

Curriculum Vitae for Dr. James R. Ehleringer

University School of Biological Sciences
 Address: University of Utah, 257 S 1400 E
 Salt Lake City, Utah 84112-0840

Office telephone: 801-971-6004

Web: <http://ehleringer.net>

E-mail: jim.ehleringer@utah.edu

Education:

B.S.	San Diego State University	1972
M.S.	San Diego State University	1973
Ph.D.	Stanford University	1977

University of Utah Affiliations:

2000-present	Distinguished Professor, School of Biological Sciences, http://ecophys.utah.edu
1984-present	Director, Stable Isotope Ratio Facility for Environmental Research (SIRFER); http://sirfer.utah.edu
2009-2015	Director, Global Change and Sustainability Center http://environment.utah.edu
2013-2016	Member, UU Sustainability leadership team, http://sustainability.utah.edu
2008-2010	Research Director, Entrada Field Station, http://riomesa.utah.edu
1993-1996	Chair of Biology, Department of Biology, http://biology.utah.edu
1984-2000	Professor, Department of Biology
1980-1984	Associate Professor, Department of Biology
1977-1980	Assistant Professor, Department of Biology

Commercial Affiliations:

2004-2020	Senior scientist or advisor	IsoForensics, Inc., Salt Lake City
-----------	-----------------------------	------------------------------------

Certifications:

- Certified Approved Forensic Practitioner, Forensic Isotope Ratio Mass Spectrometry Network, 2013-2017 (<http://www.forensic-isotopes.org/fafp.html>)

Research Expertise:

- Plant physiological ecology and ecosystem ecology
- Stable isotope ecology
- Greenhouse gases in natural ecosystems and urban regions
- Stable isotope forensics
- Stable isotopes in plants, animals, hydrology, foods, beverages, and plant products

Ecosystem Field Experiences:

Agricultural	Amaranth, castor bean, common bean, cotton, sunflower
Alpine tundra	Colorado
Arid and semi-arid	Argentina, Arizona, Australia, California, Chile, Mexico, Nevada, Utah
Forest	California, Canada, Maine, Massachusetts, Oregon, Utah, Washington
Tropics	Brazil, China, French Guiana, Puerto Rico
Urban	Salt Lake Valley, Utah

Forensic Stable Isotope Ratio Experiences:

Anthropology	Bones, food, hair, teeth
Beverages	Beer, juices, milk, coffees, soft drinks, spirits, wines, bottled water, coconut water
Biology - animals	Feathers, tissues, teeth, hair, wool

Biology - microbes	Culture media, spores
Biology - plants	Leaves, tree rings, wood, cellulose, inflorescences
Controlled substances	Cocaine, heroin, marijuana, pseudoephedrine
Explosives	High energy, military, nitrates, peroxides
Foods	Beer, carbohydrates, coconut waters, coffees, honeys, meats, oils, proteins, spirits, wines
Gases	Carbon dioxide, methane, water vapor
Humans	Body water, bone, diet history, fingernails, hair, teeth, travel history
Law enforcement	Controlled substances, explosives, food, fraud, manufactured materials, unidentified decedents,
Manufactured items	Clothing, counterfeits, currencies, documents, inks, paper products
Waters	Drinking water, groundwater, surface water, plants, precipitation, rivers

Courses developed and taught at the University of Utah; current year teaching is in bold:

Biology 1620	Fundamentals of Biology II YOUTUBE channel
Biology 3960	Fresher Seminar and Lab: Stable Isotopes – You Are What You Eat (http://www.ehleringer.net/fresher.html)
Biology 5460/5465	Plant Ecology in a Changing World, Lecture and Laboratory (http://www.plantecology.net) YOUTUBE channel
Biology 5470/5475	Stable Isotope Biogeochemistry and Ecology, Lecture and Laboratory
Biology 6921	Isotopes Seminar
Biology 7463/7465	Stable Isotope Biogeochemistry and Ecology, Lecture and Laboratory (http://www.stableisotopes.net). YOUTUBE channel
Sustainability 6000	Global Changes and Society (originally Biology 7961) (https://environment.utah.edu/students/gcsc-courses)
Honors 3700	Think Tank – Wasatch Water: Evaporating Opportunities (http://honors.utah.edu/students/engaged-learning/praxis-labs/ecosystem-services-and-the-american-dream/)

National and International Instructional Courses Developed:

1996-2019	IsoCamp, Stable Isotope Biogeochemistry and Ecology Lectures and Laboratory (Originator and coordinator), http://stableisotopes.net YOUTUBE channel
1996-2014	Stable Isotopes in Forensics, Salt Lake City and Washington D.C.

Honors and Distinctions:

2017	Outstanding Education Program in Earth and Space Science Award, American Geophysical Union
2016-present	The Ehleringer Prize, annual named prize recognizing an outstanding graduate student ecological publication in <i>Oecologia</i> each year
2016	Rosenblatt Prize for Excellence, University of Utah
2016	Elected as member of the U.S. National Academy of Sciences
2016	Elected as Fellow of the Ecological Society of America
2008	Elected as Fellow of the American Geophysical Union
2000	Elected Distinguished Professor, University of Utah
1999	Governors Medal for Science and Technology, State of Utah
1999	Elected as Fellow of the American Association for Advancement of Science
1998	Students Choice Award for Teaching, University of Utah
1988	Distinguished Research Award, University of Utah
1984	Alexander von Humboldt Fellowship

1978	Murray Buell Award, Ecological Society of America
1974-1977	Carnegie Predoctoral Fellow, Carnegie Institution of Washington, Stanford
1974	Achievement Rewards for College Scientists (ARCS) Scholarship
1971	Outstanding Graduating Senior, Sciences, San Diego State University
1969-1971	Golden Scholarship, San Diego State University

Professional Service:**Editorial Boards:**

Editorial Board	Oecologia	1982-present
Editor-in-chief	Oecologia	1989-2006
Editorial Board	Physiological Ecology Series, Academic Press	1988-2004
Editorial Board	Plant Cell Environment	1992-2012
Editorial Board	Trends in Plant Science	1998-2007
Editorial Board	Tree Physiology	1998-2014
Editorial Board	Functional Ecology	1986-2000
Section Head	Physiological Ecology, Faculty of 1000	2004-2010

Advisory Boards and Consortia:

