Professor of Earth, Environment, and Planetary Sciences phone: (713) 348-5234

Joint professor: BioSciences, & Chemistry fax: (713) 348-5214

Rice University MS 126 [masiello@rice.edu](mailto:masiello@rice.edu)

Houston, TX 77005 http://masiellolab.org

**EDUCATION**

Earlham College, B.A. with Honors (Math & Physics), 1991

University of North Carolina, Chapel Hill, M.S. (Environmental Science), 1993

University of California, Irvine, M.S. (Physical Chemistry), 1996

University of California, Irvine, Ph.D. (Earth System Science), 1999

**research and professional EXPERIENCE**

Postdoctoral Scholar, Center for Accelerator Mass Spectrometry, LLNL, 1999-2002

Postdoctoral Scholar, UC Santa Barbara Geography Department, 2002-2004

Visiting Scientist, CalTech Division of Geology and Planetary Sciences, 2001-2004

Visiting Scientist, CSIRO Land and Water, Adelaide, Australia, 2003

Assistant Professor, Rice University, Houston, TX Fall 2004-June 2012.

Associate Professor, Rice University, Houston, TX June 2012-June 2015.

Professor, Rice University, Houston, TX, July 2015-present.

Joint faculty, Chemistry department, Rice University, 2012-present.

Joint faculty, BioSciences department, Rice University, 2014-present.

**AWARDS**

2017 Fellow Geological Society of America

2002-2003 American Fellow, AAUW

**research INTERESTS**

•The development new tools to understand the cycling and fate of biogeochemically relevant elements in the Earth system with a focus on tools that allow scaling from microns to km;

•The application of these tools to both fundamental and applied problems related to water, energy, climate, and life on Earth.

**CURRENT RESEARCH SUPPORT**

1. *Synthetic Biology for Earth System Science.* P.I.s: C.A. Masiello, J.J. Silberg, G. Bennett, M. Bennett. $1 million. Keck Foundation.
2. *MRI: Acquisition of Time-of-Flight Secondary Ion Mass Spectrometer (TOF-SIMS) for high resolution 3-D materials analysis*. P.I.: R. Verduzco. Co-Is: C.-T. Lee, C.A. Masiello, J. Lou. $1,666,069. NSF MRI.
3. Impacts of Flood Damage on Airborne Fungi and Bacteria in Homes after Harvey. P.I. L. Stadler. Co-Is: Q. Li, J. Elliott, C.A. Masiello, N. Fierer. $50,000. Rice University HERE funds.

**PENDING RESEARCH SUPPORT**

1. *Antibiotic resistance gene propagation: in situ rates and networks of horizontal gene transfer in wastewater*. L.B. Stadler, J.J. Silberg, C.A. Masiello. $329,993. NSF CBET.

