Lucas C. R. Silva

College of Arts & Sciences
Soil-Plant-Atmosphere Research Laboratory
University of Oregon, Eugene, OR 97403

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SUMMARY: My teaching and research programs focus on the soil-plant-atmosphere system as a way to understand human-environment interactions. My students are taught biophysical, biogeochemical, and ecological principles as well as the application of these principles to solve problems facing the global community. I study how natural and human-engineered ecosystems response to, and exert influence on, the global environment. My current projects fuse theory, experimentation, and modeling to enhance climate adaptation and mitigation from the tropics to the arctic.

EDUCATION

PhD	2007-2011	Environmental Biology	University of Guelph, Canada
MS	2005-2007	Ecosystem Ecology	University of Brasília / University of Miami, USA
BS	2001-2005	Forestry	University of Brasília, Brazil

PROFESSIONAL EXPERIENCE

Associate Professor (with tenure)	2020-	University of Oregon, USA
Assistant Professor	2016-2020	University of Oregon, USA
Research Faculty & Lecturer	2013-2016	University of California, Davis, USA
Postdoctoral Fellow	2011-2013	University of California, Davis, USA
Research Staff	2001-2005	EMBRAPA, Brasilia, Brazil

PUBLICATIONS

Full list including: 1 book chapter; 2 technical report; >90 peer-reviewed articles (Google Scholar: >3000 citations; H-index 29; i10-index 60); * *indicates corresponding authorship*

95- **SILVA L.C.R.***, CORREA R., WRIGHT J, BOMFIM B, GAVIN D, et al. (In Press) A New Hypothesis for the Origin of Amazonian Dark Earths. ***Nature Communications***

94- WRIGHT J, BOMFIM B, ET AL, **SILVA L.C.R.*** (In Press) Sixteen Thousand Years of Increasing Tree Growth Prior to Recent Deforestation in the Amazon-Cerrado Transition. ***Global Change Biology***

93- QUADRI P, ZAVALETA E, **SILVA L.C.R.** (Tentatively Accepted Pending Revisions). Climate-induced reversal of tree growth patterns in a high-elevation tropical forest. ***Science Advances***

92- MAXWELL T & **SILVA LCR*** (2020) A State Factor Model of Carbon-Water Relations. ***CELL Press Trends in Plant Sciences*** *https://doi.org/10.1016/j.tplants.2020.02.007*

91- CORREA-DIAZ A, **SILVA LCR** et al. (2020) From trees to ecosystems: Spatiotemporal scaling of climatic impacts on montane landscapes using dendrochronological, isotopic and remotely-sensed data ***Global Biogeochemical Cycles*** *https://doi.org/10.1029/2019GB006325*

90- **SILVA LCR*** & LAMBERS H (2020) Soil-plant-atmosphere interactions: structure, function, and predictive scaling for climate change mitigation. ***Marschner Review*** *https://link.springer.com/article/10.1007/s11104-020-04427-1*

89- BOMFIM B, **SILVA LCR*** et al. (2020) Fire affects asymbiotic nitrogen fixation in southern Amazon forests. ***J of Geophysical Research Biogeosciences*** *https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2019JG005383*

88- BOMFIM B, **SILVA LCR**, PEREIRA R, GATTO A, EMMERT F, HIGUCHI N (2020) Litter and soil biogeochemical parameters as indicators of sustainable logging in Central Amazonia. ***Science of the Total Environment*** *https://doi.org/10.1016/j.scitotenv.2020.136780*

87- **SILVA LCR***, WOOD M, et al. (2020) Landscape Carbon Sequestration for Atmospheric Recovery: A Perspective on Convergence to Accelerate Carbon Sequestration. National Science Foundation (NSF) White Paper. *https://law.uoregon.edu/sites/law1.uoregon.edu/files/white_paper_lcsar.pdf*

Promoted to Associate Prof

86- MOTTA A, CORRÊA R, MELO V, MUNIZ A, **SILVA LCR**, et al. (2020) Elemental signatures of an Amazonian

Dark Earth as result of its formation process. ***Geoderma*** 361(1) 114085

85- CASTRUITA-ESPARZA L, **SILVA LCR** et al. (2019) Coping with extreme events: growth and water-use efficiency of dominant trees during the driest and wettest periods of the past 160 years ***J of Geophysical Research Biogeosciences*** 124(11) 3419-3431

84- DOANE TA, **SILVA LCR**, HORWATH W (2019) Exposure to light elicits a spectrum of chemical changes in soil ***J of Geophysical Research Earth Surface*** 124(8) 2288-2310

83- LILES GC, MAXWELL T, **SILVA LCR***, et al. (2019) Two Decades of Experimental Manipulation Reveal Potential for Enhanced Biomass Accumulation and Water Use Efficiency in Ponderosa Pine Plantations Across Climate Gradients. ***J Geophysical Research Biogeoscience*** 124(7) 2321-2334

82- WARD B, WONG CI, NOVELLO VF, MCGEED D, SANTOS RV, **SILVA LCR**, et al. (2019) Reconstruction of Holocene coupling between the South American Monsoon System and local moisture variability from speleothem δ18O and 87Sr/86Sr records. ***Quaternary Science Reviews*** 210(15) 51-63

