

Cristina Castanha is a principal research associate at Lawrence Berkeley National Laboratory and an assistant research scientist at the University of California, Merced. She is an ecologist and biogeochemist who studies the effects of climate change and other anthropogenic influences on vegetative land cover and the terrestrial carbon cycle. For the past six years she has been studying conifer seedling demographics in Colorado's Front Range. And over the past eighteen years she has worked in a variety of locations and on a series of collaborations investigating the controls on carbon cycling in terrestrial ecosystems. Her work uses natural environmental gradients, field experiments, isotope analyses, and laboratory analyses. Cristina holds a B.S. in Fermentation Science from UC Davis (1985), an M.S. in Environmental Systems from Humboldt State University (1992), and a Ph.D. in Energy and Resources from UC Berkeley (2004). At UC Berkeley she served as lecturer in Environmental Sciences and as teaching assistant for a variety of classes including Environmental Problems, Development and Classification of Soils, and Renewable Resources for Electrical Generation.

EDUCATION

- Ph.D. **University of California Berkeley.** Energy and Resources, 2004.
Mineral and Climate Controls on Soil Organic Matter Storage and Cycling.
John Harte (chair), Ronald Amundson, Susan Trumbore, and Richard Norgaard
- M.S. **Humboldt State University.** Environmental Systems, 1994.
The USA/Brazilian Rural Electrification Pilot Program; a technical and economic analysis. Robert Gearhart
- C.S. **Sonoma State University.** Energy Management and Design, 1992.
- B.S. **University of California Davis.** Fermentation Science, Honors, 1985.

RESEARCH AND PROFESSIONAL EXPERIENCE

Principal Research Associate, Earth Sciences Division, LBNL. 2012-present.
Assistant Research Scientist, University of California, Merced 2013-present
Senior Research Associate, Earth Sciences Division, LBNL. 2005-2012.
Assistant Research Scientist, University of California, Berkeley 2008-2013
Lecturer, Environmental Science Senior Research Seminar, UC Berkeley 2004-5.
Outstanding Graduate Student Instructor, UC Berkeley 2001.
GSI, UC Berkeley, 1994-2004: Quantitative Aspects of Environmental Problems (Harte),
Summer Soil Field Course (Amundson/Singer/Dahlgren), Development and Classification of
Soils (Amundson), Field Study of Soil Development (Amundson), Renewable Resources for
Electrical Generation (Morris).
Assistant Winemaker, Michel-Schlumberger Wines. 1985-1991.

PEER REVIEWED PUBLICATIONS

- Castanha C**, MS Torn, MJ Germino, B Weibel, LM Kueppers. 2012. Conifer seedling recruitment across a forest-to-alpine tundra gradient and effects of provenance. *Plant Ecology and Diversity*. DOI:10.1080/17550874.2012.716087.
- Castanha C**, S Trumbore, R Amundson. 2008. Methods of separating soil carbon pools affect the chemistry and turnover time of isolated fractions. *Radiocarbon* 50(1): 83-97.

- Castanha C**, S Trumbore, R Amundson. 2012. Mineral and organic matter characterization of density fractions of basalt- and granite-derived soils in montane California. In: An Introduction to the Study of Mineralogy. Aydinalp C, ed. InTech.
- Hatton, PJ, **C Castanha**, MS Torn, JA Bird. 2015. Litter type control on soil C and N stabilization dynamics in a temperate forest. *Global Change Biology* 21:1358–1367, doi: 10.1111/gcb.12786
- Moyes AB, **C Castanha**, MJ Germino, LM Kueppers. 2012. Warming and the dependence of limber pine (*Pinus flexilis*) establishment on summer soil moisture within and above its current elevation range. *Oecologia*, 171(1): 271-282.
- Reinhardt K, **C Castanha**, MJ Germino, LM Kueppers. 2011. Ecophysiological variation in two provenances of *Pinus flexilis* seedlings across an elevation gradient from forest to alpine. *Tree Physiology*, 31(6): 615-625.
- Torn MS, CW Swanston, **C Castanha**, SE Trumbore. 2009. Storage and turnover of organic matter in soil. LBNL-810E. In: Biophysico-Chemical Processes Involving Natural Nonliving Organic Matter in Environmental Systems, Senesi N, Xing B, and Huang PM, eds., International Union of Pure and Applied Chemistry (IUPAC), New York, NY.
- St. Clair, S, SM Bernard, EA Sudderth, **C Castanha**, MS Torn, D. Ackerly. 2009. Plant responsiveness to soil moisture and nitrogen is consistent across the functional diversity of a California annual grassland. *Journal of Vegetation Science*, 20(5): 860–870.
- Swarbreck SM, EA Sudderth, SB St.Clair, R Salve, **C Castanha**, MS Torn, DD Ackerly, GL Andersen. Linking leaf transcripts levels to whole plant analyses provides mechanistic insights to the impact of warming and altered water availability in an annual grass. 2011. *Global Change Biology*, 17(4): 1577–1594.
- Sudderth EA, SB St.Clair, S Placella, SM Swarbreck, **C Castanha**, DJ Herman, ML Fischer, M Kleber, EB Sudderth, MS Torn, MK Firestone, GL Andersen, DD Ackerly. 2012. Timing of dry periods relative to plant phenological stage has larger impacts on grassland systems than annual rainfall. *Ecosphere*.