**COMPLETED RESEARCH SUPPORT**

1. *Pyrolytic Conversion of Soil Contaminated with Heavy Hydrocarbons into Biochar to Enhance Soil Fertility and Sequester CO2.* Lead P.I.s: Pedro Alvarez, Caroline Masiello, Kyriacos Zygourakis. Chevron. $75,000. 2014-2016.
2. *Biochar Amendment: A Sustainable Remediation Strategy for Shallow Soil Contamination by Heavy Hydrocarbons*, Lead P.I.s: Doug Mackay, Sanjai Parikh. Chevron. Masiello subcontract: $34,578.2014-2016.
3. *Effects of Characterized Biochars on Microbial Communication*. P.I.s: C.A. Masiello, J.J. Silberg. Shell P.I.: J. Wise. $75,000. 2014-2015.
4. *The effects of Charcoal on the Hydrologic Properties of Soils under Natural and Enhanced Conditions,* P.I.: C.A. Masiello, co-P.I. B. Dugan. NSF-HS, April 15, 2010 – June 31, 2015. $270,179.
5. *Rice Biochar: Expanding into Biology*. P.I. C.A. Masiello. Co-P.I.s: J.J. Silberg, K. Zygourakis, B. Dugan, H. Gonnerman, D. Wagner. Rice FIF. $50,000.
6. *Early Career: Acquisition of Shared, Basic Biogeochemistry Facilities at Rice University,* P.I.: C.A. Masiello, co-P.I.s John B. Anderson, Mason Tomson, Kenton Whitmire, Evan Siemann. NSF-EAR/IF, Jan. 1, 2010-Dec. 31, 2014, $100,000.
7. *Assessing the Impact of Developing-World Land Use on Riverine Organic Carbon Delivery to the Ocean.* P.I.: C.A. Masiello, co-P.I.s W.C. Hockaday and T.J. Perez. NSF-OCE 0928941, Jul. 1, 2009-Jun. 30, 2012. $389,261 ($349,261 to Rice).
8. *Effects of nitrogen management strategies on biofuel crop biochemistry and soil carbon stocks,* P.I.: C.A. Masiello. co-P.I. W.C. Hockaday. USDA AFRI, Jan. 1, 2011 - Dec. 31, 2013, $543,962 ($443,151 to Rice).
9. *Linking Climate Change to the Structure and Functioning of Native Communities*, P.I.: V. Rudolf. co-P.I.s A. Dunham, C.A. Masiello, R. Barnes. Rice Shell Center for Sustainability. $30,000.
10. *Stream Teams: Undergraduate-led Research on the Biogeochemistry of River Urbanization.* P.I.: R. Barnes. co-P.I.s C.A. Masiello, V. Colvin. $30,000.
11. *Investigating Biochar Impacts on Cell-Cell Communication.* P.I.: C.A. Masiello. Co-Is: J.J. Silberg, K. Zygourakis, J.A. Rudgers. Rice Institute of Biosciences and Bioengineering, $10,000, Oct 2011-Sept 2012.
12. *Enhancing the Quality of Marketable Products Derived from Mobile Fast Pyrolysis of Ligno-cellulosic Biomass*, Texas AgriLife Bioenergy Initiatives Program. P.I.: S. Capareda (TAMU); co-PIs: C.A. Masiello; T. Provin, D. Vietor, M. Palma (TAMU). Jan. 1, 2010 – Dec. 31, 2011, $330,000 ($10,000 to Rice).
13. *Optimizing the Logistics of a Mobile Fast Pyrolysis System for Sustainable Bio-crude Oil Production,* DOE SUN Grant program. P.I.: S. Capareda (TAMU); Co-PIs: C.A. Masiello; T. Provin, D. Vietor, M. Palma (TAMU). Jan. 1, 2009 – Dec. 31, 2011, $890,862 ($100,494 to Rice).
14. *The effects of land use change on the oxidative ratio of the terrestrial biosphere*, P.I.: C.A. Masiello. NSF DEB-0614524, Oct. 1, 2006 – Sept. 31, 2011, $400,000.
15. *The Rice International Visiting Fellows Program in Energy, the Environment, and Sustainability: Prototype Years 1&2*, Rice University Faculty Initiatives Fund, co-P.I.s: C.A. Masiello and J.J. Silberg, May 2007-April 2010, $80,000.
16. *Carbon Sequestration Through Soil Biochar Amendment,* Rice University, June 2008-May 2009*,* co-P.I.s: K. Zygorakis, C.A. Masiello, and W.C. Hockaday. $50,190.
17. *Monitoring Engineered Nanoparticles in the Environment,* co-P.I.s: W.C. Hockaday, Q. Li, and C.A. Masiello. Shell Center for Sustainability,Rice University, April 2008-March 2009, $39,110.
18. *Genetic and Environmental Impacts on Lignin Accumulation,* co-P.I.s: J. Braam, J.A. Rudgers, C.A. Masiello. Shell Center for Sustainability, December 2008-December 2009, $32,200.
19. *Carbon isotopic measurements of dissolved inorganic carbon: A new tool to assess groundwater-river exchange in the Brazos River Basin. P.I. F.-W. Zeng. Co-I: C.A. Masiello, $15,000. Texas Water Research Institute. 2007-2008.*
20. *Mechanisms of soil carbon sequestration: optimizing soil carbon interactions with minerals and fungi*, co-P.I.s: C.A. Masiello and J.A. Rudgers. Rice University Energy and Environmental Systems Institute, $8,500. Sept. 2007 – Aug. 2008.
21. *Isolating AM fungi as keystone regulators of carbon sequestration in dune ecosystems*, co-P.I.s: J.A. Rudgers, C.A. Masiello, and S. Emery. Hamill Innovation Grant, Rice University Institute of Biosciences and Bioengineering, $21,460.
22. *Measuring the oxidative ratio of the terrestrial biosphere,* NSF DEB-0445282, P.I.: C.A. Masiello. April 1 2005 – September 30, 2006, $100,000.
23. *The oxidation state of soil organic carbon: a new proxy for carbon storage mechanisms and land use change.* P.I.: Oliver Chadwick, co-I.: C.A Masiello. collaborators Jim Randerson, Jeff Baldock. Kearney Foundation, $70,000, 2003-2005.
24. *Carbon cycle in soils: role of organic matter/noncrystalline interactions.* P.I.s: Isabelle Basile, Ronald Amundson, co-I.s: C.A. Masiello, Armand Masion, Stefano Caldarelli, Daniel Borschneck, Jérome Balesdent, Cristina Castanha. source: France-Berkeley Fund, $10,000 2002-2003.
25. *Physical and chemical controls on carbon storage in U.S. soils,* P.I.: C.A. Masiello. American Association of University Women (AAUW) 2002-2003 American Fellowship, $30,000.
26. *Soil organo-mineral complexes as a predictor of soil carbon sequestration potential*, P.I.: C.A. Masiello, co-I.s: O.A. Chadwick and S.E. Trumbore, DOE CLE $71,554, 2001-2002.
27. *Stuffing carbon away: mechanisms of carbon sequestration in soils*. P.I.: C.A. Masiello. Co-I.s: John Southon, Margaret Torn, Oliver Chadwick, Jennifer Harden, Susan Trumbore. DOE LDRD $120,000, 2001-2002.
28. *Stuffing carbon away: how do mineralogy and precipitation control long-term carbon sequestration in soils?* P.I.: John Southon, co-I. C.A. Masiello, $163,000. Source: LLNL LDRD 2000-2001. collaborators: Oliver Chadwick, Julia Gaudinski, Jennifer Harden, Susan Trumbore, Margaret Torn, Stuart Wakeham.
29. *Isotope and genetic studies to assess microbial carbon storage in natural and human-altered environments.* Co-P.I.s: Kathleen Treseder, C.A. Masiello, Michael F. Allen. source: LLNL minigrant. $12,510, 2000-2001.
30. *Char and graphitic soot black carbon dynamics in marine sediments.* P.I.: John Hedges, Co-I: C.A. Masiello. collaborators: Yves Gelinas, Angela Dickens. source: LLNL minigrant. $19,105, 2000-2001.
31. *Radiocarbon constraints on organic matter turnover in the Amazon River Basin: Model conceptualization and validation*. P.I.: John Hedges, co-I.s: C.A. Masiello, T. Brown. collaborators: Anthony Aufdenkampe, Emilio Mayorga. source: LLNL minigrant. $3,654, 2000-2001.
32. *Isotope geochemistry of the Santa Clara River*,P.I.: C.A. Masiello. Sigma Xi GIA award, $1,000, 1999-2000.

**PEER REVIEWED PUBLICATIONS**

ResearcherID: A-2653-2011; ORCID: orcid.org/0000-0003-2102-6229 \*indicates mentored student or postdoctoral researcher