1986-2011	Ecology Institute Board (Terrestrial Ecology), Oldendorf
1992-1994	Physiological Ecology Section, Ecological Society of America, Chair
1997-2003	Global Change and Terrestrial Ecosystems (GCTE), Focus 1 Office, Core Project of the International Geosphere Biosphere Program (IGBP), Chair
1997-2006	Biosphere-Atmosphere Stable Isotope Network (BASIN), Chair
1997-2010	Biosphere-Atmosphere Stable Isotope Network (BASIN), Steering Committee
1998-2003	Carbon Science Working Group, IGBP
1999-2003	Global Change and Terrestrial Ecosystems (GCTE), Vice Chair
2000-2009	Max-Planck-Institut für Biogeochemie, Advisory Board
2002-2008	NITECRIME, member
2004-2005	Research Infrastructure Committee, National Ecological Observatory Network
2007-2009	National Ecological Observatory Network (NEON), Board of Directors
2004-present	Founding member, Forensic Isotope Ratio Mass Spectrometry Network, FIRMS
2006-2018	Biological and Environmental Research Advisory Committee (BERAC), U.S. Department of Energy
2015-2018	Western Water Alliance, External Advisory Board
2018-present	Friends of Alta, board member

Scientific Review Boards:

1983-2005, various years	NSF, panel member
1983-1992, various years	USDA, panel member
1986-1987	Plant Response to Environmental Stress, USDA-CRGO, Program Manager
1990-2017, various years	DOE, panel member
1990-1992	National Research Council, Committee on Plant Sciences
1993-1994	U.S. Nuclear Waste Regulatory Board, panel member
2001-2004, various years	NASA, panel member
2016-present	Division of Environment and Life Sciences Advisory Panel, U.S. National Academy of Sciences

Workshops and Events (Organizer or Co-organizer):

- 1984 Workshop on Future Needs in Physiological Ecology, Asilomar
- 1986 Stable Isotopes in Ecology, Lake Arrowhead
- 1990 Ecological Society of America, 75th Annual Meeting, Snowbird
- 1990 Workshop on Scaling in Ecology, Snowbird
- 1992 Carbon and Water Relations Perspectives from Stable Isotopes, Riverside
- 1995 Ecological Society of America, 80th Annual Meeting, Snowbird
- 1997 Biosphere-Atmosphere Stable Isotope Network Workshop, Snowbird
- 1998 Biosphere-Atmosphere Stable Isotope Network Workshop, Barcelona
- 2000 GCTE International Science Conference, Barcelona
- 2000 Controls Over Soil Respiration and Decomposition Workshop (GCTE), Jena
- 2000 Ecological Society of America, 85th Annual Meeting, Snowbird
- 2000 CO₂ Boundary Layer Budget Flux Methods Workshop, Gubbio
- 2001 Atmospheric CO₂ and its Effects on Plants, Animals and Ecosystems, Snowbird
- 2002 Stable Isotopes in Biosphere-Atmosphere Interactions, Banff
- 2003 Stable Isotopic Signals of the Terrestrial Biosphere: Linking Ecosystem C fluxes to Isotopic Signals of Plant Components, Orvieto
- 2004 Partitioning of Fluxes Between the Biosphere and the Atmosphere Across Spatial Scales, Interlaken
- 2004 On the Formation of a National Stable Isotope Network in NEON, Park City
- 2005 Stable Isotopes in the National NEON Plan, Tucson
- 2005 Lead coordinator for purchase and development of the Entrada Ranch in southern Utah as a University facility for research, teaching, and outreach
- 2006 Chair of DOE-BERAC Subcommittee review of elevated CO₂ ecosystem research within the Department of Energy
- 2006 Lead coordinator to develop site locations and RFI responses for NEON research in the Great Basin (Domain 15)
- 2006 Isotopes as Recorders of Ecological Change, Tomar
- 2009 Lead development of Global Change and Sustainability Center, University of Utah
- 2010 Co-lead development of EPSCoR Track-1: iUTAH, Urban Transitions and Aridregion Hydro-sustainability
- 2015 Co-lead, Workshop on the Development of an IFL Urban Observatory, BERAC, DOE

Publications (last ten years, 2011-2021):

- 422. Rodushkin, I., D.C. Baxter, E. Engström, J. Hoogewerff, P. Horn, W. Papesch, J. Watling, C. Latkoczy, G. van der Peijl, S. Berends-Montero, J. Ehleringer, and V. Zdanowicz. 2011. Elemental and isotopic characterization of cane and beet sugars. *Journal of Food Composition and Analysis* 24:70-78. doi:10.1016/j.jfca.2010.05.005.
- 423. Chesson, L.A., B.J. Tipple, B.R. Erkkila, T.E. Cerling, and J.R. Ehleringer. 2011. B-HIVE: Beeswax Hydrogen Isotopes as Validation of Environment. Part 1. Bulk honey and honeycomb stable isotope analysis. *Food Chemistry* 125:576-581; doi:10.1016/j.foodchem.2010.09.050.
- 424. Kennedy, C.D., G.J. Bowen, and J.R. Ehleringer. 2011. Temporal variations of oxygen isotope ratios ($\delta^{18}\text{O}$) in drinking water: Implications for specifying location of origin with human scalp hair. *Forensic Science International* doi:10.1016/j.forsciint.2010.11.021.
- 425. Martinelli, L.A., G.B. Nardoto, L.A. Chesson, F.D. Rinaldi, J.P.H.B. Ometto, T.E. Cerling, and J.R. Ehleringer. 2011. Worldwide stable carbon and nitrogen isotopes of Big Mac® patties: an example of a truly “glocal” food. *Food Chemistry* 127:1712-1718.