81- JERSZURKI D, SOUZA J, **SILVA LCR** (2019) Sensitivity of ASCE-Penman-Monteith Reference Evapotranspiration under Different Climate Types in Brazil. ***Climate Dynamics*** 53(1) pp 943–956

80- CORREA-DÍAZ A, **SILVA LCR**, et al. (2019) Linking remote sensing and dendrochronology to quantify climate-induced shifts in high-elevation forests over space and time ***J of Geophysical Research Biogeosciences*** 124(1) 166-183

79- GIGUÈRE-CROTEAUA, É BOUCHER, Y BERGERON, **SILVA LCR**, et al. (2019) North America's oldest boreal trees show an unprecedented increase in water-use efficiency, but not growth. ***Proceedings of the National Academy of Science*** 116 (7) 2749-2754

78- LIANG Y, KRAUS T; DOANE TA; **SILVA LCR**, et al. (2019) Effects of ferric sulfate and polyaluminum chloride coagulation enhanced treatment wetlands on Typha growth, soil and water chemistry. ***Science of the Total Environment*** 648, 116-124.

77- BOMFIM B, **SILVA LCR***, DOANE T, HORWATH W (2019) Interactive effects of land-use change and topography on asymbiotic nitrogen fixation in the Brazilian Atlantic Forest. (issue cover) ***Biogeochemistry*** 142(1) 137–153.

76- MAXWELL T, **SILVA LCR***, HORWATH W (2018) Predictable oxygen isotope exchange between plant lipids and environmental water: implications for ecosystem water balance reconstruction. ***J of Geophysical Research Biogeosciences*** 123 ,2941–2954.

75- DUARTE-GUARDIA S, PERI PL, AMELUNG W, SHEIL D, LAFFAN SW, BORCHARD N, **SILVA LCR** et al (2018) Better estimates of soil carbon from geographical data: a revised global approach. ***Mitigation Adaptation Strategies Global Change*** 24(3) 355–372.

74- MAXWELL T, **SILVA LCR***, HORWATH W (2018) Integrating effects of species composition and soil properties to predict shifts in montane forest carbon-water relations. ***Proceedings of the National Academy of Science***. 115 (18) E4219-E4226.

73- CORREA-DÍAZ A, **SILVA LCR,** GÓMEZ-GUERRERO A, DÍAZ JV, ET AL (2018) Physiological response of *"Taxodium mucronatum"* Ten. To the increases of atmospheric CO_2 and temperature in the last century. ***Agrociencia*** 52(1) 129-149.

72- **SILVA LCR*** & LAMBERS H (2018) Soil-plant-atmosphere interactions: ecological and biogeographical considerations for climate-change research. Book chapter. 29-60. In: **Climate Change Impacts on Soil Processes & Ecosystem Properties** 625p. *https://www.sciencedirect.com/science/article/pii/B9780444638656000028*

71- JERSZURKI D, COUVREUR V, MAXWELL T, **SILVA LCR**, MATSUMOTO N, SHACKEL N, SOUZA JLM, HOPMANS J (2017) Impact of root growth and hydraulic conductance on canopy carbon-water relations of young walnut trees (*Juglans regia* L.) under drought. ***Scientia Horticulturae*** 226, 342-352

70- SPERLING O, **SILVA LCR***, TIXIER A, THÉROUX-RANCOURT G, ZWIENIECKI M (2017) Temperature gradients assist carbohydrate allocation within trees ***Nature Scientific Reports*** 7, 3265.

69- JERSZURKI D, SOUZA JLM, **SILVA LCR** (2017) Expanding the geography of evapotranspiration: An improved method to quantify land-to-air water fluxes in tropical and subtropical regions. ***PLOS One*** 12(6) e0180055.

68- DEVEREL S, OIKAWA P, DORE S, MACK S, **SILVA LCR** (2017) Restoration of California deltaic and coastal wetlands: A tool for climate change mitigation. Co-authored book. ***American Carbon Registry****, 186 pp.*

67- **SILVA LCR*** (2017) Carbon sequestration beyond tree longevity. ***Science*** 355 (6330), 1141

66- MORRIS J, YE R, **SILVA LCR**, HORWATH WR (2017) Nitrogen fertilization had no effect on CH4 and N2O emissions or productivity in rice planted in rewetted peat lands. ***Soil Science Society of America Journal***. 81, 224–232.

65- WORTHAM BE, WONG CI, **SILVA LCR**, MCGEE D, RASBURY ET, MONTAÑEZ IP (2017) Assessing response of local moisture conditions in central Brazil to variability in regional monsoon intensity using speleothem 87Sr/86Sr values. ***Earth and Planetary Science Letters*** 463, 310-322.

64- DIETRICH R, BELL FW, **SILVA LCR**, CECILE A, HORWARTH WR, ANAND M (2017) Climatic sensitivity, water-use efficiency and growth decline in boreal jack pine (*Pinus banksiana*) forests in Northern Ontario. ***JGR Biogeosciences*** 121 2761–2774.

63- WINSOME T, **SILVA LCR***, SCOW KM, DOANE TA, HORWATH WR (2017) Plant-microbe interactions regulate carbon and nitrogen accumulation in forest soils. ***Forest Ecology & Management*** 15 415-423.

62- **SILVA LCR***, SUN G., et al. (2016) Tree growth acceleration and expansion of alpine forests: The synergistic effects of atmospheric and edaphic change. ***Science Advances*** 2(8) e1501302.