1. Masiello, C.A. E.R.M. Druffel, and J.E. Bauer (1998), Physical controls on dissolved inorganic radiocarbon variability in the California Current, *Deep-Sea Research Pt II: Topical Studies in Oceanography, 45*, 617-642.
2. Masiello, C.A.*,* and E.R.M. Druffel (1998), Black carbon in deep-sea sediments, *Science, 280,* 1911-1913.
3. Bauer, J.E., E.R.M. Druffel, D.M. Wolgast, S. Griffin, and C.A. Masiello (1998), Distributions of dissolved organic and inorganic radiocarbon in the eastern North Pacific continental margin, *Deep-Sea Research Pt II: Topical Studies in Oceanography, 45,* 689-671.
4. Masiello, C.A., and E.R.M. Druffel (2001), The isotope geochemistry of the Santa Clara River, *Global Biogeochemical Cycles*, *15*, 407-416.
5. Masiello, C.A., E.R.M. Druffel, and L.A. Currie (2002), Radiocarbon measurements of black carbon in aerosols and ocean sediments, *Geochimica Cosmochimica Acta*, *66*, 1025-1036.
6. Currie, L.A., B.A. Benner, J.D. Kessler, D.B. Klinedinst, G.A. Klouda, J.V. Marolf, J.F. Slater, S.A. Wise, H. Cachier, R. Cary, J.C. Chow, J. Watson, E.R.M. Druffel, C.A. Masiello, T.I. Eglinton, A. Pearson, C.M. Reddy, O. Gustafsson, J.G. Quinn, P.C. Hartmann, J.I. Hedges, K.M. Prentice, T.W. Kirchstetter, T. Novakov, H. Puxbaum, and H. Schmid (2002), A critical evaluation of interlaboratory data on total, elemental, and isotopic carbon in the carbonaceous particle reference material, NIST SRM 1649a, *Journal of Research of the National Institute of Standards and Technology*, *107*, 279-298.
7. Schmidt, M.W.I., C.A. Masiello, and J.O. Skjemstad (2003), Final recommendations for reference materials in black carbon analysis, *EOS Transactions of the American Geophysical Union*, *84*, 582-583. *note: this is a publication, not a journal abstract.*
8. Masiello, C.A., and E.R.M. Druffel (2003), Organic and black carbon 13C and 14C through the Santa Monica Basin oxic-anoxic transition, *Geophysical Research Letters*, *30*, doi 10.1029/2002GL015050.
9. Treseder, K.K., C.A. Masiello, J.L. Lansing, and M.F. Allen (2004), Species-specific measurements of ectomycorrhizal turnover under N-fertilization: combining isotopic and genetic approaches, *Oecologia*, *138*, 419-425.
10. Wakeham, S.G., J. Forrest, C.A. Masiello, Y. Gelinas, C.R. Alexander, and P. R. Leavitt (2004), Hydrocarbons in Lake Washington sediments. A 25-year retrospective in an urban lake, *Environmental Science & Technology*, *38*, 431-439.
11. Baldock, J.A., C.A. Masiello, Y. Gélinas, and J.I. Hedges (2004), Cycling and composition of organic matter in terrestrial and marine ecosystems, *Marine Chemistry*, *92*, 39-64, 10.1016/j.marchem.2004.06.016.
12. Dickens, A.F., Y. Gelinas, C.A. Masiello, S. Wakeham, and J.I. Hedges (2004), Reburial of fossil organic carbon in marine sediments, *Nature*, *427*, 336-339.
13. Masiello, C.A., O.A. Chadwick, J. Southon, M.T. Torn, and J.W. Harden (2004), Weathering Controls on Mechanisms of Carbon Storage in Grassland Soils, *Global Biogeochemical Cycles*, *18*, doi: 10.1029/2004GB002219.
14. Masiello, C.A. (2004), New directions in black carbon organic geochemistry, *Marine Chemistry*, *92*, 201-213.
15. Basile-Doelsch, I., R. Amundson, W.E.E. Stone, C. A. Masiello, J.Y. Bottero, F. Colin, F. Masin, D. Borschneck, and J.D. Meunier (2005), Mineralogical control of organic carbon dynamics in a volcanic ash soil on La Reunion, *European Journal of Soil Science*, *56*, 689-703.
16. Mayorga, E., A.K. Aufdenkampe, C.A. Masiello, A.V. Krusche, J.I. Hedges, P.D. Quay, J.E. Richey, and T.A. Brown (2005), Young organic matter as a source of carbon dioxide outgassing from Amazonian rivers, *Nature*, *436*, 538-541.
17. Treseder, K.K., M.S. Torn, and C.A. Masiello (2006), An ecosystem-scale radiocarbon tracer to test use of litter carbon by ectomycorrhizal fungi, *Soil Biology & Biochemistry*, *38*, 1077-1082.
18. Randerson, J.T., C.A. Masiello, C.J. Still, T. Rahn, H. Poorter, and C.B. Field (2006), Is carbon within the global terrestrial biosphere becoming more oxidized? Implications for trends in atmospheric O-2, *Global Change Biology*, *12*, 260-271.
19. Schmidt, M.W.I., and C.A. Masiello (2007), Interdisciplinary Intercomparison of Black Carbon Analysis in Soil and Sediment, *Eos Trans. AGU*, *88*, 344, doi:10.1029/2007EO350006.\**this is a peer-reviewed article, not an abstract.*
20. Czimczik, C.I., and C.A. Masiello (2007), Controls on black carbon storage in soils, *Global Biogeochemical Cycles*, *21.*
21. Hammes, K., M.W.I. Schmidt, R.J. Smernik, L.A. Currie, W.P. Ball, T.H. Nguyen, P. Louchouarn, S. Houel, O. Gustafsson, M. Elmquist, G. Cornelissen, J. O. Skjemstad, C.A. Masiello, J. Song, P. Peng, S. Mitra, J.C. Dunn, P.G. Hatcher, \*W.C. Hockaday, D. M. Smith, C. Hartkopf-Froeder, A. Boehmer, B. Luer, B. J. Huebert, W. Amelung, S. Brodowski, L. Huang, W. Zhang, P.M. Gschwend, D.X. Flores-Cervantes, C. Largeau, J.N. Rouzaud, C. Rumpel, G. Guggenberger, K. Kaiser, A. Rodionov, F.J. Gonzalez-Vila, J.A. Gonzalez-Perez, J.M. de la Rosa, D.A.C. Manning, E. Lopez-Capel, and L. Ding (2007), Comparison of quantification methods to measure fire-derived (black/elemental) carbon in soils and sediments using reference materials from soil, water, sediment and the atmosphere, *Global Biogeochemical Cycles*, vol *21; doi: 10.1029/2006GB002914.*
22. Masiello, C.A., \*M.E. Gallagher, J.T. Randerson, \*R.M. Deco, and O.A. Chadwick (2008), Evaluating two experimental approaches for measuring ecosystem carbon oxidation state and oxidative ratio, *Journal Of Geophysical Research-Biogeosciences*, *113,* G03010, doi: 10.1029/2007JG000534.
23. Schreiner, K.M., T.R. Filley, R.A. Blanchette, B.B. Bowen, R.D. Bolskar, \*W.C. Hockaday, C.A. Masiello, and J.W. Raebiger (2009) White-Rot Basidiomycete-mediated Decomposition of C60 Fullerol. *Environmental Science and Technology, 43(9)*, 3162-3168.
24. \*Hockaday, W.C., C.A. Masiello, J.T. Randerson, R.J. Smernik, J.A. Baldock, O.A. Chadwick, J.W. Harden (2009) The measurement of soil carbon oxidation state and oxidative ratio by nuclear magnetic resonance. *Journal of Geophysical Research-Biogeosciences,**114*, G02014, doi: 10.1029/2008JG000803.
25. \*Zeng, F.-W. and C.A. Masiello (*2010*) CO2 evasion from two subtropical rivers in North America. *Biogeochemistry.* doi: 10.1007/s10533-010-9417-6.