PUBLISHED ABSTRACTS

- Castanha C, MJ Germino, B Lazarus, LM Kueppers. Effects of experimental climate warming on seedling growth for three subalpine conifers along a forest to alpine tundra gradient. 99th ESA Annual Convention 2014; 08/2014.
- Lazarus B, MJ Germino, LM Kueppers, C Castanha, AB Moyes. Threshold responses to cold and drought in tree seedlings vary among species at and above alpine treeline, but can they help explain establishment patterns? 99th ESA Annual Convention 2014; 08/2014.
- Zhu B, W Cheng, CY Huang, A Concilio, CE Hicks-Pries, JB Curtis, C Castanha, RC Porras, MS Torn. Rhizosphere priming in response to soil temperature and moisture. 99th ESA Annual Convention 2014; 08/2014.
- Torn MS, B Zhu, CE Hicks-Pries, EL Brodie, C Castanha, JB Curtis, JK Jansson, P Nico, WJ Riley. Looking a little deeper: A new experiment warming forest soil to 1 m deep. 99th ESA Annual Convention 2014; 08/2014.
- Moyes AB, C Castanha, LM Kueppers. Microclimate factors affecting seedling emergence and survival of three conifer species within and above their current elevation ranges: results of a multi-year climate manipulation study in the Colorado Rocky Mountains. 99th ESA Annual Convention 2014; 08/2014.
- Reinhardt K, MJ Germino, LM Kueppers, C Castanha, J Mitton, JC Domec. Whole-plant evidence for mechanisms of drought-induced mortality of *Pinus flexilis* seedlings at their lower-elevation limit. 99th ESA Annual Convention 2014; 08/2014.

Torn, MS, CE Hicks-Pries, B Zhu, J Jansson, E Brodie, P Nico, D Herman, JB Curtis, C Castanha, and Y Zhang. Understanding the response of soil organic carbon to warming throughout the whole soil profile EGU2014-14562.

Hicks-Pries, CE, PJ Hatton, C Castanha, JA Bird, MS Torn. How does litter become soil organic matter? Tracing the fate of needle- and root-derived soil organic matter through 10 years of decomposition. EGU2014-14630.

Torn, MS, N Tas, K Reichl, C Castanha, M Fischer, S Abiven, M Schmidt, E Brodie, J Jansson. The Effect of Soil Warming on Decomposition of Biochar, Wood, and Bulk Soil Organic Carbon in Contrasting Temperate and Tropical Soils EGU2013-6612.

Lim, HC, M Bill, C Castanha, J Ceja-Navarro, MS Conrad, MWI Schmidt, S Abiven, MS Torn, JK Jansson and EL Brodie. 2012. The Role of Actinobacteria in Biochar Decomposition in a Mediterranean Grassland Soil. AGU, General Meeting. San Francisco, CA.

Reinhardt K, MJ Germino, LM Kueppers, J Mitton, C Castanha. 2012. Why Seedlings Die: Linking Carbon and Water Limitations to Mechanisms of Mortality During Establishment in Conifer Seedlings. AGU, General Meeting. San Francisco, CA.

Kueppers LM, C Castanha, AB Moyes, MJ Germino, and MS Torn. 2012. Alpine Treeline Warming Experiment: Effects of Microclimate on Subalpine Seedling Establishment within and Beyond Two Species' Current Elevation Ranges. MtnClim 2012, Estes Park, CO.

Taş N, C Castanha, K Reichl, M Fischer, EL Brodie, MS Torn, JK Jansson. 2012. Carbon Biosequestration Potential and Microbial Stimulation by Pyrolyzed Carbon (Biochar) in Soil. ISME14.

