BRETT JAMES TIPPLE

INSTITUTE OF MARINE SCIENCES

CONTACT INFORMATION

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APPOINTMENTS

UNIVERSITY OF CALIFORNIA, SANTA CRUZ — SANTA CRUZ, CA

Associate Project Scientist, Institute of Marine Sciences — 2017 – Present

- Established alliances between researchers with unidentified yet common research goals.
- Helped secured over US$900k in research and instrumentation funding.

UNITED STATES GEOLOGICAL SURVEY — SANTA CRUZ, CA

Affiliate Scientist, Pacific Coastal and Marine Science Center — 2017 – Present

- Executed novel geochemical approaches to complex problems of national importance.
- Developed geochemical protocols for Center's wildfire and landslide responses.

UNIVERSITY OF UTAH — SALT LAKE CITY, UT

Research Assistant/Adjunct Professor, Department of Biology — 2010 – Present

- Formed an interdisciplinary research group focused on modern and ancient ecology.
- Taught over 300 students leading-edge techniques on state-of-the-art instrumentation.
- Provided guidance on academic committees of 3 undergraduate and 4 graduate students.

Postdoctoral Researcher, Department of Biology — 2009 – 2010

- Contributed to a cutting-edge geospatial chemical methods and products.

ISOFORENSICS, INC. — SALT LAKE CITY, UT

Senior Research Scientist — 2011 – 2016

- Implemented innovative analytical applications for targeted forensic questions.
- Analyzed evidence from over 100 active homicide and cold case investigations.

Research Scientist — 2009 – 2011

- Pioneered analytical and forensic methodologies for the food industry and intelligence community.

EDUCATION

YALE UNIVERSITY — NEW HAVEN, CT

Doctor of Philosophy, Geology and Geophysics — 2009
Master of Philosophy, Geology and Geophysics — 2005

INDIANA UNIVERSITY — BLOOMINGTON, IN

Bachelor of Science with Distinction, Geological Sciences — 2003

TEACHING

UNIVERSITY OF UTAH — SALT LAKE CITY, UT

Instructor, Stable Isotope Biogeochemistry and Ecology (BIOL 7475) — 2010 – 2017
Instructor, Isotopes in Large-Scale Environmental Research (GEO 7476) — 2016
Lecturer, Stable Isotope Biogeochemistry and Ecology (BIOL 7475) — 2015
Instructor, Individual Undergraduate Research (BIOL 4955) — 2011, 2012

YALE UNIVERSITY — NEW HAVEN, CT

Laboratory Leader (Teaching Fellow Level II), Mineralogy and Petrology — 2008
Part-time Acting Instructor, Introduction to Geochemistry — 2006
Discussion Section Leader (Teaching Fellow Level II), Global Environmental Change — 2005
Grader/Tutor (Teaching Fellow Level I), Introduction to Geochemistry — 2004

INDIANA UNIVERSITY — BLOOMINGTON, IN

Student Teacher (7th grade Earth Science), School of Education — 1998

ADVISING

Postdoctoral Researchers:

Jennifer E. Johnson, University of Arizona, 2014 – 2016
Melissa A. Berke, University of Utah, 2011 – 2013

Graduate Student Committees:

Lehai Hu (M.S./Ph.D., Geology and Geophysics) University of Utah, M.S. 2015/Ph.D. *2019*
Clement Bataille (Ph.D., Geology and Geophysics) University of Utah, 2014
Thuan Chau (P.S.M., Environmental Science) University of Utah, 2013

Graduate Student Research-in-Residence Advisees:

Amanda L.D. Bender (Ph.D., Earth and Planetary Science) Washington University in St. Louis, 2016
Tiffany B. Saul (Ph.D., Anthropology) University of Tennessee, Knoxville, 2016

Graduate Student Mentees:

Natasha L. Vokhshoori (Ph.D., Ocean Sciences) UC Santa Cruz, *expected* 2021
Christy J. Mancuso (Ph.D., Biology) University of Utah, 2018
Yusuf Jameel (Ph.D., Geology and Geophysics) University of Utah, 2017

Undergraduate Thesis Mentees:

Alexander Bailess (B.S., Marine Biology) UC Santa Cruz, *expected* 2020
Jade MacMillan (B.S., Earth Science) UC Santa Cruz, *expected* 2019
Laurel Teague (B.S., Earth Science) UC Santa Cruz, *expected* 2019
Elizabeth Young (B.S., Biology) University of Utah, 2014
Stephannie Covarrubias (B.A. [Honors], Biology) University of Utah, 2014
Susanna Khachaturyan (B.S., Biology) University of Utah, 2012
Yasmeen Hussain (B.S. [Honors], Mathematics; Biology) University of Utah, 2012

Katherine French (B.S., Chemistry) Yale University, 2009
Sara Enders (B.S., Geology and Geophysics) Yale University, 2006
Jennifer Haghpanah (B.S., Chemistry; B.A., Mathematics) Quinnipiac University, 2005

COMMUNITY OUTREACH AND SERVICE

Judge for student presentations at the 10th Biennial Bay-Delta Science Conference (September, 2018).