- doi:10.1016/j.foodchem.2011.02.046.
426. Barnette, J.E., M.J. Lott, J.D. Howa, D. W. Podlesak, and J.R. Ehleringer. 2011. $\delta^2\text{H}$ and $\delta^{18}\text{O}$ isotope values in hydrogen peroxide. *Rapid Communications in Mass Spectrometry* 25:1422-1428. doi:10.1022/rcm.5004
427. Dang, X., C.-T. Lai, D.Y. Hollinger, A.J. Schauer, J. Xiao, J.W. Munger, C. Owensby, and J.R. Ehleringer. 2011. Combining tower mixing ratio and community model data to estimate regional-scale net ecosystem carbon exchange by boundary layer inversion over four flux towers in the United States. *Journal of Geophysical Research - Biogeosciences* 116:G03036, doi:10.1029/2010JG001554.
428. Ehleringer, J.R., J.F. Casale, J.E. Barnette, X. Xu, M.J. Lott, and J.M. Hurley. 2011. ^{14}C analyses quantify time lag between coca leaf harvest and street-level seizure of cocaine. *Forensic Science International* doi:10.1016/j.forsciint.2011.05.003.
429. Strong, C., C. Stwertka, D.R. Bowling, B.B. Stevens, and J.R. Ehleringer. 2011. Urban carbon dioxide cycles within the Salt Lake Valley: a multiple box model validated by observations. *Journal of Geophysical Research - Atmospheres* 116:D15307, doi:10.1029/2011JD015693.
430. Valenzuela, L.O., Chesson, L.A., S. O'Grady, T.E. Cerling, and J.R. Ehleringer. 2011. Spatial distributions of carbon, nitrogen and sulfur isotope ratios in human hair across the central United States. *Rapid Communications in Mass Spectrometry* 25:861-868, doi:10.1002/rcm.4934.
431. Chesson, L.A., J.R. Ehleringer, and T.E. Cerling. 2011. Light-element isotopes (H, C, N, and O) as tracers of human diet: a case study on fast food meals, pages 707-723. Chapter 33. In M. Baskaran (ed.), *Handbook of Environmental Isotope Geochemistry. Advances in Isotope Geochemistry*. Springer Verlag, Berlin.
432. Chesson, L.A., L.O. Valenzuela, G.J. Bowen, T.E. Cerling, and J.R. Ehleringer. 2011. Consistent predictable patterns in the hydrogen and oxygen stable isotope ratios of animal proteins consumed by modern humans in the USA. *Rapid Communications in Mass Spectrometry* 25:3713-3722.
433. Ehleringer, J.R., J.F. Casale, J.E. Barnette, X. Xu, M.J. Lott, and J.M. Hurley. 2011. $\Delta^{14}\text{C}$ calibration curves for modern plant material from tropical regions of South America. *Radiocarbon* 53(4):585-594.
434. Podlesak, D.W., G.J. Bowen, S. O'Grady, T.E. Cerling, and J.R. Ehleringer. 2012. $\delta^2\text{H}$ and $\delta^{18}\text{O}$ of human body water: a GIS model to distinguish residents from non-residents in the contiguous USA. *Isotopes in Environmental and Health Studies* 48:259-279. doi:10.1080/10256016.2012.644283
435. Valenzuela, L.O., L.A. Chesson, G.J. Bowen, T.E. Cerling, and J.R. Ehleringer. 2012. Dietary heterogeneity among western industrialized countries reflected in the stable isotope ratios of human hair. *PLoS ONE* 7(3):e34234. doi:10.1371/journal.pone.0034234.
436. Tipple, B.J., L.A. Chesson, B.R. Erkkila, T.E. Cerling, and J.R. Ehleringer. 2012. B-HIVE: Beeswax hydrogen isotopes as validation of environment. Part II. Compound-specific hydrogen isotope analysis. *Food Chemistry* 134(1):494-501. doi:10.1016/j.foodchem.2012.02.106

437. O'Grady, S.P., L.O. Valenzuela, C.H. Remien, L.E. Enright, M.J. Jorgensen, J. Kaplan, J.D. Wagner, T.E. Cerling, and J.R. Ehleringer. 2012. Hydrogen and oxygen isotope ratios in body water and hair: modeling isotope dynamics in nonhuman primates. *American Journal of Primatology* 74(7):651-660. doi:10.1002/ajp.22019
438. McKain, K., S.C. Wofsy, T. Nehrjorn, J. Eluszkiewicz, J. R. Ehleringer, and B.B. Stephens. 2012. Assessment of ground-based atmospheric observations for verification of greenhouse gas emissions from urban areas. *Proceedings of the National Academy of Sciences USA* 109:8423-8428.
439. Chesson, L.A., B.J. Tipple, G.N. Mackey, S.A. Hynek, D. Fernandez, and J.R. Ehleringer. 2012. Strontium isotope ratios of tap water from the coterminous USA. *Ecosphere* 3(7): <http://dx.doi.org/10.1890/ES1812-00122.00121>.
440. Kreuzer, H.W., J.B. West, and J.R. Ehleringer. 2012. Forensic applications of light-element stable isotope ratios of *Ricinus communis* seeds and ricin preparations. *Journal of Forensic Sciences* 58:S43-S51. doi:10.1111/1556-0429.12000.
441. Webb-Robertson, B.J., H. Kreuzer, G. Hart, J. Ehleringer, J. West, G. Gill, and D. Duckworth. 2012. Bayesian integration of isotope ratio for geographic sourcing of castor beans. *Journal of Biomedicine and Biotechnology* Volume 2012, Article ID 450967, doi:10.1155/2012/450967.
442. Tipple, B.J., M.A. Berke, C.E. Doman, S. Khachatryan, and J.R. Ehleringer. 2013. Leaf *n*-alkanes record the plant-water environment at leaf flush. *Proceedings of the National Academy of Sciences USA* 110(7):2659-2664. doi:10.1073/pnas.1213875110.
443. Domingues, T.F., L.A. Martinelli, and J.R. Ehleringer. 2013. Seasonal patterns of leaf-level photosynthetic gas exchange in an eastern Amazonian rain forest. *Plant Ecology & Diversity* doi:10.1080/17550874.2012.748849.
444. Hultine, K.R., K.G. Burtch, and J.R. Ehleringer. 2013. Gender specific patterns of carbon uptake and water use in a dominant riparian tree species in a warming climate. *Global Change Biology* 19:3390-3405. doi:10.1111/gcb.12230.
445. Tipple, B.J., T. Chau, L.A. Chesson, D.P. Fernandez, and J.R. Ehleringer. 2013. Isolation of strontium pools and isotope ratios in modern hair. *Analytica Chimica Acta* 798:64-73.
446. Chesson, L.A., B. Tipple, B. Erkkila, and J.R. Ehleringer. 2013. Hydrogen and oxygen stable isotope analysis of pollen collected from honey. *Grana* 52:305-315. doi:10.1080/00173134.2013.841751.
447. Chesson, L.A., B.J. Tipple, J.D. Howa, G.J. Bowen, J.E. Barnette, T.E. Cerling, and J.R. Ehleringer. 2014. Stable isotopes in forensic applications. In H.D. Holland and K.K. Turekian (eds.), *Treatise of Geochemistry, Second Edition*, vol. 14, pages 285-317. Oxford, London.
448. Thompson, A.H., A.S. Wilson, and J.R. Ehleringer. 2014. Hair as a geochemical recorder: ancient to modern, pages 371-393. In H.D. Holland and K.K. Turekian (eds.), *Treatise of Geochemistry, Second Edition*, vol. 14. Oxford, London
449. Remien, C., F.R. Adler, L.A. Chesson, L.O. Valenzuela, J.R. Ehleringer, and T.E. Cerling. 2014.