26. Kane, E.S., \*W.C. Hockaday, M.R. Turetsky, C.A. Masiello, D.W. Valentine, B.P. Finney, J.A. Baldock (*2010*) Topographic controls on black carbon accumulation in Alaskan black spruce forest soils: implications for organic matter dynamics. *Biogeochemistry, 100, 39-56.* doi: 10.1007/s10533-009-9403-z.
27. Nguyen, B.T., J. Lehmann, \*W.C. Hockaday, S. Joseph, C.A. Masiello (2010)Temperature sensitivity of black carbon decomposition and oxidation. *Environmental Science and Technology, 44(9)*, 3324-3331, doi: 10.1021/es903016y.
28. \*Gallagher, M.E., \*W.C. Hockaday, C.A. Masiello, S. Snapp, C.P. McSwiney, J.A. Baldock. (*2011*) Biochemical Suitability of Crop Residues for Cellulosic Ethanol: Disincentives to Nitrogen Fertilization in Corn Agriculture. *Environmental Science and Technolog*y, 45, 2013-2020, doi:10.1021/es103252s.
29. \*Zeng, F.-W., C.A. Masiello, and \*W.C. Hockaday (2011) Controls on the origin and cycling of riverine dissolved inorganic carbon in the Brazos River, Texas. *Biogeochemistry*, 104, 275-291, doi:10.1007/s10533-010-9501-y.
30. \*Dong, L., \*W.C. Hockaday, C.A. Masiello, P.J.J. Alvarez (2011) Earthworm avoidance of biochar can be mitigated by wetting. *Soil Biology and Biochemistry*, 43, 1732-1737, doi: 10.1016/j.soilbio.2011.04.019.
31. Lehmann, J., M. Rillig, J. Thies, C.A. Masiello, \*W.C. Hockaday, and D. Crowley (2011) Biochar effects on soil biota -- a review. *Soil Biology and Biochemistry*, 43, 1812-1836, doi: 10.1016/j.soilbio.2011.04.022*.*
32. \*Kinney, T.J., C.A. Masiello, B. Dugan, \*W.C. Hockaday, \*M.R. Dean, K. Zygourakis, and \*R.T. Barnes (2012). Hydrologic properties of biochars produced at different temperatures. *Biomass and Bioenergy*, 41, 34-43, doi: 10.1016/j.biombioe.2012.01.033.
33. \*Sun, H., W.C. \*Hockaday, C.A. Masiello, and K. Zygourakis. (2012) Multiple controls on the chemical and physical structure of biochars. *Industrial & Engineering Chemistry Research*, 51(9), 3587-3597, doi: 10.1021/ie201309r.
34. Koarashi, J., \*W.C. Hockaday, C.A. Masiello, and S.E. Trumbore (2012) Dynamics of decadally cycling carbon in subsurface soils. *JGR-Biogeosciences,* 117, G03033, doi:10.1029/2012JG002034.
35. \*LeCroy, C., C.A. Masiello, J.A. Rudgers, W.C. Hockaday, J.J. Silberg (2013) Nitrogen, biochar, and mycorrhizae: alteration of the symbiosis and oxidation of the char surface. *Soil Biol. Biochem.* 58, 248-254, doi: 10.1016/j.soilbio.2012.11.023.
36. Webber, J.B.W., Corbetter, P., Semple, K.T., Ogbonnaya, U., Teel, W.S., Masiello, C.A., Fisher, Q.J., Valenza J.J. II, Song, Y.-Q., Hu, Q. An NMR study of porous rock and biochar containing organic material (2013) *Microporous and Mesoporous Materials* 178, 94-98, doi: 10.1016/j.micromeso.2013.04.004.
37. Budai, A., A.R. Zimmerman, A.L. Cowie, J.B.W. Webber, B.P. Singh, B. Glaser, C.A. Masiello, D. Andersson, F. Shields, J. Lehmann, M. Camps Arbestain, M. Williams, S. Sohi, S. Joseph. [Biochar carbon stability test method: An assessment of methods to determine biochar carbon stability](http://www.biochar-international.org/sites/default/files/IBI_Report_Biochar_Stability_Test_Method_Final.pdf) (2013) International Biochar Initiative, Carbon Methodology Document. URL [www.biochar-international.org/sites/default/files/IBI\_Report\_Biochar\_Stability\_Test\_Method\_Final.pdf](http://www.biochar-international.org/sites/default/files/IBI_Report_Biochar_Stability_Test_Method_Final.pdf" \t "externObjLink).
38. Worrall, F., G.D. Clay, C.A. Masiello, G. Mynheer (2013) Estimating the oxidative ratio of the global terrestrial biosphere carbon – the global terrestrial carbon sink has been underestimated. *Biogeochemistry* 115(1-3), 23-32, doi: 10.1007/s10533-013-987-6.
39. Masiello, C.A., Y. Chen, X. Gao, S. Liu, \*S. Cheng, M.R. Bennett, J.A. Rudgers, D.S. Wagner, K. Zygourakis, J.J. Silberg (2013) Pyrolysis temperature determines biochar effects on microbial communication. *ES&T*, 47, 11496-11503, doi: 10.1021/es401458s.
40. Schneider, M.P.W., \*L.A. Pyle, K. Clark, \*W.C. Hockaday, C.A. Masiello, M.W.I. Schmidt (2013) Towards a ‘Molecular Thermometer’ to estimate the charring temperature of wildfire charcoals. *ES&T*, 47, 11490-11495, doi: 10.1021/es401430f.
41. Coppola, A.I., L.A. Ziolkowski, C.A. Masiello, E.R.M. Druffel (2014) Aged black carbon in marine sediments and sinking particles. *Geophys. Res. Lett.*, 41(7), 2427-2433, doi: 10.1002/2013GL059068.
42. \*Brewer, C.E., \*Chuang, V.J., C.A. Masiello, H. Gonnermann, X. Gao, B. Dugan, \*L.E. Driver, P. Panzacchi, K. Zygourakis, C.A.Davies (2014) New approaches to measuring biochar density and porosity. *Biomass & Bioenergy*, 66, 176-185, DOI: 10.1016/j.biombioe.2014.03.059.
43. Masiello, C.A., Dugan, B., \*Brewer, C.E., Spokas, K., Novak, J.M., \*Liu, Z., \*Sorrenti, G. Biochar effects on Soil Hydrology. In Biochar for Environmental Management, ed. Johannes Lehmann, published by Earthscan. in press, 2015.
44. Spokas, K.A., J.M. Novak, C.A. Masiello, M.G Johnson, E.C. Colosky, J.A. Ippolito, C. Trigo (2014) Physical disintegration of biochar: an overlooked process. *Environmental Science and Technology Letters*, 1, 326-332, DOI: 10.1021/ez500199t.
45. \*Gallagher, M.E., C.A. Masiello, \*W.C. Hockaday, S. Snapp, C.P. McSwiney, and J.A. Baldock (2014) Controls on the oxidative ratio of net primary production in agricultural ecosystems. *Biogeochemistry,* 121(3), 581-594, DOI: 10.1007/s10533-014-0024-9.
46. \*Barnes, R.T., \*M.E. Gallagher, C.A. Masiello, \*Z. Liu, B. Dugan (2014) Biochar-induced changes in hydraulic conductivity and dissolved nutrient fluxes constrained by laboratory experiments. *PLOS One,* DOI: 10.1371/journal.pone.0108340.
47. Williams, E.K., B.E. Rosenheim, A.P. McNichol, C.A. Masiello (2014) Charring and non-additive chemical reactions during ramped pyrolysis: applications to the characterization of sedimentary and soil organic material. *Organic Geochemistry,* 77, 106-114, DOI: 10.1016/j.orggeochem.2014.10.006.
48. Wiedemeier, D.B., S. Abiven, W.C. Hockaday, M. Keiluweit, M. Kleber, C.A. Masiello, A.V. McBeath, P.S. Nico, \*L.A. Pyle, M.P.W. Schneider, R.J. Smernik, G.L.B. Wiesenberg, M.W.I. Schmidt (2015) Aromaticity and the degree of aromatic condensation of chars. *Organic Geochemistry,* 78, 135-143, DOI: 10.1016/j.orggeochem.2014.10.002.