Presented lecture on forensic applications of stable isotopes at the Salt Lake Valley Law Enforcement Administrators and Directors (LEADS) (March, 2018).

Judge for the Outstanding Student Paper Award with the Paleoceanography and Paleoclimate Focus Group at the American Geophysical Union Meeting (December, 2011-2014; 2016).

Presented lectures at the Salt Lake Unified Police Department's *Cold Case Summit* (June, 2014; May 2016).

Mentor for Salt Lake City Public Schools Science Fair (2012, 2013).

Presented petroleum geochemistry and oil spill forensics talk at a community forum following a large oil spill within Salt Lake City (2010).

Co-author of layman's article on stable isotopes for *Bee Culture* Magazine (2010).

Judge for New Haven Public Schools Science Fair (2008).

Organizer for Geological History of Connecticut Field Trip, Department of Geology & Geophysics, Yale University, (2004).

Mentor for Armonk, NY High School Science Program (2004, 2005).

Recruiter for Department of Geology & Geophysics, Geological Society of America Annual Meeting (November, 2004, 2005, 2006); American Geophysical Union Annual Meeting (December, 2004, 2006, 2007).

SYNERGISTIC ACTIVITIES

Rapporteur and Agreement Holder Representative: Implementation of Nuclear Techniques to Improve Food Traceability Systems (CRP D52037), Research Coordination Meeting 4, Department of Nuclear Science and Applications, Joint FAO/International Atomic Energy Agency Division of Nuclear Techniques in Food and Agriculture (November, 2015; November, 2016).

Faculty Affiliate for the Global Change and Sustainability Center, University of Utah (2013 – Present**).**

Organized and Co-chaired: 25g. *Plant Compounds and their Isotope Ratios as Ecohydrological Tracers*, Goldschmidt Conference (June, 2014).

Organized and Co-chaired: PP12B. *New Approaches to Cenozoic Terrestrial Ecosystem and Climate Reconstructions*, American Geophysical Union Fall Meeting (December, 2009).

Peer Referee for *Earth and Planetary Science Letters; Food Chemistry; Geochimica et Cosmochimica Acta; Geology; Geochemistry, Geophysics, Geosystems; Nature; Nature*

Geoscience; Organic Geochemistry; Quaternary Science Reviews; The Proceedings of the National Academy of Science of the United States of America; Plant, Cell and Environment; PLOS One; Rapid Communications in Mass Spectrometry; Sedimentology.

Proposal Reviewer for the National Science Foundation (EAR, BIO, OCE, CAREER), Chilean Fondo Nacional de Desarrollo Cietífico y Tecnológico, National Institute of Justice, Sigma Xi, the Geological Society of America, and the National Geographic Society.

PUBLICATIONS

Peer-Reviewed Scientific Journals and Book Chapters
([#]Postdoctoral Researcher author, [*]Graduate Student author, [§]Undergraduate Student author)

40. [*]Bender, A.L.D., **Tipple, B.J.**, and Bradley, A.S. (*Submitted*) Investigating species-specific differences in hydrogen isotopic compositions of leaf wax alkanes among Solanum species that differ in drought tolerance, *Organic Geochemistry*.

39. Svečnjak, L., Chesson, L.A., Gallina, A., Maia, M., Martinello, M., Mutinelli, F., Necati Muz, M., Nunes, F., Özdemir, N., Saucy, F., **Tipple, B.J.**, Wallner, K., Waś, E., and Waters, T., (*In Press*) Standard methods for *Apis mellifera* beeswax research, *Journal of Apicultural Research*. DOI:10.1080/00218839.2019.1571556

38. **Tipple, B.J.**, Valenzuela, L.O., [*]Chau, T.H., [*]Hu, L., [*]Bataille, C.P., Chesson, L.A., and Ehleringer, J.R. (2019) Strontium isotope ratios of human hair from the United States: Patterns and aberrations, *Rapid Communications in Mass Spectrometry*, 33, 5, 461-472.