- Deconvolution of isotope signals from bundles of multiple hairs. *Oecologia* 175:781-789. doi: 10.1007/s00442-014-2945-3
450. Howa, J.D., M.J. Lott, L.A. Chesson, and J.R. Ehleringer. 2014. Carbon and nitrogen isotope ratios of factory produced RDX and HMX. *Forensic Science International* 240:80-87. Doi:10.1016/j.forsciint.2014.04.013
451. Howa, J.D., M.J. Lott, L.A. Chesson, and J.R. Ehleringer. 2014. Isolation and stable nitrogen isotope analysis of ammonium ions in ammonium nitrate pills using sodium tetraphenylborate. *Rapid Communications in Mass Spectrometry* 28:1530-1534, <http://dx.doi.org/10.1002/rcm.6929>
452. Chesson, L.A., B.J. Tipple, J.E. Barnette, T.E. Cerling, and J.R. Ehleringer. 2014. The potential for application of ink stable isotope ratio analysis in questioned document examination. *Science & Justice*, doi:10.1016/j.scijus.2014.05.010
453. Ehleringer, J.R., and D.R. Sandquist. 2014. Photosynthesis: physiological and ecological considerations, pages 245-268. In L. Taiz, E. Zeiger, I.M. Moller, and A. Murphy (eds.), *Plant physiology and development*, 6th edition, Sinauer Associates, Sunderland, MA.
454. Howa, J.D., M.J. Lott, and J.R. Ehleringer. 2014. Observations and sources of carbon and nitrogen isotope ratio variation of pentaerythritol tetranitrate (PETN). *Forensic Science International* 244:152-157.
455. Bender, R.L., D. L. Dufour, L.O. Valenzuela, T.E. Cerling, M. Sponheimer, J.C. Reina, and J.R. Ehleringer. 2014. Stable isotopes (carbon, nitrogen, sulfur), diet, and anthropometry in urban Colombian women: investigating socioeconomic differences. *American Journal of Human Biology* doi:10.002/ajhb.2264
456. Tipple, B, M. Berke, B. Hambach, J.S. Roden, and J.R. Ehleringer. 2014. Predicting leaf wax *n*-alkane ²H/¹H ratios: controlled water source and humidity experiments with hydroponically grown trees confirm predictions of Craig-Gordon model. *Plant, Cell and Environment* 38:1035-1047. doi:10.1111/pce.12457.
457. Good, S.P., C. D. Kennedy, J.C. Stalker, L. A. Chesson, L. O. Valenzuela, M. M. Beasley, J. R. Ehleringer, and G.J. Bowen. 2014. Patterns of local and non-local water resource use across the western United States determined via stable isotope intercomparisons. *Water Resource Research* 50(10):8034-8049. doi:10.1002/2014WR015884.
458. Bush, S.E., F.M. Hopkins, J.T. Randerson, C.T. Lai, and J.R. Ehleringer. 2015. Design and application of a mobile ground-based observatory for continuous measurements of atmospheric trace-gas and criteria pollutant species. *Atmospheric Measurement Techniques Discussions* 8:33-63. doi:10.5194/amtd-8-33-2015.
459. Mallia, D.V., J.C. Lin, S. Urbanski, J.R. Ehleringer, and T. Nehrkorn. 2015. Impacts of upstream wildfire emissions on CO, CO₂, and PM_{2.5} concentrations in Salt Lake City, Utah. *Journal of Geophysical Research: Atmospheres* doi: 10.1002/2014JD022472.
460. Taylor, A.J., C.T. Lai, F. Hopkins, S. Wharton, K. Bible, X. Xu, C. Phillips, S. Bush, and J. R. Ehleringer. 2015. Radiocarbon-based partitioning of soil respiration in an old-growth coniferous forest. *Ecosystems* doi:10.1007/s10021-014-9839-4