Joined UO as Assist Prof

61- FARIAS J., MARIMON B., **SILVA LCR***, et al. (2016) Survival and growth of native *Tachigali vulgaris* and exotic *Eucalyptus urophilla* × *E. grandis* trees in degraded soils with biochar amendment in southern Amazonia. ***Forest Ecology & Management*** doi:10.1016/j.foreco.2016.03.022

60- SHEIL D, LADD B, **SILVA LCR**, LAFFAN SW, VAN HEIST M (2016). How are soil carbon and tropical biodiversity related? ***Environmental Conservation***. DOI: 10.1017/S0376892916000011

59- EARLES J, SPERLING O, MCELRONE A, **SILVA LCR**, et al. (2016) Bark water uptake promotes localized hydraulic recovery in coastal redwood crown. ***Plant, Cell & Environment*** DOI: 10.1111/pce.12612

58- **SILVA LCR***, SALAMANCA-JIMENEZ A, DOANE TA, HORWATH WR (2015) Carbon dioxide level and form of soil N regulate assimilation of atmospheric ammonia in trees. ***Nature Scientific Reports*** 5:13141

57- BUELOW M, STEENWERTH K, **SILVA LCR**, PARIKH S (2015) Characterization of Winery Wastewater for Reuse in California (award winning paper) ***American Journal of Enology and Viticulture*** 66: 302-310.

56- **SILVA LCR*** (2015) From air to land: Understanding water resources through plant-based multidisciplinary research. ***Trends in Plant Sciences*** 20(7) 399–401

55- **SILVA LCR*,** GOMEZ-GUERRERO A, DOANE TA, HORWATH, W (2015) Isotopic and nutritional evidence for species- and site-specific responses to N deposition and elevated CO_2 in temperate forests. ***Journal of Geophysical Research Biogeosciences*** 120(6) 1110–1123

54- **SILVA LCR***, PEDROSO G, DOANE T, HORWATH (2015) Beyond cellulose: Oxygen isotope composition of plant lipids as a proxy for terrestrial water balance ***Geochemical Perspective Letters*** 1 33-42

53- PAIVA AO, **SILVA LCR***, HARIDASAN M (2015) Productivity-efficiency tradeoffs in tropical forest-savanna transitions: linking plant-soil processes through litter input and composition. ***Plant Ecology*** 216, 775-787

52- **SILVA LCR***, DOANE TA, et al. (2015) Iron-mediated stabilization of soil carbon amplifies the benefits of ecological restoration in degraded lands. ***Ecological Applications*** 25(5), 2015, pp. 1226–1234

51-WANG Z, **SILVA LCR**, SUN G, LUO P, MOU C, HORWATH WR (2015) Quantifying the impact of drought on soil-plant interactions: A seasonal analysis of biotic and abiotic controls of carbon and nutrient dynamics in high-altitudinal grasslands. ***Plant & Soil*** 389, 59-71

50-**SILVA LCR*** (2014) Seasonal variation in groundwater depth does not explain structure and diversity of tropical savannas. ***Journal of Vegetation Science.*** 26(2), 404–406

49-MAXWELL T, **SILVA LCR***, HORWATH W (2014) Using multi-element isotopic analysis to decipher drought impacts and adaptive management in ancient agricultural systems. ***Proceedings of the National Academy of Sciences*** 111(45): E4807–E4808

48-**SILVA LCR*** (2014) The importance of climate-driven forest-savanna biome shifts in anthropological and ecological research. ***Proceedings of the National Academy of Sciences*** 111 (37) E3831-E3832

47-SHI C, **SILVA LCR**, ZHANG H, ZHENG Q, XIAO B, WU N, SUN G (2014) Climate warming alters nitrogen dynamics and total non-structural carbohydrate accumulations of perennial herbs of distinctive functional groups during the plant senescence in an alpine meadow of the Tibetan Plateau, China. ***Agricultural and Forest Meteorology*** 200: 21-29

46-**SILVA LCR*** (2014) Natural history and evolution of the Kwongan – a global biodiversity hotspot. Invited Book Review. ***Trends in Plant Sciences*** 19: p686

45-LADD B, PERI PL, PEPPER DA, **SILVA LCR**, SHEIL D, et al. (2014) Carbon isotopic signatures of soil organic matter correlates with leaf area index across woody biomes. ***Journal of Ecology*** 102: 1606–1611

44-QIAO Y, MIAO S, **SILVA LCR***, HORWATH WR (2014) Understory species regulate litter decomposition and accumulation of C and N in forest soils: A long-term dual-isotope experiment. ***Forest Ecology & Management*** 12(2): 873-878

43-FRANCO AC, ROSSATTO DR, **SILVA LCR**, FERREIRA CS (2014) Cerrado vegetation and global change: The role of functional types, resource availability and disturbance in regulating plant community responses to rising CO_2 levels and climate warming. ***Theoretical and Experimental Plant Physiology*** 26 (1): 19-38

42-ROSSATTO DR, **SILVA LCR**, STERNBERG LSL, FRANCO AC (2014) Do woody and herbaceous species compete for soil water across topographic gradients? Evidence for niche partitioning in a Neotropical Savanna. ***South African Journal of Botany*** 91(4): 14-18

41-QIAO Y, HAN X, **SILVA LCR**, MIAO S (2014) Changes in soil respiration due to long-term application of organic and mineral fertilizers. ***Journal of Food, Agriculture & Environment*** 12 (2): 873-878

40-MUKOME FND, DOANE TA, **SILVA LCR**, HORWATH WR, PARIKH SJ (2013) Testing protocol ensures the authenticity of organic fertilizers. ***California Agriculture*** 67(4): 210-216.