37. [*]Jameel, Y., Brewer, S., Fiorella, R.P., **Tipple, B.J.**, Terry, S., and Bowen G.J. (2018) Isotopic reconnaissance of urban water supply system dynamics, *Hydrology and Earth System Sciences*, 22, 6109-6125.

36. Chesson, L.A., Barnette, J.E., Bowen, G.J., Brooks, J.R., Casale, J.F., Cerling, T.E., Cook, C.S., Douthitt, C.B., Howa, J.D., Hurley, J.M., Kreuzer, H.W., Lott, M.J., Martinelli, L.A., O'Grady, S.P., Podlesak, D.W., **Tipple, B.J.**, Valenzuela, L.O., and West, J.B. (2018) Stable isotope analysis in plant and animal ecology – with application to forensic science in the Americas, *Oecologia*, 187, 1077-1094.

35. Chesson, L.A., **Tipple, B.J.**, Youmans, L.V., O'Brian, M.A., and Harmon, M.M., (2018) Forensic identification of human skeletal remains using isotopes: A brief history of applications from archaeological dig sites to modern crime scenes, (Eds) Latham, K. Bartelink, E.J. Finnegan, M., *New Perspectives in Forensic Human Skeletal Identification*, 1st Edition, pp. 157-173. Academic Press, London, UK. ISBN: 978-0-128-05429-1.

34. Bartelink, E.J., Berg, G.E., Chesson, L.A., **Tipple, B.J.**, Beasley, M.M., Prince-Buitenhuys, J.R., MacInnes, H., MacKinnon, A.T., and Latham, K., (2018) Applications of stable isotope forensics for geolocating unidentified human remains from past conflict situations and large-scale humanitarian efforts, (Eds) Latham, K. Bartelink, E.J. Finnegan, M., *New Perspectives in Forensic Human Skeletal Identification*, 1st Edition, pp. 175-184. Academic Press, London, UK. ISBN: 978-0-128-05429-1.

33. Chesson, L.A., **Tipple, B.J.**, Ehleringer, J.E., Parks, T., and Bartelink, E.J. (2018) Forensic applications of isotope landscapes ("isoscapes"): A tool for predicting region-of-origin in

forensic anthropology cases, (Eds) Boyd, D, Boyd, C., *Forensic Anthropology: Theoretical Framework and Scientific Basis*, 356 pages. John Wiley & Sons Limited, London, UK. ISBN: 978-1-119-22638-3.

32. **Tipple, B.J.** and Ehleringer, J.R., (2018) Distinctions in heterotrophic and autotrophic-based metabolism as recorded in the hydrogen and carbon isotope ratios of *normal*-alkanes, *Oecologia*, 187, 1053-1075.
31. **Tipple, B.J.**, Valenzuela, L.O., and Ehleringer, J.R. (2018) Strontium isotope ratios of human hair record intra-city variations in tap water source, *Scientific Reports*, 8, 2224, doi:10.1038/s41598-018-21359-0.
30. Chesson, L.A., **Tipple, B.J.**, Chakraborty, S., and Rogers, K. (2017) Odds and Ends, (Eds) Carter, J.F., Chesson, L.A., *Food Forensics: Stable Isotopes as a Guide to Authenticity and Origin*, 352 pages. CRC Press, Boca Raton, FL. ISBN: 978-1-498-74172-9.
29. Chesson, L.A., Bartelink, E.J., **Tipple, B.J.**, Cerling, T.E., and Ehleringer, J.E. (2017) Forensic applications of isotope geochemistry: Linking materials to individuals, locations, and times, (Ed) Bergslien, E., *Forensics Geoscience: Advances and Applications*, American Geophysical Union Press. ISBN: 978-1-119-05390-3.2.
28. **Tipple, B.J.**, *Jameel, Y., *Chau, T.H., *Mancuso, C.J., Bowen, G.J. Dufour, A., Chesson, L.A., and Ehleringer, J.R. (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.
27. Bartelink, E.J., Mackinnon, A.T., Prince-Buitenhuys, J.R., **Tipple, B.J.**, and Chesson, L.A. (2016) Stable isotope forensics as an investigative tool in missing person investigations, (Eds) Morewitz, S.J., Sturdy-Colls, C., *Handbook of Missing Persons*, pp. 443-462, Springer International Publishing. New York, New York. ISBN: 978-3-319-40197-3.
26. *Chau, T.H., **Tipple, B.J.**, *Hu, L., Fernandez, D., Cerling, T.E., Chesson, L.A., and Ehleringer, J.R. (2017) Reconstruction of travel history using coupled $\delta^{18}O$ and $^{87}Sr/^{86}Sr$ measurements of hair, *Rapid Communications in Mass Spectrometry*, 31, 6, 1-8.
25. *Jameel, Y., Brewer, S., Good, S.P., **Tipple, B.J.**, Ehleringer, J.R., and Bowen, G.J. (2016) Spatiotemporal variation in the tap water isotope ratios of Salt Lake City: a novel indicator of urban water system structure and dynamics, *Water Resources Research*, 52, 8, 1-20.
24. Ehleringer, J.R., Barnette, J.E., *Jameel, Y., **Tipple, B.J.**, and Bowen, G.J. (2016) Urban water – A new frontier in isotope hydrology, *Isotopes in Environmental and Health Studies*, 52, 4-5, 477-486.
23. Cerling, T.E., Barnette, J.E., Bowen, G.J., Chesson, L.A., Ehleringer, J.R., Remien, C.H., Shea, P.A., **Tipple, B.J.**, and West, J.B. (2016) Forensic stable isotope biogeochemistry, *Annual Reviews of Earth and Planetary Sciences*, 44, 175-206.
22. **Tipple, B.J.**, Hambach, B., Barnette, J.E., Chesson, L.A., and Ehleringer, J.R. (2016) The influences of cultivation method on inflorescence lipid distributions, concentrations, and carbon isotope ratios of *Cannabis sp.*, *Forensic Science International*, 262, 233-241.