461. Gorski, G., C. Strong, S.P. Good, R. Bares, J.R. Ehleringer, and G.J. Bowen. 2015. Vapor hydrogen and oxygen isotopes reflect water of combustion in the urban atmosphere. *Proceedings of the National Academy of Sciences USA* 112:3247-3252. Doi:10.1073/pnas.1424728112.
462. Walsh, T.C., O.L. Miller, B.B. Bowen, Z.A. Levine, and J.R. Ehleringer. 2015. The sphere of sustainability: lessons from the University of Utah's Global Change and Society. *Journal of Water Resources Planning and Environment*. doi 10.1061/(ASCE)WR.1943-5452.0000514.
463. Hale, R.L., A. Armstrong, M.A. Baker, S. Bedingfield, D. Betts, C. Buahin, M. Buchert, T.A. Crowl, R.R. Dupont, J. R. Ehleringer, J. Endter-Wada, C. Flint, J. Grant, S. Hanners, Daniel Horns, J. Horsburgh, D. Jackson-Smith, A. S. Jones, C. Licon, S. E. Null, A. Odame, D.E. Pataki, D. Rosenberg, M. Runburg, P. Stoker, and C. Strong. 2015. iSAW: Integrating structure, actors, and water to study socio-hydro-ecological systems. *Earth's Future* 3:110-132. doi: 10.1002/2014EF000295
464. Lott, M.J., J.D. Howa, L.A. Chesson, and J.R. Ehleringer. 2015. Improved accuracy and precision in $\delta^{15}\text{N}_{\text{AIR}}$ measurements of explosives, urea, and inorganic nitrates by EA-IRMS using thermal decomposition. *Rapid Communications in Mass Spectrometry* 29:1381-1388.
465. Zazzo, A., T.E. Cerling, J.R. Ehleringer, A. Mooney, F.J. Monahan, and O. Schmidt. 2015. Isotopic composition of sheep wool records seasonality of climate and diet. *Rapid Communications in Mass Spectrometry* 29:1357-1369.
466. Ehleringer, J.R., L.A. Chesson, L.O. Valenzuela, B.J. Tipple, and L.A. Martinelli. 2015. Stable isotopes trace the truth: from adulterated foods to crime scenes. *Elements* 11:259-264.
467. Hall, S.J., R.L. Hale, M.A. Baker, D.R. Bowling, and J.R. Ehleringer. 2015. Riparian plant isotopes reflect anthropogenic nitrogen perturbations: robust patterns across land use gradients. *Ecosphere* 6(10):article200. <http://www.esajournals.org/doi/pdf/10.1890/ES15-00319.1>
468. Berke, M.A., B.J. Tipple, B. Hambach, and J.R. Ehleringer. 2015. Life-form specific gradients in compound specific $\delta^2\text{H}$ of modern leaf waxes along a North American monsoonal transect. *Oecologia* 179:981-997. doi: 10.1007/s00442-015-3432-1
469. Gurney, K.R., P. Romero-Lankao, K.C. Seto, L.R. Hutyrá, R. Duren, C. Kennedy, N.B. Grimm, J.R. Ehleringer, P. Marcotullio, S. Hughes, S. Pincetl, M.V. Chester, D.M. Runfola, J.J. Feddema, and J. Sperling. 2015. Tracking urban emissions on a human scale. *Nature* 525:179-181.
470. Hopkins, F.M., E.A. Kort, S. E. Bush, J.R. Ehleringer, C.T. Lai, D.R. Blake, and J.T. Randerson. 2016. Spatial patterns and source attribution of urban methane in the Los Angeles Basin. *Journal of Geophysical Research Atmospheres* 121: doi:10.1002/2015JD024429.
471. Patarasuk, R., K.R. Gurney, D. O'Keefe, Y. Song, J. Huang, P. Rao, M. Buchert, J. Lin, D. Mendoza, and J.R. Ehleringer. 2016. Urban high-resolution fossil fuel CO_2 emissions quantification and exploration of emission drivers for potential policy questions. *Urban Ecosystems* 19:1013-1039. doi: 10.1007/s11252-016-0553-1.
472. Tipple, B.J., B. Hambach, J.E. Barnette, L.A. Chesson, and J.R. Ehleringer. 2016. The influences of cultivation setting on inflorescence lipid distributions, concentrations, and carbon isotope ratios of *Cannabis* sp. *Forensic Science International* 262:233-241. doi:10.1016/j.forsciint.2016.03.029

473. Cerling, T.E., J.E. Barnette, G.J. Bowen, L.A. Chesson, J.R. Ehleringer, C.H. Remien, P. Shea, B.J. Tipple, and J.B. West. 2016. Forensics stable isotope biogeochemistry. *Annual Review of Earth and Planetary Sciences* 44:175-206.
474. Ehleringer, J.R., J. Barnette, Y. Jameel, B.J. Tipple, and G.J. Bowen. 2016. Urban water – a new frontier in isotope hydrology. *Isotopes in Environmental and Health Studies* 52:477-486. doi: 10.1080/10256016.2016.1171217.
475. Szejner, P., W.E. Wright, F. Babst, S. Belmecheri, V. Trouet, S.W. Leavitt, J.R. Ehleringer, and R.K. Monson. 2016. Latitudinal gradients in tree-ring carbon and oxygen isotopes reveal differential climate influences of the North American Monsoon System. *Journal of Geophysical Research: Biogeosciences* doi 10.1002/2016/JG003460
476. Howa, J.D., M.J. Lott, L.A. Chesson, and J.R. Ehleringer. 2016. Isolation of components of plastic explosives for isotope ratio mass spectrometry. *Forensic Chemistry* doi 10.1016/j.forc.2016.07.003
477. Jameel, Y., S. Brewer, S.P. Good, B.J. Tipple, J.R. Ehleringer, and G.J. Bowen. 2016. Tap water isotope ratios reflect urban water system structure and dynamics across a semi-arid metropolitan area. *Water Resources Research* 52: doi:10.1002/2106WR019104.
478. Chesson, L.A., J.D. Howa, M.J. Lott, and J.R. Ehleringer. 2016. A component-specific approach for applying isotope ratio mass spectrometry to explosives. *Forensic Chemistry* 2:9-14. doi:10.1016/j.forc.2016.08.003.
479. Hopkins, F.M., J.R. Ehleringer, S.E. Bush, R.M. Duren, C.E. Miller, C.-T. Lai, Y.-K. Hsu, V. Carranza, and J.T. Randerson. 2016. Mitigation of methane emissions in cities: how new measurements and partnerships can contribute to emissions reductions strategies. *Earth Futures* DOI 10.1002/2016EF000381.
480. Mallick, K., I. Trebs, E. Boegh, L. Giustarini, M. Schlerf, D. Drewery, L. Hoffman, C. von Randow, B. Kruijt, A. Arujo, S. Saleska, J.R. Ehleringer, T. Domingues, J.P. Ometto, A. Nobre, O. Morales, M. Hayek, J.W. Munger, and S. Wofsy. 2016. Canopy-scale biophysical controls of transpiration and evaporation in the Amazon Basin. *Hydrology and Earth System Sciences* 20:4237-4264. Doi:10.519/hess-20-4237-2016
481. Kimball, S., J.L. Funk, D.R. Sandquist, and J.R. Ehleringer. 2016. Ecophysiological considerations for restoration, pages 153-181. In Palmer, M.A., J.B. Zedler, and D.A. Falk (eds.), *Foundations of Restoration Ecology*. Second Edition. Island Press, New York.
482. Ehleringer, J.R., S. Daniel, S. Torti, B. Bowen, and T. Parks. 2016. *Embedded in Nature: The University of Utah Field Stations*. University of Utah, Salt Lake City. 120 pages. ISBN 978-0-692-81221-1.
483. Chau, T.H., B.J. Tipple, L. Hu, D.P. Fernandez, T.E. Cerling, and J.R. Ehleringer. 2017. Reconstruction of travel history using coupled $\delta^{18}\text{O}$ and $^{87}\text{Sr}/^{86}\text{Sr}$ measurements of hair. *Rapid Communications in Mass Spectrometry* 31:583-589.
484. Hall, S.J., E. Ogata, S.R. Weintraub, M.A. Baker, J.R. Ehleringer, C. Czimczik, and D.R. Bowling. 2016. Convergence in nitrogen deposition and cryptic isotope composition across urban

