2021) <https://doi.org/10.1111/gcb.15491>.
- [35] **Belmecheri, S.** & Lavergne, A. “Compiled records of atmospheric CO₂ concentrations and stable carbon isotopes to reconstruct climate and derive plant ecophysiological indices from tree rings”. *Dendrochronologia* **63**, 125748 (2020).
- [34] Walker, A. P., De Kawe, M.G., Bastos, A., **Belmecheri, S.**, et al. “Integrating the evidence for a terrestrial carbon sink caused by increasing atmospheric CO₂”. *New Phytol.* Tansley Review <https://doi.org/10.1111/nph.16866> (2020).
- [33] Rayback, S. A., **Belmecheri, S.**, et al “North American temperate conifer (*Tsuga canadensis*) reveals a complex physiological response to climatic and anthropogenic stressors.” *New Phytol.*, nph.16811 (2020).
- [32] Stockton Maxwell, R., **Belmecheri, S.**, Taylor, A. H., Davis, K. J. & Ocheltree, T. W. “Carbon isotope ratios in tree rings respond differently to climatic variations than tree-ring width in a mesic temperate forest”. *Agric. For. Meteorol.* **288–289**, 108014 (2020).
- [31] Szejner P, **Belmecheri, S**; Ehleringer J, Monson R. (2019) “Recent increases in drought frequency cause observed multi-year drought legacies in the tree rings of semi-arid forests ”. *Oecologia*. <https://doi.org/10.1007/s00442-019-04550-6>.
- [30] Hudson, A. R. R. Alfaro-Sanchez, F. Babst, **S. Belmecheri**, D.J.P. Moore, V. Trouet (2019) “Seasonal and synoptic climatic drivers of tree growth in the Bighorn Mountains, WY, USA (1654–1983 CE)”. *Dendrochronologia* **58**, 125633 (2019).
- [29] R. Guerrieri, **S. Belmecheri**, S. Ollinger, H. Asbjornsen, K. Jennings, J. Xiao, B. D. Stocker, M. Martin, D. Hollinger, R. Bracho-Garrillo, K. Clark, S. Dore, T. Kolb, J.W. Munger, K. Novick, and A. D Richardson (2019) “Disentangling the role of photosynthesis and stomatal conductance on rising forest water-use efficiency”. *Proceedings of the National Academy of Sciences*.
- [28] Alfaro-Sánchez R, Nguyen H, Klesse S, Hudson A, **Belmecheri S**, Köse N, Diaz HF, Monson RK, Villalba R, Trouet V. (2018) Climatic and volcanic forcing of tropical belt northern boundary over the last 800 years. *Nature Geoscience*.
- [27] Xu, G.; Liu, X.; **Belmecheri, S.**; Chen, T.; Wu, G.; Wang, B.; Zeng, X.; Wang, W. (2018). Disentangling Contributions of CO₂ Concentration and Climate to Changes in Intrinsic Water-Use Efficiency in the Arid Boreal Forest in China’s Altay Mountains. *Forests*, **9**, 642.