21. [#]Berke, M.A., **Tipple, B.J.**, Hambach, B., and Ehleringer, J.R. (2015) Life-form specific gradients in compound specific δ^2H of modern leaf waxes along a North American Monsoonal transect, *Oecologia*, 179, 4, 981-997.

20. Ehleringer, J.R., Chesson, L.A., Valenzuela, L.O., **Tipple, B.J.**, and Martinelli, L.A., (2015) Humans and Society – Amazing insights from stable isotope biogeochemistry, *Elements*, 11, 4, 259-264.

19. **Tipple, B.J.**, [#]Berke, M.A., Hambach, B., Roden, J.S., and Ehleringer, J.R. (2015) 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, 6, 1035-1047.

18. Chesson, L.A., **Tipple, B.J.**, Barnette, J.E., Cerling, T.E., and Ehleringer, J.R. (2015) The potential for application of ink stable isotope analysis in questioned document examination, *Science & Justice*, 55, 1, 27-33.

17. Chesson, L.A., **Tipple, B.J.**, Howa, J.D., Bowen, G.J., Barnette, J.E., Cerling, T.E., and Ehleringer, J.R. (2014) Stable Isotopes in Forensics Applications, *Treatise on Geochemistry*, 2nd Edition, Volume 14, pp. 285-317.

16. [*]Bataille, C., Mastalerz, M. **Tipple, B.J.**, and Bowen, G.J. (2013) Influence of organic provenance and preservation on the carbon isotope variations of dispersed organics in ancient floodplain sediments, *Geochemistry, Geophysics, Geosystems*, 14, 11, 4874-4891.

15. **Tipple, B.J.**, [*]Chau, T.H., Chesson, L.A., Fernandez, D., and Ehleringer, J.R. (2013) Isolation of the strontium pools and isotope ratios in modern human hair, *Analytica Chimica Acta*, 798, 1, 64-73.

14. Chesson, L.A., **Tipple, B.J.**, Erkkila, B.R., and Ehleringer, J.R. (2013) Hydrogen and oxygen stable isotope analysis of pollen collected from honey, *Grana*, 52, 4, 305-315.

13. **Tipple, B.J.** and Pagani, M. (2013) Environmental control on eastern broadleaf forest species' leaf wax distributions and D/H ratios, *Geochimica et Cosmochimica Acta*, 111, 1, 64-77.

12. Dirghangi, S.S., Pagani, M., Hren, M.T., and **Tipple, B.J.** (2013) Distribution of glycerol dialkyl glycerol tetraethers in soils from two environmental transects in the USA, *Organic Geochemistry*, 59, 1, 49-60.

11. **Tipple, B.J.**, [#]Berke, M.A., [§]Doman, C.E., [§]Khachaturyan, S. and Ehleringer, J.R. (2013) Leaf *n*-alkane record the plant-water environment at leaf flush, *The Proceedings of the National Academy of Sciences*, 110, 7, 2659-2664.

10. Chesson, L.A., **Tipple, B.J.**, Mackey, G.N., Fernandez, D., and Ehleringer, J.R. (2012) Strontium isotope ratios of tap water from the coterminous USA, *Ecosphere*, 3, 7, Article 67.