- and agricultural valleys in northern Utah. *Journal of Geophysical Research – Biogeochemistry* 121:2340-2355.
485. Tipple, B.J., Y. Jameel, T.H. Chau, C.J. Mancuso, G.J. Bowen, A. Dufour, L.A. Chesson, and J.R. Ehleringer. 2017. Stable hydrogen and oxygen isotopes of tap water reveal structure of the San Francisco Bay Area's water systems and adjustments during a major drought. *Water Research* 119:212-224.
486. Ehleringer, J.R. Interpreting stable isotope ratios in plants and plant-based foods. 2017. In J.F. Carter and L.A. Chesson (eds.), *Food Forensics – Stable Isotopes as a Guide to Authenticity and Origin*, pages 46-62. CRC Press Taylor & Francis Group, Boca Raton.
487. Raczka, B., S.C. Biraud, J.R. Ehleringer, C.-T. Lai, J.B. Miller, D.E. Pataki, S.R. Saleska, M.S. Torn, B.H. Vaughn, R. Wehr, and D.R. Bowling. 2017. Does vapor pressure deficit drive the seasonality of $\delta^{13}\text{C}$ of the net land-atmosphere CO_2 exchange across the United States? *Journal of Geophysical Research, Biogeosciences* 122: doi:10.1002/2017JG003795.
488. Mouteva, G.O., J.T. Randerson, S.M. Fahreni, S.E. Bush, J.R. Ehleringer, X. Xu, G.M. Santos, R. Kuprov, B.A. Schichtel, and C.I. Czimczik. 2017. Using radiocarbon to constrain black and organic carbon aerosol sources in Salt Lake City. *Journal of Geographical Research – Atmospheres* 122, doi:10.1022/2017JD026519.
489. Duarte, H.F., B.M. Raczka, D.M. Ricciuto, J.C. Lin, C.D. Koven, P.E. Thornton, D.R. Bowling, C.-T. Lai, K.J. Bible, and J.R. Ehleringer. 2017. Evaluating the Community Land Model (CLM 4.5) at a coniferous forest site in northwestern United States using flux and carbon-isotope measurements. *Biogeosciences* 14:4315-4340. doi: /10.5194/bg-14-4315-2017.
490. Cook, C.S., B. Erkkila, S. Chakraborty, B.J. Tipple, T.E. Cerling, and J.R. Ehleringer. 2017. *Stable isotope biogeochemistry and ecology laboratory manual*. First Edition. Kindle Direct Publishing, Seattle. Available at Amazon.com. 181 pages. ISBN 978-1-973-34908-2.
491. Chesson, L.A., B.J. Tipple, J.R. Ehleringer, T. Park, and E.J. Bartelink. 2018. Forensic applications of isotope landscapes ('isoscapes'): a tool for predicting region-of-origin in forensic anthropology cases, pages 127-148. Chapter 8. In C.C. Boyd and D.C. Boyd (eds.), *Forensic Anthropology: Theoretical Framework and Scientific Basis*. John Wiley and Sons, Ltd., New York.
492. Howa, J., J.E. Barnette, L.A. Chesson, M.J. Lott, and J.R. Ehleringer. 2018. TATP isotope ratios as influenced by worldwide acetone variation. *Talanta* 181:125-131. <https://doi.org/10.1016/j.talanta.2018.01.001>.
493. Valenzuela, L.O., S. P. O'Grady, L. E. Enright, M. Murtaugh, C. Sweeney, and J.R. Ehleringer. 2018. Evaluation of childhood nutrition by dietary survey and stable isotope analyses of hair and breath. *American Journal of Human Biology* e23103. <https://doi.org/10.1002/ajhb.23103>.
494. Tipple, B.J., L.O. Valenzuela, and J.R. Ehleringer. 2018. Strontium isotope ratios of human hair record intra-city variations in tap water source. *Scientific Reports* 8:3334. <https://doi.org/10.1038/s41598-018-21359-0>.
495. Mitchell, L.E., J.C. Lin, D.R. Bowling, D.E. Pataki, C. Strong, A.J. Schauer, R. Bares, S.E. Bush, B.B. Stephens, D. Mendoza, D. Mallia, L. Holland, K.R. Gurney, and J.R. Ehleringer. 2018.