39-**SILVA LC.R***, ANAND M (2013) Historical links and new frontiers in the study of forest-atmosphere interactions. ***Community Ecology*** 14(2): 208-218.

38-ANAND M, LEITHEAD M, **SILVA LCR**, WAGNER C, et al. (2013) The Scientific Value of the Largest Remaining Old-Growth Red Pine Forests in North America. ***Biodiversity and Conservation.*** 22: 1847–1861.

37-BORGHETTI F, LIMA EC, **SILVA LCR** (2013) A simple procedure for the purification of active fractions in aqueous extracts of plants with allelopathic properties. ***Acta Botanica Brasilica*** 27(1): 50-53.

36-ZHU X, **SILVA LCR**, DOANE TA, WU N, HORWATH WR (2013) Quantifying the effects of compost application, water content, and nitrogen fertilization on N_2O emissions in ten agricultural soils. ***Journal of Environmental Quality*** 42(3): 912-918.

35-HAIDAR RF, PINTO RR, DIAS RR, VALE GD, **SILVA LCR**, FAGG C (2013) Seasonal forests and ecotones (seasonal/ombrophilous forest) in the state of Tocantins, Brazil: structure, classification and guidelines for conservation. ***Acta Amazonica*** 43(3): 261-290.

34-**SILVA LCR***, HOFFMANN WA, ROSSATTO DR, et al. (2013) Can savannas become forests? A coupled analysis of disturbance thresholds and nutrient stocks in central Brazil. ***Plant & Soil*** 373(1-2) 829-842.

33-ZHU X, **SILVA LCR**, DOANE TA, HORWATH WR (2013) Iron: The forgotten driver of N_2O emissions from soils. ***PLoS One*** 8(3): e60146.

32-MUKOME FND, ZHANG X, **SILVA LCR**, SIX J, PARIKH SJ (2013) Use of chemical and physical characteristics to investigate trends in biochar feedstocks. ***Journal of Agricultural and Food Chemistry.*** 61: 2196-2204.

31-ROSSATTO DR, HOFFMANN WA, **SILVA LCR**, HARIDASAN M, STERNBERG LSL, FRANCO AC (2013) Seasonal variation in leaf traits between congeneric savanna and forest trees in Central Brazil: implications for forest expansion into savanna. ***Trees.*** 27: 1139-1150.

30-CECILE J, **SILVA LCR**, ANAND M (2013) The decline of trees across biomes. ***Science.*** 339: 904-905.

29-**SILVA LCR***, CORRÊA RS, et al. (2013) Unprecedented carbon accumulation in mined soils: the synergistic effect of resource input and plant species invasion. ***Ecological Applications.*** 23: 1345–1356

28-GÓMEZ-GUERRERO A, **SILVA LCR***, et al. (2013) Growth decline and divergent tree-ring isotopic composition ($\delta^{13}C$ and $\delta^{18}O$) contradict predictions of CO_2 stimulation in high altitudinal forests. (issue cover) ***Global Change Biology***. 19: 1748–1758

27-**SILVA LCR***, HORWATH WR (2013) Explaining global changes in water use efficiency: Why have we overestimated forest responses to rising atmospheric CO_2? **PLoS One** 8(1): e53089

26-**SILVA LCR***, ANAND M (2013) Probing for the influence of atmospheric CO_2 and climate change on forest ecosystems across biomes. (award winning paper) ***Global Ecology and Biogeography***. 22: 83–92

25-LADD B, LAFFAN S, AMELUNG W, PERI P, SHEIL D, **SILVA LCR**, GERVASSI P, BONSER S, NAVELL M (2013) Estimating soil carbon in temperate and tropical forest and woodland ecosystems from existing GIS data on three continents. ***Global Ecology and Biogeography*** 22: 461–469

Joined UCD Research Faculty (Professional Research Series)

24-HOFFMANN WA, GEIGER EG, GOTSCH SG, ROSSATTO DR, **SILVA LCR**, LAU OL, HARIDASAN M, FRANCO AC (2012) Ecological thresholds at the savanna-forest boundary: How plant traits, resources and fire govern the distribution of tropical biomes. ***Ecology Letters*** 15: 759–768.

23-LEITHEAD M, **SILVA LCR**, ANAND M (2012) Recruitment patterns and northward tree migration through canopy gap dynamics in an old-growth white pine forest in northern Ontario. ***Plant Ecology*** 213: 1699-1714.