9. **Tipple, B.J.**, Chesson, L.A., Erkkila, B., Ehleringer, J.R., and Cerling, T.E. (2012) B-HIVE: Beeswax Hydrogen Isotopes as Validation of Environment Part II. Compound-specific hydrogen isotope analysis, *Food Chemistry*, 134, 1, 494-501.

8. **Tipple, B.J.**, Pagani, M., Krishnan, S., Dirghangi, S.S., Galeotti, S., Agnini, C., Giusberti, L., and Rio, D. (2011) Coupled high-resolution marine and terrestrial records of carbon and

hydrologic cycles variations during the Paleocene-Eocene Thermal Maximum (PETM), *Earth and Planetary Science Letters*, 311, 1-2, 82-92.

7. Chesson, L.A., **Tipple, B.J.**, Erkkila, B., Ehleringer, J.R., and Cerling, T. (2011) B-HIVE: Beeswax Hydrogen Isotopes as Validation of Environment Part I. Bulk honey and honeycomb stable isotope analysis, *Food Chemistry*, 125, 2, 576-581.
6. **Tipple, B.J.** and Pagani, M. (2010) A 35 Myr terrestrial higher plant *n*-alkane stable carbon and hydrogen isotope record from the Gulf of Mexico: Implications for North American C_4 grasslands and hydrologic cycle dynamics, *Earth and Planetary Science Letters*, 299, 1-2, 15, 250-262.
5. **Tipple, B.J.**, Meyers, S.R., and Pagani, M. (2010) The carbon isotope ratio of Cenozoic CO_2: a comparative evaluation of available geochemical proxies, *Paleoceanography*, 25, PA3202, doi:10.1029/2009PA001851.
4. Edwards, E.J., Osborne, C.P., Strömberg, C.A.E., Smith, S.A., Bond, W.J., Christin, P.-A., Cousins, A.B., Duvall, M.R., Fox, D.L., Freckleton, R.P., Ghannoum, O., Hartwell, J., Huang, Y., Janis, C.M., Keeley, J.E., Kellogg, E.A., Knapp, A.K., Leakey, A.D.B., Nelson, D.M., Saarela, J.M., Sage, R.F., Sala, O.E., Salamin, N., Still, C.J., and **Tipple, B.J.** (2010) The origins of C_4 grasslands: Integrating evolutionary and ecosystem science, *Science*, 328, 5978, 587-591.
3. Pedentchouk, N., Sumner, W., **Tipple, B.J.**, and Pagani, M. (2008) $\delta^{13}C$ and δD Composition of *n*-alkanes from modern angiosperms and conifers: An experimental set-up in central Washington state, USA, *Organic Geochemistry*, 39, 8, 1066-1071.
2. **Tipple, B.J.** and Pagani, M. (2007) The early origins of terrestrial C_4 photosynthesis, *Annual Reviews of Earth and Planetary Sciences*, 35, 435-461.
1. Pagani, M., Zachos, J., Freeman, K.H., **Tipple, B.J.**, and Bohaty, S. (2005) Marked change in atmospheric carbon dioxide concentrations during the Oligocene, *Science*, 309, 600-603.

Technical Reports

3. **Tipple, B.J.** (2016) Isotope analyses of hair as a trace evidence tool to reconstruct human movements: Establishing the effects of the "Human Ecosystem" on strontium and oxygen isotope ratios, Department of Justice, National Criminal Justice Reference Service, Document Number 250339, 92 pages.
2. Chesson, L.A., Howa, J.D. and **Tipple, B.J.** (2016) Isotope testing of heroin for provenancing, United Nations Office on Drugs and Crime, 9 pages.
1. **Tipple, B.J.** (2014) Isotope analyses of hair as a trace evidence tool to reconstruct human movements: combining strontium isotope with hydrogen/oxygen isotope data, Department of Justice, National Criminal Justice Reference Service, Document Number 248977, 51 pages.

Non-Peer Reviewed Contributions

4. Cook, C.S., Erkkila, B., Chakraborty, S., **Tipple, B.J.**, Cerling, T.E., and Ehleringer, J.R. (2017) Stable Isotope Biogeochemistry and Ecology: Laboratory Manual, *Amazon Independently Published*, 181 pages, ISBN-10: 1973349086/ISBN-13: 978-1973349082.

3. **Tipple, B.J.** and Ehleringer, J.R. (2016) Carbon isotopes — The chemist's tool to trace marijuana cultivation environment, *Atlas of Science*, http://bit.ly/2eY44xm.
2. **Tipple, B.J.** (2013) Capturing climate variability during our ancestors' earliest days, *The Proceedings of the National Academy of Sciences*, 110, 4, 1144-1145.
1. Chesson, L.A. and **Tipple, B.J.** (2010) The isotope waggle dance: how the honey bee communicates with the chemist, *Bee Culture*, 183, 8, 30-32.