49. Hockaday, W.C., \*M.E. Gallagher, C.A. Masiello, J.A. Baldock, C.M. Iversen, R.J. Norby (2015). Forest soil carbon oxidation state and oxidative ratio responses to elevated CO2. *JGR-Biogeosciences*, 120 (9), 1797-1811, DOI: 10.1002/2015JG003010.
50. *\**Sun, H., \*C. Brewer, C.A. Masiello, and K. Zygourakis. Nutrient Transport in Soils Amended with Biochar: A transient model with two stationary phases and intraparticle diffusion (2015) *Industrial Engineering and Chemistry Research*, 54(16), 4123-4135, DOI: 10.1021/ie503893t.
51. \*Pyle, L.A., Hockaday, W.C., Boutton, T., Zygourakis, K., \*Kinney, T. J., & Masiello, C.A. (2015). Chemical and Isotopic Thresholds in Charring: Implications for the Interpretation of Charcoal Mass and Isotopic Data. *Environmental Science and Technology*, *49*(24), 14057–14064. DOI: 10.1021/acs.est.5b03087
52. Santin, C., Doerr, S.H., Kane, E.S., Masiello, C.A., Ohlson, M., Rosa, J.M., C.M. Preston, T. Dittmar. (2016). Towards a global assessment of pyrogenic carbon from vegetation fires. *Global Change Biology*, *22*(1), 76–91. DOI: 10.1111/gcb.12985.
53. \*Liu, Z., Dugan, B., Masiello, C.A., & \*Barnes, R.T. (2016). Impacts of biochar concentration and particle size on hydraulic conductivity and DOC leaching of biochar–sand mixtures. *Journal of Hydrology*, *533*, 461–472.DOI: 10.1016/j.hydrol.2015.12.007.
54. Gao, X., Norwood, M., Frederick, C., McKee, A., Masiello, C.A., & Louchouarn, P. (2016). Organic geochemical approaches to identifying formation processes for middens and charcoal-rich features. *Organic Geochemistry*, *94*(C), 1–11. DOI: 10.1016/j.orggeochem.2016.01.007
55. \*Vidonish, J.E., K. Zygourakis, C.A. Masiello, X. Gao, J. Mathieu, P.J.J. Alvarez (2016) Pyrolytic treatment and fertility enhancement of soils contaminated with heavy hydrocarbons*,* 50(5)*,* 2498–2506. *Environmental Science & Technology.* **DOI:** 10.1021/acs.est.5b02620.
56. \*Sorrenti, G., C.A. Masiello, M. Toselli (2016) Biochar interferes with kiwifruit nutrition in calcareous soil. *Geoderma.* 272, 10-19, [DOI:10.1016/j.geoderma.2016.02.017](http://dx.doi.org/10.1016/j.geoderma.2016.02.017" \t "doilink).
57. Gao, X., and C.A. Masiello. ”Chapter 19: Analysis of biochar porosity by pycnometry”, in *Biochar: a Guide to Analytical Methods*, edited by Balwant Singh, Marta Camps, and Johannes Lehmann, *2017.*
58. \*Sorrenti, G., C.A. Masiello, B. Dugan, M. Toselli (2016). Biochar physico-chemical properties as affected by environmental exposure. *Science of the Total Environment, 563-564*, 237-246, DOI[:10.1016/j.scitotenv.2016.03.245](http://dx.doi.org/10.1016/j.scitotenv.2016.03.245" \t "doilink)
59. \*Cheng, H.-Y., C.A. Masiello, G.N. Bennett, J.J. Silberg (2016), Using volatile gas production to report on horizontal gene transfer dynamics in soil. *Environmental Science and Technology*, 50, 850-8759, DOI: 10.1031/acsest.6b01415.
60. Gao, X., \*H.Y. Cheng, \*I. Del Valle, S. Liu, C.A. Masiello, J.J. Silberg (2016). Charcoal disrupts soil microbial communication through multiple mechanisms. *ACS-Omega,* 1, 226-233, DOI: 10.1021/acsomega.6b00085.
61. \*Vidonish, J., K. Zygourakis, C.A. Masiello, G. Sabadell, P.J.J. Alvarez (2016). Thermal treatment of hydrocarbon-impacted soils: A review of technology innovation for sustainable remediation. *Engineering*, 2, 426-437, DOI: 10.1016/J.ENG.2016.04.005.
62. Hatton, P.-J., S. Chatterjee, T. Filley, K. Dastmalchi, A.F. Plante, S. Abiven, X. Gao, C.A. Masiello, S.W. Leavitt, K.J. Nadelhoffer, R.E. Stark, J.A. Bird (2016). Tree taxa and pyrolysis temperature interact to control the efficacy of pyrogenic organic matter formation. *Biogeochemistry*, 130-143, 103. DOI: 10.1007/s10533-016-0245-1.
63. Bell-Dereske, L., X. Gao, C.A. Masiello, R. Sinsabaugh, S. Emery, J.A. Rudgers (2016) Plant-fungal symbiosis affects litter decomposition during primary succession (2016). *Oikos.* 126, 801-811. DOI: 10.1111/oik.03648.
64. Valdez, Z., W.C. Hockaday, C.A. Masiello, M.E. Gallagher, G.P. Robertson (2017) Nitrogen fertilizer and harvesting intensity influence the accrual of soil carbon and nitrogen stocks in switchgrass cropping systems (2017). *BioEnergy Research*, 10, 456-465.DOI: 10.1007/s12155-016-9810-7.
65. Gao, X., L.E. Driver, I. Kasin, C.A. Masiello, \*L.A. Pyle, B. Dugan, and M. Ohlson. Effect of environmental exposure on charcoal density and porosity in a boreal forest (2017). *Science of the Total Environment,* 592, 316-325.
66. \*Suciu, L.G., R.J. Griffin, and C.A. Masiello. Regional background O3 and NOx in the Houston-Galveston-Brazoria (TX) region: A decadal-scale perspective (2017) *Atmospheric Chemistry and Physics,* 17, 6565-6581 DOI: 10.5194/acp-17-6565-2017.
67. \*Liu, Z., B. Dugan, C.A. Masiello, H. Gonnermann. Biochar particle size and porosity are both important in altering sandy soil water properties (2017). *PLoS ONE*, DOI: 10.1371/journal.pone.0179079.
68. Santín, C., S.H. Doerr, A. Merino, T.D. Bucheli, R. Bryant, P. Ascough, X. Gao, C.A. Masiello. Physicochemical properties and carbon sequestration potential differ between wildfire charcoals and slow-pyrolysis biochars (2017) *Scientific Reports*, 7, Article number 11233, DOI: 10.1038/s41590-017-10455-2.
69. \*Pourhashem, G., \*Q.Z. Rasool, R. Zhang, K.B. Medlock, D.S. Cohan, C.A. Masiello. Valuing the air quality impacts of biochar reductions in soil NO emissions (2017) *ES&T*, 51, 9856-9863, DOI: 10.1021/acs.est.7b00748.
70. \*Gallagher, M.E., \*F.L. Liljestrand, W.C. Hockaday, C.A. Masiello. Plant species, not climate, controls biomass oxidative ratios in deciduous and coniferous ecosystems (2017) *JGR-Biogeosciences*, 122 (9), 2314-2324, DOI: 10.1002/2017JG003847.
71. \*Pyle, L.A., \*K.L. Magee, \*M.E. Gallagher, W.C. Hockaday, C.A. Masiello. Short term changes in physical and chemical properties of soil charcoal support enhanced landscape mobility (2017) *JGR-Biogeosciences.*
72. \*Liu, Z., B. Dugan, C.A. Masiello, \*L.M. Wahab, H.M. Gonnermann, J.A. Nittrouer. Effect of freeze-thaw cycling on grain size of biochar (2018) *PLoS ONE.*
73. \*Cheng, H.-Y., C.A. Masiello, \*I. Del Valle, X. Gao, G.N. Bennett, and J.J. Silberg. Ratiometric gas reporting: a non-disruptive approach to monitor gene expression in soils. *In press, ACS Synthetic Biology.*