22-ROSSATTO DR, **SILVA LCR**, FRANCO AC, STERNBERG LSL (2012) Depth of water uptake during the wet season is correlated with vegetation structure along a topographic gradient in a Central Brazilian Savanna. ***Environmental and Experimental Botany*** 77: 259-266

21-QIAO Y, **SILVA LCR**, HAN X, MIAO S, YAN C, HORWATH WR (2012) Fate of photosynthetically-fixed carbon in soybean crops measured using 13C labeling after long-term fertilization of Phaeozem soils in Northeast China. ***Zemdirbyste agriculture*** 99: 419–424

20-**SILVA LCR***, ANAND M (2011) Mechanisms of Araucaria (Atlantic) forest expansion into southern Brazilian grasslands. ***Ecosystems*** 14: 1354-1371

19-**SILVA LCR***, GIORGIS M, ANAND M, ENRICO L, PÉREZ-HARGUINDEGUY N, FALCZUK V, TIESZEN LL, CABIDO M (2011) Evidence of shift in C_4 species range in central Argentina during the Late Holocene. ***Plant & Soil*** 349: 261-279

18-LINDOSO GS, **SILVA LCR**, FELFILI JM (2011) Environmental variations and floristic relationship in cerrado sensu stricto on Entisols at Sete Cidades National Park, Piauí ***Revista de Biologia Neotropical*** 8(2): 1-12

Joined UCD as Postdoctoral Fellow

17-**SILVA LCR***, STERNBERG L da SL, HAIDAR RF, VALE GD (2010) Deciphering earth mound origins in central Brazil. (issue cover) ***Plant & Soil*** 336: 3–14

16-**SILVA LCR***, ANAND M, LEITHEAD M (2010) Recent widespread tree growth decline despite increasing atmospheric CO_2. (journal highlight) ***PLoS One*** 5(7): e11543.

15-**SILVA LCR***, HARIDASAN M, STERNBERG LSL, FRANCO AC, HOFFMANN WA (2010) Not all forests are expanding into central Brazilian savannas. ***Plant & Soil*** 333: 431-443.

14-**SILVA LCR**, CORRÊA RS (2010) Evolution of substrate quality of a mined area in the Brazilian Savanna after revegetation with Stylosanthes spp. ***Revista Brasileira de Engenharia Agrícola e Ambiental*** 14(8): 835-841.

13-CORRÊA RS, **SILVA LCR**, Baptista GMM, Santos PF (2010) Chemical fertility of substrate treated with domestic sewage sludge and municipal composted waste. ***Revista Brasileira de Engenharia Agrícola e Ambiental*** 14(5): 538–544

12-LEITHEAD M, ANAND M, **SILVA LCR** (2010) Northward migrating tree species establish in large, old treefall gaps in the temperate – boreal forest ecotone of northern Ontario, Canada. ***Oecologia*** 164(4): 1095-1106

11-ROSSATTO DR, TAKAHASHI FSC, **SILVA LCR,** FRANCO AC (2010) Functional traits of shade and sun leaves in 10 gallery forest tree species, Federal District, Brazil. ***Acta Botanica Brasilica*** 24(3): 640-647

10-**SILVA LCR***, ANAND M, OLIVEIRA JM, PILLAR VD (2009) Past century changes in *Araucaria angustifolia* (Bertol.) Kuntze water use efficiency and growth in forest and grassland ecosystems of southern Brazil: implications for forest expansion. ***Global Change Biology*** 15: 2387–2396

9-**SILVA LCR**, STERNBERG L, HARIDASAN M, HOFFMANN WA, et al. (2008) Expansion of gallery forests into central Brazilian savannas. ***Global Change Biology*** 14(9): 2108–2118

8-**SILVA LCR** & CORRÊA RS (2008) Survival and growth of six tree species under four treatments on a mined area

in the Brazilian savanna. ***Revista Árvore*** 32: 731-740

7-CORRÊA RS, BAPTISTA GMM, BALDUINO APC, **SILVA LCR** (2008) Agronomic efficiency of two organic residues on the revegetation of a red Oxisol C-horizon. ***Revista Ciência Agronômica*** 39: 503-510

6-FARIA PJ, ALMEIDA F, **SILVA LCR**, VIEIRA RF, AGOSTINI-COSTA TS (2008) Chemical characterization of pulp of *Butia capitata* var capitata. ***Revista Brasileira de Fruticultura*** 30, 3, 820-822

5-FARIA PJ, ARELLANO DB, GRIMALDI R, **SILVA LCR**, VIEIRA RF, et al. (2008) Chemical characterization of nut of *Butia capitata* var capitata. ***Revista Brasileira de Fruticultura*** 30: 1-4

Joined UoG as PhD student

4-RESENDE AV, MACHADO CTT, **SILVA LCR**, LINHARES NW et al. (2006) Rocks as a source of potassium and other nutrients in annual crops. ***Espaço e Geografia*** 9: 135-161

3-RESENDE AV, MACHADO CTT, MARTINS ES, **SILVA LCR** et al. (2006) Rocks as a source of potassium in corn crops in Brazilian savannas (Cerrado). ***Boletim de Pesquisa e Desenvolvimento*** 162: 1-20

2-BORGHETTI F, **SILVA LCR**, et al. (2005) Aqueous leaf extract properties of Cerrado species in Central Brazil. ***Proceedings of the World Congress on Allelopathy*** Wagga Wagga, Australia: 388-390

1-PINHEIRO CQ, **SILVA LCR**, CORREA RS (2005) Survival and growth of trees treated with sewage sludge, compost or cattle manure in mined spoils in the Brazilian Cerrado. ***Sociedade & Natureza*** 5: 789-795