Publications in Progress

3. Rickaby, R.E.M., **Tipple, B.J.**, and Erez, J. (*In Preparation*) The evolution of carbon isotopic vital effects in planktonic symbiont-bearing foraminifera.
2. [*]Saul, T.B., Chesson, L.A., **Tipple, B.J.**, Steadman, D.W. (*In Preparation*) An exploration of the effects of taphonomy on the isotope ratios of human hair.
1. [§]Covarrubias Avalos, S., Valenzuela, L.O., **Tipple, B.J.**, Chesson, L.A., and Ehleringer, J.R. (*In Preparation*) The distributions and relationships of carbon and nitrogen isotopes in human hair with socioeconomic factors in the Salt Lake Valley, Utah.

RESEARCH GRANTS

Funded Proposals (total = $2.81 million)

California Department of Fish and Wildlife/Delta Stewardship Council: Prop 1 - Watershed and Delta Ecosystem Restoration Grant Programs, $313,413.86 (*Pending*), PI: **B.J. Tipple**, co-PI: M.D. McCarthy, "Developing a new molecular isotopic tool to examine Delta food webs."

National Science Foundation: OCE 1828774, $564,184 (10/1/2019-9/30/2020), PI: M.D. McCarthy, co-PIs: V. Oelze, D. Costa, A.C. Ravelo, P.Koch, Collaborator: **B.J. Tipple**. "MRI: Acquisition of an Isotope Ratio Mass Spectrometer for Compound-Specific Applications in Biogeochemistry and Environmental Studies at UC Santa Cruz."

US Geological Survey: FY18 Priority Ecosystems Science Mid-Year Supplemental Proposals, $30,200 (7/1/2018-6/30/2019), PIs: R. Takesue and **B.J. Tipple**, "Sourcing of sediment and contaminant runoff to the northern reaches of San Francisco Bay from the Atlas and Nuns fires."

Packard Foundation: Ocean Science and Technology Grant, $9,997 (5/15/2018-5/14/2019), PIs: **B.J. Tipple** and M.D. McCarthy, Collaborators: N.G. Prouty, A.R. Stewart. "Development of new molecular tools to understand the biogeochemistry and track change in natural and human-impacted estuaries."

UC Santa Cruz Division of Physical & Biological Sciences: Future Leaders in Coastal Science, $21,272 (2/15/2018-2/14/2019), Student PI: N.L. Vokhshoori, Faculty Advisors: **B.J. Tipple** and M.D. McCarthy, "A window into California's past coastal environments: Compound-specific amino acid isotope ratios from bivalve shells to reconstruct nearshore primary productivity."

National Institute of Justice: NIJ-2016-4305, $270,894.26 (11/1/2016-10/31/2018), PI: L.A. Chesson, co-PI: **B.J. Tipple**. "A comprehensive test of the methods and models used to assign geographic origin to human skeletal remains with stable isotope data."

United States Fish and Wildlife Service, Wildlife without Border – African Elephant Conservation Fund: F15AS00001, $63,523.73 (2/1/2016-1/31/2017), PI: T.E. Cerling, co-PI: **B.J. Tipple**, L.A. Chesson. "Isotopic Verification Of Region & Year (IVORY)."

National Institute of Justice: 2013-DN-BX-K009, $367,399 (10/1/2013-3/31/2016), PI: **B.J. Tipple**. "Isotope analyses of hair as a trace evidence tool to reconstruct human movements: Establishing the effects of the "Human Ecosystem" on strontium and oxygen isotope ratios."

Charles Stark Draper Laboratory, University Research and Development (URAD) Program, $109,736 (7/1/2013-6/27/2014), PI: J.R. Ehleringer, co-PI: **B.J. Tipple**, T.E. Cerling, G.J. Bowen. **"**Hair as a recorder of region-of-origin and travel history."

National Institute of Justice: 2011-DN-BX-K544, $342,000 (9/1/2011-8/31/2014), PI: **B.J. Tipple**. "Isotope analyses of hair as a trace evidence tool to reconstruct human movements: combining strontium isotope with hydrogen/oxygen isotope data."

National Science Foundation: IOS 1052551, $707,500 (4/15/2011-3/31/2015), PI: J.R. Ehleringer, co-PI: **B.J. Tipple**. "Hydrogen isotopes in *n*-alkanes of tree leaves and needles: experimental studies with ecophysiological, ecosystem, climate, and dust-related applications."