**COMMENTARY ARTICLES**

1. Masiello, C.A. (2007), Perspective: Carbon cycle - Quick burial at sea, *Nature*, *450*, 360-361.

2. Masiello, C.A and P. Louchouarn (2013), Perspective: Fire in the Ocean. *Science*, 340, 287-288.

**PROVISIONAL AND UTILITY PATENTS FILED**

1. Silberg, J.J., C.A. Masiello, and H.S. Cheng. Genetically-encoded biosensors that produce a volatile gas output using methyl halide transferases. *Invention disclosure submitted to Rice U. Tech Transfer, October 5th, 2013 (ID# 2014-35).* Provisional patent filed; utility patent filed 10-2014.

**media citations & Commentaries**

1. [Schmidt M.W](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Schmidt%20MW%22%5BAuthor%5D).I. “Biogeochemistry: carbon budget in the black” (2004) *Nature* 427:305-7.

2. [Raymond, P.A.](http://www.ncbi.nlm.nih.gov/pubmed?term=%22Schmidt%20MW%22%5BAuthor%5D) “Carbon cycle: the age of the Amazon's breath” (2005) *Nature* 436:538-41.

3. Boyd, J. “Amazon source of five-year-old river breath: Largest-ever river-carbon-dating survey pinpoints age of Amazonian CO2”, Rice News & Media relations(July 7, 2005).

4. “Amazon River Cycles Carbon Faster than Thought” NSF Press Release 05-126 (July 27, 2005)

*Additional coverage:* KUHF, The Economist, Science Daily, SciDev.net

5. Berger, E. “ENVIRONMENT, SCIENCE & SPACE / GLOBAL WARMING / Experts field climate questions” Houston Chronicle (June 12, 2007)

6. Kever, J. “At Rice, women are in demand: More female scientists sought there, across U.S. to fill university faculty positions” Houston Chronicle (July 28, 2008)

7. Clemmons, M. “Visiting professors program seeks funding to continue” Rice Thresher (November 14, 2008).

8. Boyd, J. “Rice team gets top prize in 'Recycle Ike' contest” Rice News & Media relations(December 11, 2008).

*Additional coverage:* Houston Chronicle, Houston Business Journal, Waste Age Magazine

10. Williams, M. “Buried shells in Houston are no treasure” Rice News & Media relations(April 2, 2010).

*Additional coverage:* Futurity

11. Boyd, J. “A river flipped: humans trump nature on Texas river*”* Rice News & Media relations(August 13, 2010).

*Additional coverage:* US News, Science Daily, Futurity, SolveClimate.

12. Williams, M. "Overfertilizing corn undermines ethanol" Rice News & Media relations (February 28, 2011).

*Additional coverage:* C&E News, Futurity, US News and World Report.

13. Boyd, J. “Cooking better biochar: Study improves recipe for soil additive,” Rice News & Media relations (March 22, 2012).

14. Nuwer, Rachel. “Years after slash-and-burn, Brazil haunted by black carbon,” Science Now. August 12, 2012. (http://news.sciencemag.org/sciencenow/2012/08/years-after-slash-and-burn-brazi.html?ref=hp.)

15. Boyd, J. “Biochar quiets microbes, including some plant pathogens” Rice News & Media relations (September 30, 2013).

16. Futurity, “Biochar in soil interrupts microbe chit-chat,” September 30, 2013.

17. Powell, K. “Kid-Friendly Digs,” *Nature*, 513, 575-577, 2014.

18. Boyd, J. “Biochar alters water flow to improve sand and clay,” http://news.rice.edu/2014/09/24/study-biochar-alters-water-flow-to-improve-sand-and-clay/ ,Rice News, 2014.

19. Futurity, “Biochar changes how water flows through soil”,http://www.futurity.org/biochar-soil-mystery-771462/, 2014.

20. Cernansky, R. “State of the Art Soil,” *Nature*, 571, 258-260, 2015.

21. Lewis, J. “The Coal that’s Good for the Planet,” PBS NovaNext, June 2015 (<http://www.pbs.org/wgbh/nova/next/earth/biochar/>).

22. Williams, M. “Biochar could clear the air in more ways than one,” http://news.rice.edu/2017/07/26/biochar-could-clear-the-air-in-more-ways-than-one-2/, Rice News, 2017.

23. Phys.org: “Biochar could clear the air in more ways than one,” <https://phys.org/news/2017-07-biochar-air-ways.html>, 2017.

24. Science Daily: “Biochar could clear the air in more ways than one,” <https://www.sciencedaily.com/releases/2017/07/170727102943.htm> , 2017.

25. Environmental News Network: “Biochar could clear the air in more ways than one,” <http://www.enn.com/agriculture/article/51980>, 2017.

26. Futurity: “Using biochar on farms may cut health costs,” <http://www.futurity.org/biochar-agriculture-pollution-1497332/>, 2017.

# 27. Bryce, E. “Farming with biochar reduces toxic gas that causes smog and acid rain,” *Anthropocene*, August 2017.

# 28. Guest on KUHF Houston Matters segment: “Scientists Issue ‘Second Notice’ On Looming Environmental Problems — What Role Can Houston Play In Solving Them?” November 30, 2017. https://www.houstonpublicmedia.org/articles/news/2017/11/30/253508/scientists-issue-second-notice-on-looming-environmental-concerns-what-role-does-houston-play/

**POST-DOCTORAL SCHOLARS ADVISED**

1. Bill Hockaday (2006-2010)

*Current position*: Associate Professor, Baylor University

2. Rebecca Barnes (2010-2011)

*Current position*: Assistant Professor, Colorado College.

3. Morgan Gallagher (2011-2014) jointly advised with R. Jackson, Duke.

4. Catie Brewer (2012-2013) jointly advised with K. Zygourakis (Chemical Engineering, Rice).

*Current position*: Assistant Professor, New Mexico State University

5. Valerie Huguet (2013-2014).

6. Ghasideh Pourhashem (2014-2017), jointly advised with Ken Medlock (Economics).

*Current position*: Assistant Professor, North Dakota State

**GRADUATE THESES ADVISED**

1. Morgan Gallagher (2004-2010)

*PhD Thesis*: "The Coupling of Carbon and Nitrogen Cycles in Agriculture: Crop Ecosystem Oxidative Ratio and the Effects of Fertilization on Biofuel Feedstock Quality," *defended November 2010*.