- Long-term urban carbon dioxide observations reveal spatial and temporal dynamics related to urban characteristics and growth. *Proceedings of the National Academy of Sciences USA* 115:2912-2917. <https://doi.org/10.1073/pnas.1702393115>.
496. Mitchell, L.E., E.T. Crossman, A.A. Jacques, B. Fasoli, L. Leclair-Marzolf, J. Horel, D.R. Bowling, J.R. Ehleringer, and J.C. Lin. 2018. Monitoring of greenhouse gases and pollutants across an urban area using a light rail public transit platform. *Atmospheric Environment* 187:9-23. <https://doi.org/10.1016/j.atmosenv.2018.044>.
497. Fiorella, R.P., R. Barnes, J.C. Lin, J.R. Ehleringer, and G.J. Bowen. 2018. Detection and variability of combustion-derived vapor in an urban basin. *Atmospheric Chemistry and Physics* 18:8529-8547. <https://doi.org/10.5194/acp=18-8529-2018>.
498. Mancuso, C.J., and J.R. Ehleringer. 2019. Resident and non-resident fingernail isotopes reveal diet and travel patterns. *Journal of Forensic Sciences* 64:77-87. <https://doi.org/10.1111/1556-4029.13856>
499. Sage, R.F., R.K. Monson, J.R. Ehleringer, S. Adachi, and R.W. Pearcy. 2018. Some like it hot: the physiological ecology of C₄ plant evolution. *Oecologia* 187:941-966. <https://doi.org/10.1007/s00442-018-419>.
500. Ehleringer, J.R., and D.R. Sandquist. 2018. A tale of ENSO, PDO, and increasing aridity impacts on drought-deciduous shrubs in the Death Valley Region. *Oecologia* 187:879-895. <https://doi.org/10.1007/s00442-018-4200-9>.
501. Domingues, T.F., J.P.H.B. Ometto, D.C. Nepstad, P.M. Brando, L.A. Martinelli, and J.R. Ehleringer. 2018 Ecophysiological plasticity of Amazonia trees to long-term drought. *Oecologia* 187:933-940. <https://doi.org/10.1007/s00442-018-4195-2>.
502. Tipple, B.J., and J.R. Ehleringer. 2018. Distinctions in heterotrophic and autotrophic-based metabolism as recorded in the hydrogen and carbon isotope ratios of *normal*-alkanes. *Oecologia* 187:1053-1075. <https://doi.org/10.1007/s00442-018-4189-0>.
503. Smith, R.M., J.C. Williamson, D.E. Pataki, J.R. Ehleringer, and P. Dennison. 2018. Soil carbon and nitrogen accumulation in residential lawns of the Salt Lake Valley, Utah. *Oecologia* 187:1107-1118. <https://doi.org/10.1007/s00442-018-4194-3>.
504. Szejner, P., D. Meko, W.E. Wright, S. Belmecheri, S. Leavitt, J.R. Ehleringer, and R.K. Monson. 2018. Disentangling seasonal and interannual lag effects on forest water demand and carbon assimilation using tree-ring isotopes. *Global Change Biology* <https://doi.org/10.1111/gcb.14395>.
505. Mancuso, C.J., and J.R. Ehleringer. 2019. Traveling there and back again: a fingernail's tale. *Journal of Forensic Sciences* 64:69-76. <https://doi.org/10.1111/1556-4029.13852>.
506. Mancuso, C.J., and J.R. Ehleringer. 2018. Strontium isotope ratios (⁸⁷Sr/⁸⁶Sr) of human fingernail clippings reveal multiple location signals. *Rapid Communications in Mass Spectrometry* 32:1922-1930. <https://doi.org/10.1002/rcm.8270>.
507. Lin, J., L. Mitchell, E. Crossman, D. Mendoza, M. Buchert, R. Bares, B. Fasoli, D. Bowling, D. Pataki, D. Catherine, C. Strong, K. Gurney, R. Patarasuk, M. Baasandorj, A. Jacques, S. Hoch, J. Horel, and J.R. Ehleringer. 2018. CO₂ and carbon emissions from cities: linkages to air quality,

- socioeconomic activity and stakeholders in the Salt Lake City urban area. *Bulletin of the American Meteorological Society* <https://doi.org/0.1175/BAMS-D-17.0037.1>.
508. Cogley, L.A.E., D.E. Pataki, H.R. McCarthy, S.A. Martin, and J.R. Ehleringer. 2018. Building housing age and affluence influence plant and soil carbon and nitrogen in two semi-arid cities. *Journal of Geophysical Research Biogeochemistry* 123:3178-3192. <https://doi.org/10.1029/2018JG004424>.
509. Tipple, B.J., L.O. Valenzuela, T.H. Chau, L. Hu, C.P. Bataille, L.A. Chesson, and J.R. Ehleringer. 2019. Strontium isotope ratios of human hair from the United States: patterns and aberrations. *Rapid Communications in Mass Spectrometry* 33:461-472. <https://doi.org/10.1002/rcm.8378>.
510. Trammel, T., D.E. Pataki, C. Still, Christopher; J.R. Ehleringer, M. Avolio, N. Bettez, J. Cavender-Bares, P. Groffman, M. Grove, S. Hall, J. Heffernan, James, S. Hobbie, K. Larson, J. Morse, C. Neill, K. Nelson, J. O'Neil-Dunne, W. Pearse, R. Roy Chowdhury, M. Steele, and M. Wheeler. 2019. Biophysical and social factors control the distribution of C₄ plants in residential lawns across seven U.S. cities. *Ecological Applications* 29(4):e01884. <https://doi.org/10.1002/eap.1884>.
511. Bares, R., L. Mitchell, B. Fasoli, D. Catherine, M. Garcia, B. Eng, J.R. Ehleringer, and J. Lin. 2019. The Utah carbon dioxide network (UUCON) and Uintah Basin greenhouse networks: instrumentation, data, and measurement uncertainty. *Atmospheric Measurement Techniques* 11:1291-1308. <https://doi.org/10.5194/essd-11-1291-2019>.
512. Szejner, P., S. Belmecheri, J.R. Ehleringer, and R.K. Monson. 2019. Increasing drought frequency causes multi-year legacies in semi-arid forests. *Oecologia* 192:241-259. <https://doi.org/10.1007/s00442-019-04550-6>.
513. Driscoll, A.W., J.D. Howa, N.Q. Bitter, and J.R. Ehleringer. 2019. Oxygen stable isotopes of α -cellulose verify origins of roasted coffee beans. *Rapid Communications in Mass Spectrometry* 34(7): e8626. <http://doi.org/10.1002/rcm.8626>.
514. Valenzuela, L.O., L.A. Chesson, G. Bowen, T.E. Cerling, and J.R. Ehleringer. 2020. Spatial distribution of stable isotopes values of human hair: tools for region of origin and travel history assignment. In R. Parra, S.C. Zapico, and D.H. Ubelaker (editor), *Forensic science and humanitarian action: Interacting with the dead and the living*. John Wiley & Sons Ltd., New York. <https://doi.org/10.1002/9781119482062.ch25>.
515. Bitter, N.Q., D. Fernandez, A.W. Driscoll, J.D., Howa, and J.R. Ehleringer. 2020. Distinguishing the region-of-origin of roasted coffee beans with trace element ratios. *Journal of Food Science* 320: 126602, <https://doi.org/10.1016/j.foodchem.2020.126602>.
516. Nardoto, G.B., J.P. Sena-Souza, T.B. Kisaka, F.J. Viana Costa, P.J. Duarte-Neto, J.R. Ehleringer, and L.A. Martinelli. 2020. Increased carbon isotope ratios of Brazilian fingernails are correlated with increases in socioeconomic status. *npj Science of Food* 4:9. <https://doi.org/10.1038/s41538-020-0069-1>.
517. Driscoll, A.W., N.Q. Bitter, D.R. Sandquist, and J.R. Ehleringer. 2020. Multi-decadal records of intrinsic water-use efficiency in the desert shrub *Encelia farinosa* reveal strong responses to climate change. *Proceedings of the National Academy of Sciences USA* 117:18161-18168.