- [26] Szejner P, Wright W E, **Belmecheri S**, Meko D, Leavitt SW, Ehleringer JR, Monson RK. (2018) Disentangling seasonal and interannual lag effects on forest water demand and carbon assimilation using tree-ring stable isotopes. *Global Change Biology*. Doi:10.1111/gcb.14395
- [25] **Belmecheri S**, Wright WE, Szejner P, Morino KA, and Monson RK. (2018) Carbon and oxygen isotope fractionation in tree rings reveals interactions between cambial phenology and seasonal climate. *Plant, Cell & Environment*. Doi: 10.1111/pce.13401
- [24] Wooller MJ, Saulnier-Talbot E, Potter BA, **Belmecheri S**, Bigelow N, Choy K, Cwynar L, Davis K, Graham G, Kurek J, Langdon P, Rawcliffe R, Wang Y, Williams JW. A (2018) new terrestrial paleoenvironmental record from the Bering Land Bridge and context for human dispersal. *R. Soc. open sci.* 5: 180145. <http://dx.doi.org/10.1098/rsos.180145>
- [23] Monson, R. K., P. Szejner, **S. Belmecheri**, K. A. Morino, and W. E. Wright. (2018) Finding the seasons in tree ring stable isotope ratios. *American Journal of Botany* 105(5): 1–3.
- [22] Klippel, L., Krusic, P. J., Brandes, R., Hartl, C., **Belmecheri, S.**, Dienst, M. & Esper, J. (2018) A 1286-year hydro-climate reconstruction for the Balkan Peninsula. *Boreas*. doi:10.1111/bor.12320
- [21] Guerrieri R, Jennings K, **Belmecheri S**, Asbjornsen H, Ollinger S (2017) Evaluating climate signal recorded in tree ring $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ values from bulk wood and α -cellulose for six species across four sites in the northeastern. *US Rapid Communications in Mass Spectrometry*. 31 (24), 2081-2091.
- [20] **Belmecheri S**, Babst F, Hudson AR, Betancourt J, Trouet V (2017) Northern Hemisphere Jet Stream Position Indices as Diagnostic Tools for Climate and Ecosystem Dynamics. *Earth Interactions*, 21, 1–23.
- [19] Andersen N, Lauterbach S, Erlenkeuser H, Danielopol DL, Namiotko T, Hüls M, **Belmecheri S**, Dulski P, Nantke C, Meyer H, Chaplignin B, von Grafenstein U, Brauer A (2017) Evidence for higher-than-average air temperatures after the 8.2 ka event provided by a Central European $\delta^{18}\text{O}$ record. *Quaternary Science Reviews*, 172, 96–108.
- [18] Messenger E, Nomade S, Wilhelm B, Martkoplshvili I, Ollivier V, Mgeladze, A, Dumoulin JP, Mazuv A, **Belmecheri S**, Lordkipanidze D (2017) New pollen evidence from Nariani (Georgia) for delayed postglacial forest expansion in the South Caucasus. *Quaternary Research*, 87, 121–132.
- [17] Graham RW, **Belmecheri S**, Choy K et al (2016) Timing and causes of mid-Holocene mammoth extinction on St Paul Island, Alaska. *Proceedings of the National Academy of Sciences*, 113, 9310–9314.
- [16] **Belmecheri S**, Babst F, Wahl ER, Stahle DW, Trouet V (2016) Multi-century evaluation of Sierra Nevada snowpack. *Nature Climate Change*, 6, 2–3.
- [15] Kretchun AM, Loudermilk EL, Scheller RM, Hurteau MD, **Belmecheri S** (2016) Climate and bark beetle effects on forest productivity — linking dendroecology with forest landscape modeling. *Canadian Journal of Forest Research*, 46, 1026–1034.
- [14] Babst F, Wright WE, Szejner P, Wells L, **Belmecheri S**, Monson RK (2016) Blue intensity parameters derived from Ponderosa pine tree rings characterize intra-annual density fluctuations and reveal seasonally divergent water limitations. *Trees*, 30, 1403–1415.