2. Fanwei Zeng (2005-2010)

*PhD Thesis*: "The Effects of Land Use and Human Activities on Carbon Cycling in Texas Rivers", *defended November 2010*

3. Hao Sun (2006-2011)

*Coadvised w. Kyriacos Zygourakis in Chemical and Biomolecular Engineering)*

4. Zuolin Liu (2011-2016)

*Coadvised w. Brandon Dugan*

5. Lacey Pyle (2012-2017)

6. Giovambattista Sorrenti, (2013-2015), U. Bologna

*Coadvised w. Moreno Toselli*

7. Hsiao-Ying Cheng (2013-present)

*Coadvised w. Joff Silberg in Biochemistry & Cell Biology/Bioengineering*

8. Loredana Suciu (2013-present)

*Coadvised w. Rob Griffin in Civil and Environmental Engineering*

9. Ilenne del Valle Kestra (2015-present)

*Coadvised w. Joff Silberg in Biochemistry & Cell Biology/Bioengineering*

10. Emily Fulk (2017- present)

*Coadvised w. Joff Silberg in Biochemistry & Cell Biology/Bioengineering*

**STUDENT AWARDS**

*Undergraduate students*

1. *Nita Clark*: Morris K. Udall Fellowship, 2007.

2. *Jeremy Caves*: Morris K. Udall Fellowship, 2008; Outstanding Undergraduate Student in Earth Science, 2008; Houston Geological Society Outstanding Student award, 2008; Torkild Rieber Award in Geology, 2009; Wagoner Foreign Study Scholarship, 2009.

3. *Chase LeCroy*: Torkild Rieber Award in Geology, 2011.

4. *Victoria Chuang*: DAAD RISE Scholarship, summer 2011; Eugen Merten Memorial Prize in Geology & Geophysics, 2011; Torkild Rieber Award in Geology, 2012; Wagoner Foreign Study Scholarship, 2012.

5. *Frasier Liljestrand:* Torkild Rieber Award in Geology, 2011; HGS Award, 2013.

6. *Laura Rodriguez:* Chevron Minority Scholarship, 2011.

*Graduate students*

1. *Morgan Gallagher*: AGU Outstanding Student Paper Award –Biogeosciences 2006; Edgar O’Rear Travel Grant, 2009; Douglas and Martha Lou Broussard Fellowship, 2009; Chevron Minority Scholarship, 2009; Department Service Award/Chairman’s Service Award, 2009.

2. *Fanwei Zeng*: Watt Fellowship, 2005; Mills Bennett Award 2008-9; BP America 2008 Summer Funding Award; Chevron Minority Fellowship, 2008.

3. *Kate Ziegelgruber*: Chevron Scholarship, 2011.

4. *Lacey Pyle*: Sam and Helen Worden fellowship, 2012-2013; Alliances for Graduate Education and the Professoriate Program Fellowship, 2012-2013; Houston Geological Society Calvert Scholarship; SIPES Foundation Earth Science Scholarship; Department service award, 2014; Graduate Education for Minorities Program Fellowship, 2015-2016; Carl Storm Fellowship (Gordon Conference travel award), 2016; Mills Bennett Hydrology Fellowship, 2016; Goldschmidt Conference Travel Grant, 2016; Douglas and Martha Lou Broussard Fellowship, 2017.