<https://DOI.org/10.1073/pnas.2008345117> .

518. Ehleringer, J.R., S. Covarrubias, B.J. Tipple, L.O. Valenzuela, and T. E. Cerling. 2020. Stable isotopes in hair reveal dietary protein sources with links to socioeconomic status and health across the United States. *Proceedings of the National Academy of Sciences USA* 117:20044-20051. <http://doi.org/10.1073/pnas.1914087117>.
519. Kannenberg, S., R.E. Fiorella, W. Anderegg, R. Monson, and J.R. Ehleringer. 2020. Seasonal and diurnal trends in progressive isotope enrichment along needles in two pine species. *Plant Cell and Environment* 44:43-55. <https://doi.org/10.1111/pce.13915>
520. Driscoll, A.W., N.Q. Bitter, and J.R. Ehleringer. 2021. Interactions among intrinsic water-use efficiency and climate influence growth and flowering in a common desert shrub. *Oecologia* <https://doi.org/10.1007/s00442-020-04825-3>.
521. Hambach, B., B.J. Tipple, and J.R. Ehleringer. 2021. Cuticular leaf wax concentrations and distributions of common flora of the Colorado Plateau, Great Basin, and Mojave Deserts. *PANGAEA* <https://doi.org/10.1594/PANGAEA.931950>.
522. Bitter, N.Q., and J.R. Ehleringer. 2021. Machine learning prediction of mortality in the common desert shrub *Encelia farinosa*. *Ecological Informatics* 64: <https://doi.org/10.1016/j.ecoinf.2021.101376>
523. Driscoll, A.W., S.A. Kannenberg, and J.R. Ehleringer. 2021. Long-term nitrogen isotope dynamics in *Encelia farinosa* reflect plant demographics and climate. *New Phytologist* <https://doi.org/10.1111/nph.17668>
524. Valenzuela, L.O., S.P. O'Grady, and J.R. Ehleringer. 2021. Variations in human body water isotope composition across the United States. *Forensic Science International* <https://doi.org/j.forsciint.2021.110990> (in press)

Manuscripts in review:

Fiorella, R.P., S.A. Kannenberg, W.R.L. Anderegg, R.K. Monson, and J.R. Ehleringer. Heterogeneous isotope effects decouple conifer leaf and phloem sugar $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$. *Oecologia*

Mancuso, C.J., C.M. Cornwall, S. Robinson, L.O. Valenzuela, and J.R. Ehleringer. Breath stable isotope analysis serves as a non-invasive analytical tool to demonstrate dietary changes in adolescent students over time. *Frontiers in Medicine*

Mitchell, L., et al. (31 authors). A multi-city urban atmospheric greenhouse gas measurement data synthesis. *Scientific Data*

Patents:

Podlesak, D., J.R. Ehleringer, and T.E. Cerling. Device and system to reconstruct travel history of an individual. U.S. Patent No. US20110125413A1, May 26, 2011.

Ehleringer, J.R., L. Chesson, R. Dunn, J.H. Ehleringer, P. Shea, and B.J. Tipple. Cannabis cultivation test. U.S. Patent No. 20170299564, October 19, 2017.

Undergraduate, Staff, Graduate, and Postgraduate Training:

Current postdocs:

Rich Fiorella
Steve Kannenberg

Incredible staff (current):

Sagarika Banerjee
Suvankar Chakraborty
Ming Li
Laurie Mecham

Incredible staff (previous):

Ryan Bares
Janet Barnette
Nic Bitter
Thuan Chau
Lesley Chesson
Craig Cook
Tamsie Cooper
Kim Davis
Christine Doman
Avery Driscoll
Brad Erkkila
Lisa Fleisher
Lindy Funaki
Bastian Hambach
John Howa
Janet Hurley
Julie Johnsson
Lori Long
Michael Lott
Crystal Mancuso-Smith
Shela Patrickson
Sue Phillips
Heather Rasmussen
Leah Richardson
Andy Schauer
Beth Blackmore Sherrill
Erik Stange
Brett Starr

Masters students:

Lesley Chesson
Lori Ducharme
Sylvia Englund
Jillian Gregg
Erin Hanlon
Brett Hesla
Susan Kammerdiener
Susan Phillips
Mark Smedley
Jebediah Williamson

Ph.D. students:

Susan Bush
Jonathan Comstock
Tomas Domingues
Lisa Donovan
Irwin Forseth
Qin-nong Aaron Fu
Brent Helliker
Christy Mancuso
Darren Sandquist
Kenneth Werk
Adam West

Previous undergraduates:

Kelly Burtsch
Creed Clayton
Stephannie Covarrubias
Lindsey Enright
Mindy Fuller-Holbrook
Donna House
Megann Hunter
Ka-Voka (Simone) Jackson
Tim Jackson
Suzanne Khachaturyan
Steve Klassen
Jamie Mausberg
Kevin Rapp
Sean Schaeffer
Jed Sparks
Lynda Sperry
Kathleen Treseder
Erik Wettstein
Elizabeth Young

Previous postdoctoral associates:

Julietta Aranibar
Lynda Ayliffe
Melissa Berke
Gabriel Bowen
David Bowling
J. Renee Brooks
Susan Bush
Nina Buchmann
Jonathan Comstock
Todd Dawson
Henrique Duarte
Jeffrey Dukes
R. David Evans
Julianna Fessenden
Lawrence Flanagan
Renate Gebauer
Peter Harley
Kevin Hultine
Wen-yuan Kao
Helen Kreuzer-Martin
Chun-Ta Lai
Shenggong Li
Guanghai Lin
John Marshall
Daniel Mendoza
Logan Mitchell
Shannon O'Grady
Jean P.H.B. Ometto
Diane Pataki
David Podlesak
John Roden
William Schuster
Susan Schwinning
Matt Sponheimer
Francisco Squeo
Alexandra Thompson
Brett Tipple
Luciano Valenzuela
Julia Verville
Joy Ward
Jason West
David Williams