RESEARCH GRANTS

a) Current

USDA Natural Resources and Environment (BRNE) program. | Recommended for funding 2020 /2023| **Role:** Co-P.I. **Title:** Ecological intensification for a productive oak-hazelnut savannah landscape. **Total:** $ 500,000

NSF Long-Term Ecological Research | Recommended for funding 2020 / 2026| **Role:** Co-P.I. **Title:** H.J. Andrews Experimental Forest (LTER8) **Total:** $7,000,000

NSF Convergence Accelerator 1939511 | Duration: 10/01/19 – 07/30/21 | **Role:** P.I. **Title:** Landscape Carbon Sequestration for Atmospheric Recovery (LCSAR) **Total:** $ 80,610

NSF Plant Biotic Interactions (PBI) 1758947 | Duration: 07/01/18 – 07/30/20 | **Role:** PI **Title:** Harnessing biological complexity to improve food security: How do mycorrhizal networks control resource transfer and plant productivity in inter- and mono-crop model systems? **Total:** $299,705 **Published articles** #72. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1758947

Resilience Initiative Interdisciplinary Research | Duration: 08/01/19 – 03/30/21 **Role:** P.I. **Title:** Interdisciplinary Science for Environmental and Social Security **Total:** $50,000

b) Completed

NSF Atmospheric and Geospace Sciences (AGS) 1602958 | Duration: 08/01/16 – 03/30/20 **Role:** P.I. **Title:** Collaborative Research: Delineating Holocene climate-biosphere links from climate and vegetation reconstructions from the Amazon region **Total:** $476,217. **Published articles** #65, 69, 77, 78, 81. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1602958

National Geographic Society | Duration: 07/01/18 – 07/30/19 | **Role:** Co-PI **Title:** The climate paradox: mapping resilience and vulnerability of montane forests **Published articles** #80.

NIFA | Duration: 07/01/14 – 07/30/18 |Grant #: 2014-67003-22077 |**Role:** Co-PI **Title:** *Agricultural sensitivity to climate change and water resources interactions in the San Joaquin Valley California and system resilience offered by adaptation strategies* **Total:** $1,874,997 **Published articles** #44, 49, 56, 66, 74, 77, 79, 81. https://app.dimensions.ai/details/grant/grant.3942599

Save-the-Redwoods League FY14 | Duration: 07/01/16 – 07/30/18 |Grant #: 089 | **Role:** Co-PI **Title:** *Understanding the influence of an apex predator on the forest carbon cycle: mapping trophic pathways and identifying microbial players with stable isotope and community DNA* **Total:** $25,000 **Published articles** #59, 67.

California Department of Food and Agriculture | Duration: 10/01/14 – 04/30/17 |Grant #: 26491 |**Role:** P.I. **Title:**

Measuring evapotranspiration, water balance and depth of water uptake to improve efficiency of California's tree crops **Total:** $370,359 **Published articles** #66, 69, 70, 71, 74, 77, 80.

University of California Academic Federation Innovative Development Award (2015-2017) |**Role:** PI **Title:** Retracing drought impacts in California: A new approach to measure changes in food quality and productivity as caused by fluctuations in rainfall **Total:** $12,924 **Published articles** #54, 58, 64.

UC MEXUS-CONACYT (Awarded 2014-2016). CN 13-546 |**Role:** Co-PI P.I. **Title:** Effects of soil-plant feedbacks on the response of forest ecosystems to climate variability and nitrogen deposition **Total:** $25,000. Published articles #28, 55, 73, 75, 76.

Chinese Academy of Science, Grant for International Researchers (Awarded 2012-2014) **Role:** PI. Sept 2012-14. **Title:** Climate-driven vegetation and soil nutrient dynamics across altitudinal gradients in the Qinghai-Tibetan Plateau, China. Chengdu Institute of Biology $50,000. **Published articles** #47, 51, 62.

National Council for Scientific and Technological Development Brazil (2014-2016). **Role:** Co-PI. Ecological implications of large scale restoration of degraded land in the Cerrado-Amazon transition $100,000. **Published articles** #52, 53, 60, 71, 78.

USAID / UC RIFA (Research and Innovation Fellowships) | Duration: 01/07/16 – 07/30/18 | **Role:** Collaborator **Title:** *Investigating links between plant diversity and soil properties to promote sustainable agriculture in tropical regions*. **Total:** $122,089 **Published articles** #60, 61, 71, 73, 78.

AWARDS

- Sustainability Research Award – University of Oregon 2019
- National Academy of Sciences – Macrosystems Biology / NEON Travel Award 2019
- Early Career Excellence in Research – University of Oregon 2018
- Best paper of the year – American Society for Enology & Viticulture 2016
- National Academy of Sciences – Coupled Human & Nat Systems Travel Award 2016
- Innovative Research Development Award – UC Davis Academic Federation 2015
- J Stan Rowe Award for best paper in Ecology – Canadian Botanical Association 2013
- Canadian Society for Ecology and Evolution – Travel Award 2010
- Ontario Agricultural College Graduate Award – U Guelph 2009
- Arthur D. Latornell Graduate Scholarship – U Guelph 2008
- National Academy of Sciences Biocomplexity Graduate Fellowship – U Miami 2006/2007