- [13] Szejner P, Wright WE, Babst F, **Belmecheri S**, Trouet, V, Leavitt SW, Ehleringer JR, Monson RK (2016) Latitudinal gradients in tree ring stable carbon and oxygen isotopes reveal differential climate influences of the North American Monsoon System. *Journal of Geophysical Research: Biogeosciences*, 121, 1978–1991.
- [12] **Belmecheri S**, Maxwell RS, Taylor AH, Davis KJ, Freeman KH, Munger WJ (2014) Tree-ring $\delta^{13}\text{C}$ tracks flux tower ecosystem productivity estimates in a NE temperate forest. *Environmental Research Letters*, 9, 74011.
- [11] Ammann B, van Raden UJ, Schwander J, Eicher U, Gilli A, Bernasconi SM, van Leeuwen JFN, Lischke H, Brooks SJ, Heiri O, Nováková K, van Hardenbroek M, von Grafenstein U, **Belmecheri S** et al (2014) Corrigendum to “Responses to rapid warming at Termination 1a at Gerzensee (Central Europe): Primary succession, albedo, soils, lake development, and ecological interactions. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 401, 183–184.
- [10] Amman B, van Raden JD, Schwander J, Eicher U, Gilli A, Bernasconi SM, van Leeuwen JFN, Lischke H, Brooks SJ, Heiri O, Nováková K, van Hardenbroek M, von Grafenstein U, **Belmecheri S** et al (2013) Responses to rapid warming at Termination 1a at Gerzensee (Central Europe): Primary succession, albedo, soils, lake development, and ecological interactions. *Palaeogeography, Palaeoclimatology, Palaeoecology*, Volume 391, Part B, 111–131, <https://doi.org/10.1016/j.palaeo.2013.11.009>.
- [9] von Grafenstein U, **Belmecheri S**, Eicher U, van Raden UJ, Erlenkeuser H, Andersen N, Ammann B (2013) The oxygen and carbon isotopic signatures of biogenic carbonates in Gerzensee, Switzerland, during the rapid warming around 14,685 years BP and the following interstadial. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 391, 25–32.
- [8] Kennett DJ, Hajdas I, Culleton BJ, **Belmecheri S** et al (2013) Correlating the Ancient Maya and Modern European Calendars with High-Precision AMS ^{14}C Dating. *Scientific Reports*, 3, 1597.
- [7] Messager E, **Belmecheri S**, Von Grafenstein U et al (2013) Late Quaternary record of the vegetation and catchment-related changes from Lake Paravani (Javakheti, South Caucasus). *Quaternary Science Reviews*, 77, 125–140.
- [6] Namiotko T, Danielopol DL, **Belmecheri S**, Gross M, von Grafenstein U (2012) On the Leptocytheridae Ostracods of the Long-Lived Lake Ohrid: A Reappraisal of their Taxonomic Assignment and Biogeographic Origin. *International Review of Hydrobiology*, 97, 356–374.
- [5] **Belmecheri S**, von Grafenstein U, Andersen N, Eymard-Bordon A, Régnier D, Grenier C, Lézine A-M (2010) Ostracod-based isotope record from Lake Ohrid (Balkan Peninsula) over the last 140 ka. *Quaternary Science Reviews*, 29, 3894–3904.
- [4] Lézine A-M, von Grafenstein U, Andersen N, **Belmecheri S**, et al (2010) Lake Ohrid, Albania, provides an exceptional multi-proxy record of environmental changes during the last glacial–interglacial cycle. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 287, 116–127.
- [3] **Belmecheri S**, Namiotko T, Robert C, von Grafenstein U, Danielopol DL (2009) Climate controlled ostracod preservation in Lake Ohrid (Albania, Macedonia). *Palaeogeography, Palaeoclimatology, Palaeoecology*, 277, 236–245.

[2] Veres D, Wohlfarth B, Andrieu-Ponel V, Björck, S, De Beaulieu, J-L, Digerfeldt, G, Ponel, P, Ampel, L, Davies, S, Gandouin, E and **Belmecheri, S** (2007) The lithostratigraphy of the Les Echets basin, France: tentative correlation between cores. *Boreas*, 36, 326–340.

Book Chapters

[1] Von Grafenstein, U and **Belmecheri S** (2013) Air-lake interface: using ostracods from temperate lakes In *Paleoclimatology: a survey on ancient climates Volume 1-To find, date and interpret indices* Duplessey JC, Ramstein G. Ed. CNRS.

[2] **Belmecheri S**, Wright W.E., Szejner, P., (in Review) “Sample collection and preparation for annual and intra-annual tree-ring isotope chronologies”. In *Stable Isotopes in Tree Rings: Inferring Physiological, Climatic and Environmental Responses*. Springer Physiology Book Series. Ed. R. Brooks, J. Roden, R.Siegwolf, M.Saurer.

GRANTS

[4] USDA-USDI Joint Fire Science Program, \$196,801; 08/29/2014 – 04/30/2017 PI: Alan H Taylor Co-PI: **Soumaya Belmecheri** Do fuel treatments restore ecosystem function? Water use efficiency before and after fire suppression and fuels treatments in fire-prone pine forests in the western United States.

[3] Penn State Institute for Energy and the Environment, \$24,974; 03/15/2014- 06/31/2015 PI: **Soumaya Belmecheri**, Co-PIs: Mathew Hurteau (PSU), Lee Newsom (PSU) Summer temperature variability, Drought and the Atlas Cedar: A tree-ring $\delta^{13}\text{C}$ based multi-centennial record in Northwestern Africa.

[2] NSF-BCS- 1229887, \$205,601; 8/15/2012-1/31/2016 PI: Alan H Taylor Co-PI: **Soumaya Belmecheri**, Stockton Maxwell, Kenneth J Davis Estimating Forest productivity Over Regional and Multi-Decadal Time Scales Using Carbon Isotopes in Tree Rings.

[1] NSF-PLR-1204033, \$487,728; 2/1/2013- 1/21/2016 PI: Russell W Graham Co-PI: **Soumaya Belmecheri** Collaborative research: Paleoclimate, Paleoenvironment and Other Potential Drivers of Extinction of *Mammuthus primigenius*, St Paul Island, Pribilof Islands, Alaska.