Yale University: John F. Enders Fellowship and Research Grant, $2,000 (5/1/2006-9/30/2006), "Tree leaf waxes as environment recorders: An empirical evaluation with paleoclimate applications."

Geological Society of America: Graduate Student Research Grant, $2,500 (5/1/2005-9/30/2005), "(U-Th)/He and fission-track detrital grain double-dating as a paleo-wildfire indicator*:* Implications to the PETM."

Yale Institute of Biospheric Studies: Field Ecology Grant, $2,000 (11/1/2004-10/31/2005), "Establishing the carbon isotope ratio of Paleogene CO_2 from sedimentary charcoal."

SCHOLARSHIPS, FELLOWSHIPS, AND ACADEMIC AWARDS

Best Presentation – FIRMS/Isotope Analysis, ANZFSS International Symposium on the Forensic Sciences, Auckland, New Zealand (2016)

Estwing Hammer Prize, Estwing Manufacturing Corporation/Graduate School of Arts and Sciences, Yale University (2008)

John F. Enders Fellowship & Research Grant, Graduate School of Arts and Sciences, Yale University (2006)

Graduate Student Research Grant, Geological Society of America (2005)

Kenneth N. Weaver Student Travel Award, Northeastern Section of the Geological Society of America (2005)

Graduate Research Fellowship, National Science Foundation (2004-2007)

Graduate Teaching Fellowship, Yale University (2004, 2005, 2008)

Best Undergraduate Research Project Award, Indiana University (2003)

Bill and Jan Cordua Scholarship, Department of Geological Sciences, Indiana University (2003)

William C. Menke Scholarship, Indiana University (2002)

Bill Armstrong/Little 500 Scholarship, Indiana University Student Foundation (2002)

Charles Deiss Memorial Scholarship, Department of Geological Sciences, Indiana University (2001)

Elected Phi Beta Kappa, Indiana University (2001)

PATENTS

Ehleringer, J.R., Chesson, L.A., Dunn, R., Ehleringer, J., Shea, P.A., and **Tipple, B.J.** (2017) *Patent No.* US15491336. Salt Lake City, UT: U.S. Patent and Trademark Office.

PRESENTATIONS

Invited Lectures

Leaf waxes as paleoclimate proxies: The continuing evolution of stable isotope-based methods to reconstruct past terrestrial environments, Department of Geology and Geophysics, Louisiana State University, Baton Rouge, LA (March, 2018).

Stable isotopes of marijuana– A fingerprint of cultivation condition and origin, Salt Lake Valley Law Enforcement Administrators and Directors (LEADS) Meeting, Salt Lake City, UT (March, 2018).

Stable isotopes of cannabis – A powerful new analytical tool, Cannabis Science Conference, Portland, OR (August, 2017).

Stable hydrogen and oxygen isotopes of water: A reservoir of environmental information, School of Natural Sciences, University of California, Merced, Merced, CA (April, 2017).

Crawling onto the land: The evolution of stable isotope-based proxies to reconstruct past terrestrial environments, ConocoPhillips School of Geology and Geophysics, University of Oklahoma, Norman, OK (March, 2017).

Exploring the "human ecosystem" with isotopes of water, Department of Earth and Planetary Sciences, Washington University in St. Louis, St. Louis, MO (December, 2016).

A framework to develop isoscape models for product origin and tracing questions, International Atomic Energy Agency, Research Coordination Meeting for the *Implementation of Nuclear Techniques to Improve Food Traceability Systems*, Vienna, Austria (November, 2016).

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Using isotope analysis to assist in cold case investigations, Cold Case Summit, Unified Police Department of Greater Salt Lake, Salt Lake City, UT (May, 2016).

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Using oxygen and strontium isotopes to dissect a human ecosystem: A spatial and temporal study of water and human hair from Southern California, American Academy of Forensic Sciences, Las Vegas, NV (February, 2016).

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Combining strontium and oxygen isotope ratios of hair for human provenancing. American Academy of Forensic Sciences, Seattle, WA (February, 2014).

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Refining paleoenvironmental proxies from plant leaf waxes, Department of Biology, University of Utah, Salt Lake City, UT (October, 2013).

Isotope analysis of hair as a trace evidence tool to reconstruct human movements. American Academy of Forensic Sciences, Atlanta, GA (February, 2012).

A 35 Myr record of North American grasslands and hydrologic cycle dynamics. Department of Geology, University of Cincinnati, Cincinnati, OH (November, 2011).

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Coupled marine and terrestrial records of carbon cycle variation during the PETM. Department of Geological Sciences, Brown University, Providence, RI (July, 2011).