Castanha C, AB Moyes, MS Torn, MJ Germino, LM Kueppers. 2011. Responses of subalpine conifer seedling germination and survival to soil microclimate in the Alpine Treeline Warming Experiment. AGU, General Meeting. San Francisco, CA.

Kueppers LM, AB Moyes, SM Ferrenberg, DS Christianson, C Castanha, MJ Germino. 2011. Manipulation of subalpine and alpine climate in the Alpine Treeline Warming Experiment. AGU, General Meeting. San Francisco, CA.

Reinhardt K, C Castanha, MJ Germino, LM Kueppers. 2011. Leapfrogging of tree species provenances? Interaction of microclimate and genetics on upward tree shifts in tree species range limits. AGU, General Meeting. San Francisco, CA.

Billesbach DP, ML Fischer, DR Cook, MS Torn, C Castanha. 2011. Establishment of a new, cooperative ARM and AmeriFlux site on the Alaskan North Slope. AGU, General Meeting. San Francisco, CA.

Kueppers, LM., C Castanha, AB Moyes, S Ferrenberg, MS Torn, MJ Germino. 2011. Alpine Treeline Warming Experiment: An Experimental Test of Climatic Constraints to Subalpine Tree Species' Recruitment Ranges. Interface 1st INTERFACE meeting: How Do We Improve Earth System Models? Integrating Earth System Models, Ecosystem Models, Experiments and Long-Term Data, Captiva Island, FL.

Castanha C, MJ Germino, MS Torn, SM Ferrenberg, J Harte, LM Kueppers. 2010. Subalpine conifer seedling demographics: Species responses to climate manipulations across an elevational gradient at Niwot Ridge, Colorado. AGU, General Meeting. San Francisco, CA.

Moyes AB, C Castanha, S Ferrenberg, MJ Germino, LM Kueppers. 2010. Sensitivity of limber pine (*Pinus flexilis*) seedling physiology to elevation, warming, and water availability across a timberline ecotone. AGU, General Meeting. San Francisco, CA.

Reinhardt K, C Castanha, MJ Germino, LM Kueppers. 2010. Provenance-level variation in mobile carbon pools corresponds to variation in ecophysiology, growth, and survival in *Pinus flexilis* seedlings from forest to alpine. ESA, Annual Meeting.

Castanha C, B Weibel, MS Torn, MJ Germino, LM Kueppers. 2009. Subalpine conifer seedling demographics across an elevational gradient at Niwot Ridge, Colorado: Comparison of site, species, and provenance. AGU, General Meeting. San Francisco, CA.

Kueppers LM, A Faist, C Castanha. 2009. Population and species differences in treeline tree species germination in response to climate change. AGU, General Meeting. San Francisco, CA.

St.Clair SB, SM Bernard, C Castanha, EA Sudderth, MS Torn, MK Firestone, DD Ackerly. 2007. The influence of cumulative and temporal variation in soil moisture on California grassland plant processes. ESA, Annual Meeting.

Torn MS, SM Bernard, SB St.Clair, ML Fischer, FM Hopkins, SA Placella, C Castanha, EA Sudderth, DJ Herman, R Salve, DD Ackerly, MK Firestone. 2007. Linking the response of annual grasslands to warming and altered rainfall across scales of gene expression, species, and ecosystem. AGU, General Meeting. San Francisco, CA.

Torn MS, SB St.Clair, DD Ackerly, GL Andersen, SM Bernard, EL Brodie, C Castanha, MK Firestone, ML Fischer, DJ Herman, FM Hopkins, SA Placella, R Salve. 2007. Annual grassland response to altered precipitation and temperature: Genes, species, and ecosystem. ESA, Annual Meeting.

Castanha C, AB Smith, S Carey. 2007. Soil properties influence plant species abundance and diversity in a California serpentine grassland. ESA, Annual Meeting.

Castanha C, SE Trumbore, RG Amundson. 2004. The integrated effects of climate and parent material on soil C cycling in California. ESA, Annual Meeting.

Castanha C, RG Amundson. 2002. The role of mineralogy on the turnover time of organic carbon in a volcanic soil in the southern Cascades, California. AGU, General Meeting. San Francisco, CA.

ADVISEES AND INTERNS

Helen Dole, DOE ATCS, 2009

Bettina Weibel, University of Zurich, MS 2010

Fabian Zust, University of Zurich, BS 2010

Evan Portier, SULI, 2013

Richard Thomas, SULI, 2014