TEACHING & MENTORING

Lecturer 2009-2010 University of Jules Vernes & Museum of Natural History of Paris, France
Designed and taught classes in Geology, Atmospheric and ocean circulation, Paleoclimatology.

Instructor 2012-2014 The Pennsylvania State University State College, PA USA.
Meteo-469: From Meteorology to Mitigation: Understanding Global warming (Online course, e-Dutton education University Park and World campus).

Guest Lecturer 2015-Present Laboratory of Tree Ring Research (University of Arizona, AZ USA)

- Introduction to Dendrochronology (Tree Rings and the Carbon Cycle).
- Dendroecology Pre-session (Tree rings NPP and Carbon).
- Global Biogeochemical Cycles (Terrestrial Carbon Cycle).

- Dendrochronology Pre-session (Tree Rings as proxies of past climate, hydrology, plant physiology & Carbon cycle).

Mentor and supervisor from 2008-Present (France and USA)

Undergraduate Students (9), Master Students (3), REU students (1), graduate students through Pro-Grad seminar (10).

PRESENTATIONS Invited or Recent (2017 to present)

[21] **Belmecheri S** (2021) “Tools for Cyber-Paleoclimate” National Science Foundation. (USA)

[20] **Belmecheri S** (2021) “Meet a Climate Scientist” University of Vermont (USA) (**Invited**).

[19] **Belmecheri S** (2020) “Trends and drivers of forest water use efficiency since the industrial revolution” George Mason University Geology Seminar (USA) (**Invited**).

[18] **Belmecheri S**, P. Szejner, D. Frank, S. Voelker, A. Lavergne (2020) “Global trends of tree-ring carbon isotope discrimination under rising atmospheric CO₂ and changing climate” European Geoscience Union, Vienna (Virtual).

[17] **Belmecheri S** (2019) “Science and Society: Panel Discussion and Networking” American Geophysical Union 2019-San Francisco, (USA) (**Invited**).

[16] **Belmecheri S**, P. Szejner, D. Frank (2019) “Global Trends Of Forest’s Water Use Efficiency Response To Rising CO₂” American Geophysical Union 2019-San Francisco, (USA) (**Invited**).

[15] **Belmecheri S** (2019) “Epic Pluvial modulates the physiological response of temperate forests to rising CO₂”, Harvard Forest-Massachusetts, (USA) (**Invited**).

[14] **Belmecheri S** (2019) “Monsoon Stories from the Sky Islands”, University of Arizona Science Cafe at Tucson Botanical Gardens-Tucson, Arizona, (USA) (**Invited**).

[13] **Belmecheri S**, K. Morino, J.F. Knowle, P. Szejner, W.E. Wright, R.K. Monson, G. Barron-Gafford, D. J. Frank. (2018) “The pulse of a semi-arid forest: intra-seasonal progression of water and carbon exchange”. American Geophysical Union 2018-Washington DC., (USA) E-lightning.

[12] **Belmecheri S** (2018) “Tales of Tree Rings and Past Climates”, American Geophysical Union 2018-Washington DC., (USA) (**Invited**).

[11] R, Trouet V., Alfaro-Sánchez R, Nguyen H, Klesse S, Hudson A, **Belmecheri S**, Köse N, Diaz HF, Monson RK, Villalba (2018) A tree-ring based reconstruction of spring Northern Hemisphere tropical belt movements over the past 800 years. American Geophysical Union 2018-Washington DC., (USA).

[10] **Belmecheri S** (2018) “Global trends of water use efficiency”. University of West Virginia-Morgantown, (USA) (**Invited**).

[9] **Belmecheri S** (2018) “The role of climate in tree response to rising CO₂”. University of Arizona-Tucson, (USA) (**Invited**).

[8] **Belmecheri S** (2018) “Interactions between cambial phenology and seasonal climate: Insights from tree-ring stable isotopes in the North American monsoon system”. University of New Mexico-New Mexico, (USA) **(Invited)**.

[7] **Belmecheri S** (2018) “Extreme weather and climate change” World without Genocide Summer Institute-Mitchell Hamlin School of Law, Minneapolis, USA. **(Invited)**.

[6] **Belmecheri S** (2018) “Carbon and oxygen isotope fractionations in tree rings reveal interactions between cambial phenology and seasonal climate”. ESA Annual Meeting 2018- New Orleans, USA. **(Invited)**.