Fingerprints of oil - how scientists can distinguish one oil from another. Community Lecture Series – The Life of an Urban Stream, Salt Lake City, UT (August, 2010).

Leaf wax compound specific isotope ratios: Insights from the Modern and application to Cenozoic climates and floral dynamics. Distinguish Lecturer Series, Department of Geology and Geophysics, University of Utah, Salt Lake City, UT (February, 2010).

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A Neogene higher plant n-alkane carbon and hydrogen isotope record from the Gulf of Mexico, Conoco-Philips, Houston, TX (December, 2008).

Contributed Presentations ([*]Oral, [#]Poster)

New molecular isotopic tools to understand the modern and past food webs of the San Francisco Bay and Delta[#], Bay/Delta Science Conference, Sacramento, CA (September, 2018).

Combining molecular tools to track San Francisco Bay estuary biogeochemistry in relation to human development of the region[#], Organic Geochemistry – Gordon Research Conference, Holderness, NH (August, 2018).

Tap water isotopes reveal the San Francisco Bay Area's plumbing and responses to a major drought[#], American Geophysical Union, Annual Meeting, San Francisco, CA (December, 2016).

Strontium isotope ratios of human hair from the United States: Trends, Patterns, and Aberrations[#], ANZFSS International Symposium on the Forensic Sciences, Auckland, New Zealand (September, 2016).

Strontium isotope ratios of hair for human provenancing[*], American Academy of Forensic Sciences, Orlando, FL (February, 2015).

Establishing the environmental controls and mechanisms shaping the $^{2}H/^{1}H$ ratios of leaf wax n-alkanes[*], Goldschmidt Conference, Sacramento, CA (June, 2014).

Both water source and atmospheric water impact leaf wax n-alkane $^{2}H/^{1}H$ values of hydroponically grown angiosperm trees[#], American Geophysical Union Annual Meeting, San Francisco, CA (December, 2013).

Combining strontium and oxygen isotope ratios of hair for human provenancing[#], Geological Society of America Annual Meeting, Denver, CO (October, 2013).

Isolation of strontium pools and isotope ratios in modern human hair[#], Forensic Isotope Ratio Mass Spectrometry (FIRMS) Meeting, Montreal, Canada (September, 2013).

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Transpiration and atmospheric water impact the leaf wax n-alkane $^{2}H/^{1}H$ values of hydroponically grown angiosperm trees[#], Organic Geochemistry – Gordon Research Conference, Holderness, NH (August, 2012).

Leaf waxes in riparian trees: hydrogen isotopes and chain-length patterns[#], American Geophysical Union Annual Meeting, San Francisco, CA (December, 2011).

Beeswax Hydrogen Isotopes as Validation of Environment: B-HIVE[*], Forensic Isotope Ratio Mass Spectrometry (FIRMS) Meeting, Washington, DC (April, 2010).

A terrestrial PETM record of variations in carbon and hydrologic cycles from Northern Italy[*], American Geophysical Union Annual Meeting, San Francisco, CA (December, 2009).

Beeswax normal-alkane distributions and hydrogen isotope ratios as geo-location tools[#], IsoCompound Meeting, Potsdam, Germany (May, 2009).

Leaf waxes as a recorder of the hydrogen isotope ratios of precipitation and ground-water: Field data from the California Coastal and Sierra Nevada Ranges[#], IsoCompound Meeting, Potsdam, Germany (May, 2009).

A 35 Myr higher plant n-alkane stable carbon and hydrogen isotope record from the Gulf of

Mexico: Implications to North American C_4 grasslands and hydrologic cycle dynamics[#], Organic Geochemistry – Gordon Research Conference, Holderness, NH (August, 2008).

Orographic and climatic influence on leaf wax carbon and hydrogen isotopic ratios: A field survey from Northern California[#]. American Geophysical Union Annual Meeting, San Francisco, CA (December, 2008).

(*U-Th)/He and Fission-Track detrital grain double-dating as a paleo-wildfire indicator: Trials and tribulations from two Western Interior Basins and implications to the PETM*[*], Geological Society of America Annual Meeting, Denver, CO (October, 2007).

Eliciting climatic controls on leaf wax carbon and hydrogen isotopic ratios: A field study from the eastern US[*], American Chemical Society Annual Meeting, Boston, MA (August, 2007).

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Abstracts

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Bartelink, E.J., Chesson, L.A., **Tipple, B.J.**, Hall, S., and Kramer, R. *Use of stable isotopes to predict region of origin of undocumented border crossers from the US/Mexico Border*, Latin American Association of Anthropology (ALAF), São Paulo, SP, Brazil (October, 2017).

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