MEDIA HIGHLIGHTS

- Sustainability Research Video
- Jefferson Public Radio Interview
- Early Career Excellence in Research Award
- Solving interdisciplinary puzzles at the SPA Lab
- Climate change impact on forest carbon and water
- Looking at climate stress on West Coast rangelands
- Restoration of California Deltaic and Coastal Wetlands
- UO researcher finds surprise growth in Tibetan forest
- Soil carbon – key to protecting biodiversity and climate
- Winery wastewater a viable water source for vineyards
- Plants use nitrogen from the atmosphere in unexpected ways

SERVICE

a) University

Resilience Initiative (2018/2019): One of 10 faculty members developing a strategic plan for interdisciplinary research focused on improving human well-being and environmental stability under climate change. For example, a recently awarded grant titled "Landscape Carbon Sequestration for Atmospheric Recovery (LCSAR)" (Silva PI) involves faculty and graduate students in Biology, Landscape Architecture, and Law School as well as partnerships in California, Oregon, and Washington. The project is designed to accelerate CO_2 drawdown through natural climate solutions in alignment with industry and land stewardship needs. It brings together (i) academic experts, (ii) industry

stakeholders (iii) federal, tribal, and local managers, (iv) land trusts and private owners, and (v) technology companies developing open access infrastructure to envision transformative partnerships. Expected outcomes include data-integration platforms that catalyze investments toward carbon sequestration to foment the use of landscape-based research into an actionable set of protocols and deliverables.

Data Science Initiative (2018/2019): Faculty search committees related to Data Science (e.g. Data Science / Ecology in IE2 2018/2019; Remote Sensing and Data Science for Social Equity in GEO 2018/2019).

Search committees for UO's new Strategic Research Initiatives Department Head and Research Development Services (Kate Petcosky; 2017/2018);

Service in the form of training, data gathering, and technical expertise. For example, workshops for ~40 students who are not part of SPA Lab's core group (2016/2017/2018) including instrumentation and supplies for analysis of plants, soils, and artifacts in collaboration with Anthropology, Earth Sciences, and Biology faculty;

b) Department

ENVS	Interim Director of Graduate Studies (Spring/Summer 2017) Commencement speaker as Director of Graduate Studies (Summer 2017) Graduate student recruiting committees (Fall/Winter 2016/17 and 2018/19) Chair of Events and Seminar Committee (Fall/Winter 2017/18) Liaison Geography/Environmental Studies Graduate student qualifying/thesis committees (Paul Reed, Alejandro Brambila)
GEO	Data Science for Social Equity faculty search committee (Fall/Winter 2017/18) Graduate student committees (Kate Hayes, Lauren Hendrix, Chantel Saban, Mohhamad Eshghi) Seminar Tea Talk Speaker Library representative
IE2	Microbial Ecology faculty search committee (Fall/Winter 2016/17) Data Science Ecology faculty search committee (Fall/Winter 2018/19) Graduate student qualifying committees (Dan Thomas, Jessica Cothern, Kaye Shek, Kayla Evens) Graduate lab rotation (Andrew Morris, Alejandro Brambila, Ian Petersen, Max Spencer, Monica Ruwaimana) Graduate Recruiting Events

c) Profession

Editorial role

- Plant & Soil. Section Editor (Oct 2014-Present)
  https://www.springer.com/life+sciences/plant+sciences/journal/11104?detailsPage=editorialBoard
- Nature Publishing Group. Environmental Sciences Editor (Sept 2016 – 2020)
  https://www.nature.com/srep/about/editorial-board
- PLoS ONE. Ecology Academic Editor (July 2014-2020)
  http://journals.plos.org/plosone/static/editorial-board
- Soil Science Society of America. Communications editor (Mar 2014 – Aug 2017)
  https://www.soils.org/about-society/committees/s302/members/

Research grant selection panels - California Department of Fish and Wildlife; National Science Foundation: Division of Environmental Biology / Ecosystem studies; National Science Foundation: CONICYT Comisión Nacional de Investigación Científica y Tecnológica (Chile); National Science Center Poland: Division of Plant Biology / Environmental Sciences; Flanders Research Foundation Flanders (Fonds Wetenschappelijk Onderzoek: FWO, Belgium).

Reviewer - Agricultural & Forest Meteorology; Atmosphere; Biogeoscience; Biology Letters; Ecohydrology; Ecology; Ecological Complexity; Ecosystems; Funct Plant Biology; Global Change Biology; Global Ecology & Biogeography; Nature Climate Change; Nature Sci Reports; Oecologia; Palaeogeography, Palaeoclimatology, Palaeoecology; Plant & Soil; Plant Cell & Envir; PLoS ONE; Restoration Ecology; Soil Biology & Biogeochemistry; Soil Science Society of America; Trees.

Memberships – American Association of Geographers; American Geophysical Union; Ecological Society of America; Soil Science Society of America.

d) Outreach

Science training in underserved communities: Organizer and instructor of NSF-funded field ecology and stable isotope courses for undergraduate students in public universities serving underserved communities across the Cerrado-Amazon region in central Brazil (2017-2019). Organizer and instructor of field and lab research projects at UO to provides research opportunities for low-income first-generation SPUR undergraduate students and NSF GRFP training workshops.

Land managers and farmers: Lead PI in California Department of Food and Agriculture grants focusing on sustainability under climatic stress in collaboration with UC cooperative extension specialists to improve wastewater management and drought resilience across California; Lead PI in projects spanning several years of outreach activities funded by the National Science Foundation PBI, USDA NIFA in California, Oregon and Washington states focusing on agricultural sustainability and rangeland resilience in connection with plant-fungal network behavior under drought.