[5] Heilman K, McLachlan J, Pederson N, Trouet V, and **Belmecheri S** (2018) “Tree growth in a changing world: Factors mediating the effects of CO₂ on tree ring growth and Water Use Efficiency”. ESA Annual Meeting 2018- New Orleans, USA.

[4] **Belmecheri S** (2018) “Dr Florence Hawley Ellis Lecture: The role of climate in forest response to rising CO₂: Insights from tree-ring carbon isotopes”. The WorldDendro Conference, Timphu, Bhutan **(Invited)**.

[3] Heilman K, Pederson N, Trouet V, and **Belmecheri S** (2018) “Anthropogenic changes impact drought sensitivity across a savanna-forest biome boundary”. The WorldDendro Conference, Timphu, Bhutan.

[2] Alfaro-Sánchez R, Nguyen H, Klesse S, Hudson A, **Belmecheri S**, Köse N, Diaz HF, Monson RK, Villalba R, Trouet V. (2018) Natural drivers of early spring northern tropical belt movements over the past 800 years. The WorldDendro Conference, Timphu, Bhutan.

[1] Hudson A, Alfaro-Sanchez R, **Belmecheri S**, Moore D.J, Trouet V. (2017) “Summer Temperature Extremes in the Northern Rockies: A Tree-Ring-Based Reconstruction (1670-2014) from the Bighorn Mountains, WY”. American Geophysical Union 2017-New Orleans, (USA)

SERVICE

Reviewer of journal manuscripts for: *Proceedings of the National Academy of Sciences, Nature Communication, Climate Dynamics, New Phytologist, JGR-Biogeosciences, Climate of the Past, Palaeogeography, Palaeoclimatology, Palaeoecology, PloS one, Quaternary Sciences Reviews, Forest Ecology and Management, Trees, Tree Physiology, Oecologia, Canadian Journal of Forest Research, Journal of Ecology, Earth and Planetary Science Letters, Tree-Ring Research, Dendrochronologia, Forests, Great Lakes Research, Quaternaire.*

Proposal Reviewer for: *The National Science Foundation (NSF, USA), The Consortium for Arizona-Mexico Arid Environments (CAZMEX, USA), The Agnese Nelms Haury Program in Environment and Social Justice (University of Arizona, USA), National Geographic Society (USA), Marie Curie Fellowship (EUROPE), Centre National de Recherche Scientifique (FRANCE).*

Member of the American Geophysical Union Position Statement Committee 2020-2021.

Co-organizer and Convener of “New Avenues of Multiproxy Dendroecology: Synthesis, Challenges, and Opportunities of High-Resolution Tree Ring Research ” eLightning session at American Geophysical Union Conference 2019, San Francisco, USA.

Co-founder and coordinator, Laboratory of Tree-Ring Research Graduate Scientific and Professional Training Seminar (PRO-grad) Fall 2017-Spring/Fall 2018.

Co-organizer of 'Integrating CO₂ fertilization Evidence Streams and Theory (ICOFEST): Global Terrestrial C Sink' meeting, September 17-21, 2018, Biosphere-2, Tucson, Arizona.

Member of the workplace climate committee in the College of Science, University of Arizona 2017-2019.

Organizer, Tree-Ring Talks speakers' series 2017-2018, Laboratory of Tree-Ring Research, University of Arizona Tucson, AZ

Organizer and chair of 'Carbon and Water Cycling in Terrestrial Ecosystems during the Anthropocene' session at American Geophysical Union Conference 2016, San Francisco, USA.

Convener of 'Isotopes in dendrochronology' session at the Second American Dendrochronology Conference 2013, Tucson, USA.

Co-organizer of 'Dendrochronological Applications: Isotopes in Dendrochronology' session at The Association of American Geographers Conference 2012, NY, USA

PROFESSIONAL TRAINING

- Congressional Operations Seminar, the Government Affairs Institute-Georgetown University, 2019.
- Speaking Up: How Bystanders Can Change the Conversation in STEM workshop, AGU Ethics and Equity Center, 2019.
- Making Your Case to Congress workshop, Alan Alda Center for communicating Science, 2019.
- Unconscious Bias Workshop, UC Berkeley Unconscious Bias Project, 2018.
- Leader in Classroom Diversity & Inclusion, University of Arizona, 2018.
- Science Communication workshop, Alan Alda Center for communicating Science, 2017.
- Expert Witness Training Academy, Mitchell Hamlin School of Law, 2017.
- Communicating Science Workshop, American Academy for the Advancement of Sciences, 2016.