UC MEXUS / USAID / UC RIFA International Research Mentoring: Co-advisor of students investigating links between plant diversity and soil properties to promote sustainable forestry and agriculture in Mexico and Brazil (2015-2017) providing innovation fellowships awards to support graduate student research and professional development.

High School research opportunities: Supervised high school students from underserved communities in California working on tree identification and ecophysiological measurements. An award-winning project at Woodland high-school involved student training in field sampling techniques and lab work at the UC Davis Stable Isotope Facility. Similar activities are planned for pending grant proposals - NSF Career and USDA NIFA grants in collaboration with UO Summer Program for Undergraduate Research in Life Sciences (SPUR) program (pending).

TEACHING AND MENTORING

Courses Taught

University of Oregon

- Soil Science (ENVS 477/577; Fall 2017; Fall 2018; Fall 2019; Fall 2020);
- Soil-Plant-Atmosphere Interactions (GEO 607; Spring 2018; Spring 2020);
- Interdisciplinary Research Develop (ENVS 607; Winter 2016; Winter 2019);
- Forests & Society (GEO 410/510; Spring 2019);

University of California Davis

- Global Carbon Cycle (SSC 222; Winter 2013; 2015);
- Stable Isotope Applications in Ecology (SSC 290; Fall 2015);
- Agricultural and Environmental Chemistry (AGC 290; Fall 2014; Spring 2015);

MENTORING

PhD students	Institution	Advisory role	Year completed	Present Employment
Schyler Reis	UO (ESSP/Geo)	Main advisor	Current	
Adriana Uscanga Castillo	UO (Geo)	Main advisor	Current	
Jamie Wright	UO (ESSP/Bio)	Main advisor	Current	
Oriana Chafe	UO (ESSP)	Main advisor	Current	
Barbara Bomfim	UC Davis	Co-Advisor	2018	Postdoctoral fellow UO
Toby Maxwell	UC Davis	Co-Advisor	2018	Postdoctoral fellow UO
Daniela Jerszurki	UC Davis	Co-Advisor	2016	Postdoctoral fellow U Negev Israel
Josenilton de Farias	UC Davis	Co-Advisor	2016	Assist professor U Mato Grosso Brazil
Julie Bower	UC Davis	Co-Advisor	2015	Postdoctoral fellow UC Davis CA
Alveiro Salamanca-Jimenez	UC Davis	Co-Advisor	2015	Research faculty NCCR Colombia
Mason Earles	UC Davis	Co-Advisor	2015	Assistant Professor UC Davis

MS students	Institution	Advisory role	Year completed	Present Employment
Oriana Chafe	UO (ESSP)	Main advisor	2020	
Weicheng Wang	UO (Geo)	Main advisor	2020	
Mike Farinacci	UO (Geo)	Main advisor	2020	
Laura Emberson	UC Davis	Main advisor	2017	Environmental analyst NRCS DC
Tara Seely	UC Davis	Main advisor	2017	NSF GRFP PhD student UC Berkeley
Jennifer Morris	UC Davis	Co-Advisor	2015	Research scientist / consultant MLJ CA

Undergraduate students	Institution	Project	Advisory role	Year
Aaron LeFore	UO	Honors thesis	Co-supervising with lab postdocs	2018/2019

Hunter Mackin	UO	Env Sci Internship	Co-supervising with lab postdocs	2018/2019
Sydney Katz	UO	Env Sci Internship	Co-supervising with lab postdocs	2018/2019
Elizabeth Baach	UO	Env Sci Internship	Co-supervising with lab postdocs	2018/2019
Hilary Dawson	UO	NSF PBI	Co-supervising with lab postdocs	2018/2019
Braden Prillwitz	UO	Honors thesis	Main advisor	2018
Alexia Gee	UO	NSF SPUR	Main advisor	2017
Robert Kubacki	UC Davis	Honors thesis	Main advisor	2017
Cecilia Gonzales	UC Davis	AggieMentors	Main advisor	2016

Student awards

Jamie Wright (2019) Travel Award 44th New Phytologist Symposium. Accra, Ghana.
Ori Chafe (2019) Best Poster Award. Climate Science Symposium. University of Oregon.
Adriana Uscanga Castillo (2018) Best Poster American Association of Geographers Conference.
Ori Chafe (2018) NSF Graduate Research Fellowships Program (GRFP) Award.
Schyler Reis (2017) Best presentation award on Disturbance and Resilience. Joint OR Campus Conference 2017.
Alexia Gee (2016) University of Oregon Summer Program for Undergraduate Research in Life Sciences (SPUR).
Tara Seely (2016) NSF Graduate Research Fellowships Program (GRFP) Award.
Laura Emberson (2016) Best poster award. Interdisciplinary Graduate and Professional Student Symposium (IGPS).
Cecilia Gonzales (2016) Best poster. UCD Aggiementors Symposium.
Cecilia Gonzales (2016). Emerging Env Leader Scholarship. National Council for Science and the Environment.

LANGUAGE SKILLS

Native or bilingual proficiency: *English*, *Portuguese*, *Spanish.*

Limited Working Proficiency: *Italian, German*