**THESIS COMMITTEE PARTICIPATION**

1. Karen Hammes, U. Zurich: Ph.D. reader, 2007

2. Lori Ziolkowski, U.C. Irvine: Ph.D. committee member, 2009

3. Jianwen Zou, Rice U. Ecology and Evolutionary Biology PhD. committee member, 2006

4. Somereet Nijjer, Rice U. Ecology and Evolutionary Biology PhD. committee member, 2006

5. Brandi Boyd, Rice U. Earth Science, M.S. committee member, 2007

6. Shagun Bhat, Rice U. Civil and Environ. Engineering, Ph.D. committee member, 2007.

7. Brad Michalchuk, Rice U. Earth Science, M.S. committee member, 2008

8. Mark G. Little, Rice U. Earth Science, Ph.D. committee member, 2008

9. Walter O'Hayer, Rice U. Earth Science, M.S. committee member, 2008

10. Kristi Millikan, Rice U. Earth Science, Ph.D. committee member, 2009

11. Davin Wallace, Rice U. Earth Science, Ph.D. committee member, 2010

12. Yuling Jia, Rice U. Civil and Envrion. Engineering, Ph.D. commitee member, 2010

13. Rebecca Minzoni, Rice U. Earth Science Ph.D. committee member, 2010-15

14. Dong Li, Rice U. Civil and Environ. Engineering, Ph.D. committee member, 2011

15. Kabindra Shakya, Rice U. Civil and Environ. Engineering, Ph.D. committee member, 2011

16. Kerri Crawford, Rice U. Ecology and Evolutionary Biology, Ph.D. commitee member, 2011

17. Wei Tang, Rice U. Civil and Envrion. Engineering, Ph.D. commitee member, 2011

18. Rosa Dominguez-Faus, Rice U. Civil and Envrion. Engineering, Ph.D. commitee member, 2011

19. Lizette Leon-Rodriguez, Rice U. Earth Science Ph.D. committee member, 2011

20. Lukas Dereske, Rice U. Ecology and Evolutionary Biology PhD committee member, 2011

21. Andrew Davitt, Rice U. Ecology and Evolutionary Biology PhD committee member, 2009

22. Onja Razafindratsima, Rice U. Ecology and Evolutionary Biology, Ph.D. committee member, 2012-15

23. Elizabeth K. Williams, Tulane, PhD committee member, 2012-14

24. Li Chen, Rice U Civil and Environmental Engineering, committee member, 2013

25. Inna Kurganskaya, Rice U. Earth Science Ph.D. committee member, 2013

26. Benjamin Lash, Rice U. Civil and Environmental Engineering M.S. committee member, 2013

27. Benjamin Slotnick, Rice U. Earth Science Ph.D. committee member, 2013-2015

28. Matthew Norwood, TAMU Oceanography Ph.D. committee member, 2013-2015

29. Danielle Goodspeed, Rice U. Biochemistry and Cell Biology Ph.D. committee member, 2014

30. Ayca Agar, Rice U. Earth Science M.S. committee member, 2014

31. Basak Karakuk Cevik, Rice U. Civil and Environ. Engineering Ph.D. committee member, 2015-2016

32. Heath Hopson, Rice U. Earth Science M.S. committee member, 2016-present

33. Emily Schultz, Rice U. BioSciences Ph.D. committee member, 2015-current

34. Quazi Rasool, Rice U. Civil and Environmental Engineering Ph.D. committee member, 2015-current

35. Therese Lamperty, Rice U. BioSciences Ph.D. committee member, 2016-present.

36. Taminulosala Longjohn, Rice U. Earth Science M.S. committee member, 2016-2017.

37. Boda Li, Rice U. Earth, Environment, and Planetary Sciences Ph.D. committee member, 2017-present.

**UNDERGRADUATE STUDENTS ADVISED**

1. Rachel Deco, Geology and Planetary Science major, CalTech (2002-2004)
2. Nita Clark, Coastal Studies Major, Louisiana State University (summer 2005)
3. LaQuanti Calligan, Chemistry Major, Texas Southern University (2006-2008)
4. Sarita Minor, Biochemistry major, Univ. Houston (summer 2007)
5. Krystle Hodge, Chemistry major, Univ. Houston (summer 2007)
6. Jeremy Caves, Earth Sciences major (2007-2009)
7. Lacey Pyle, Earth Science major (2007-2010)
8. Joshua Ozer, Century Scholar, Rice University (2007)
9. Lila Kerr, Century Scholar, Rice University (2008)
10. Timothy Kinney, Physics major, Rice University (2009-2010)
11. Victoria Solorzano, Chemical & Biomolecular Eng. major, Rice Univ. (summer 2009)
12. Chase LeCroy, Earth Science major, Rice University (2009-2011)
13. Felix Alberto Eyzaguirre, Chemical & Biomolecular Eng. Major, Rice Univ.(2010-2011)
14. Victoria Chuang, Earth Science major, Rice Univ., (2009-2012)
15. Nathaniel R. Adams Jr., Earth Science and Civil & Environ. Major, Rice Univ. (2010-2012)
16. John Nicholas Irza, Earth Science Major, Rice Univ. (summer 2011)
17. Frasier Liljestrand, Earth Science Major, Rice Univ. (2011-2013)
18. Rachael Startin, Chemical & Biomolecular Engineering major, Rice Univ. (summer 2011)
19. Agar Woda, Chemical & Biomolecular Engineering major, Rice Univ. (2011-2013)
20. Laura Rodriguez, Earth Science major, Rice Univ., (2011-2013)
21. Tierra Moore, Earth Science major, Rice Univ., (2011-2015)
22. Amy Hilton, Earth Science major, Rice Univ., (2012-2014)
23. Leila Wahab, Earth Science major, Rice Univ., (2015-present)
24. Larisa LaMere, Earth Science major, Rice Univ., (2014-2016)
25. Amy Kuritsky, Environmental Science major, Rice Univ., (2017)
26. Sam Zapp, Earth, Environmental and Planetary Sciences major, Rice Univ., (2017-present)
27. Jennifer Kroeger, Earth, Environmental and Planetary Sciences major, Rice Univ., (2017-present)
28. Kendra Baldwin, Earth, Environmental and Planetary Sciences major, Rice Univ., (2017-present)
29. Naod Araya, Earth, Environmental and Planetary Sciences major, Rice Univ. (2018-present)
30. Abril Dominguez, undeclared major, Rice Univ., (2918-present)

**K-12 TEACHERS MENTORED**

1. Michelle R. Dean, Bellaire High School, Houston ISD, Summer 2009
2. Irene Fong, Pin Oak Middle School, Houston ISD, Summer 2013
3. Laura Driver, Cinco Ranch High School, Katy ISD, Summer 2013, 2014
4. Yokira Shorter, Liestman Elementary School, Alief ISD, Summer 2014
5. Isias Cerdas, Sam Houston Elementary School, Galena Park ISD, Summer 2015
6. Natalie Johnson, Beneke Elementary School, Spring ISD, Summer 2016.
7. Chetan Sawheny, Oates Elementary School, Houston ISD, Summer 2017.

**TEACHING EXPERIENCE**

|  |  |
| --- | --- |
| ESCI/BIOS/ENST 340: Global Biogeochemical Cycles | This junior/senior level course covers global-scale nutrient cycling, focusing on major nutrients (C, N, P). I also introduce enough oceanic, atmospheric, and soil chemistry and physics to understand the mechanisms controlling major light element cycling in the Earth. Each year has a different theme; for example, biofuels. *3 credits; taught every fall from 2005-2012 and then 2016- to present.* |
| CHEM/ESCI/ENST 425: Organic Geochemistry | This senior undergrad/intro grad course uses the history of the Earth and the Earth’s future climate as frameworks to study the organic chemistry of the Earth. We explore topics such as what can be learned about the very early history of life through molecular fossils preserved in ancient rocks, and the impact of fossil fuel CO2 on the chemistries of forests and grasslands. This is a writing-intensive course involving the creation of a large portfolio of professional writing. *3 credits; taught every other spring from 2006-present.* |
| ESCI 580: Pitching Your Science | This public speaking class prepares senior graduate students to communicate their research effectively to multiple audiences: professional society meetings, potential employers, workplace supervisors, and the media. *2 credits: taught biannually from 2016-present.* |
| ESCI/ENST 102:  History of the Earth and Life | This is an introductory Earth history course filling a natural science distribution requirement. This class follows the themes of plate tectonics and the evolution of life, looking at how we use both theoretical frameworks to understand past and present Earth processes.  *3 credits; co-taught every spring with Brandon Dugan from 2005-2012.* |
| ESCI 321: Earth Systems and Cycles | This is a required upper-division Earth Science major course covering biogeochemistry and sedimentary geology. *3 credits; co-taught 2010 with John Anderson.* |
| ESCI 555: Carbon and Climate | This course discusses feedbacks between the carbon cycle and Earth System climate. *3 credits taught in 2005.* |
| ENST 113: Global Climate Change | This freshman seminar uses two popular science texts, *Collapse*, by Jared Diamond, and *Plows, Plagues, and Petroleum*, by William F. Ruddiman, to introduce basic concepts of climate. *1 credit, co-taught with Brandon Dugan fall 2006.* |
| ENST 113: Water Crisis | This freshman seminar uses three popular science texts, *Fresh Water*, by E.C. Pielou, *Thirsty Planet*, by C.E. Hunt, and *Water*, by Marq de Villiers, to introduce the hydrologic cycle.*1 credit, co-taught with Brandon Dugan spring 2005.* |
| ESCI 530: CO2 Exchange Between the Atmosphere and Water Bodies | This seminar uses *Aquatic Chemistry* by Stumm and Morgan to begin discussion about the role of water in the carbon cycle. *1 credit, taught spring 2007.* |
| ESCI 530: Texas Prairies | This seminar covers C, N, and nutrient cycling in prairies, focusing especially on regional prairies. The course includes a field trip to the Katy Prairie Conservancy.  *1 credit, taught spring 2006.* |
| ESCI 514: Advanced Topics in Biogeochemistry | This course is an introduction to biogeochemistry for graduate students with a strong background in the physical and biological sciences.  *3 credits; taught fall 2013* |
| FWIS 187: History and Science of Houston’s Bayous | This freshman writing intensive seminar is a field-focused class on the complexities surrounding effective management of watersheds in cities.  *3 credits; taught three times from 2014-2015.* |
| ESCI 491: Environmental Science Major Capstone | This senior level undergraduate capstone course is composed of 4 modules on topics in environmental science, with the topics varying according to student interest. In each module students research the scientific and social dimensions of an environmental topic, interview an expert related to the topic, and write a synthetic review arguing their opinion on the topic, anchored in the literature. |

**PROFESSIONAL SOCIETIES**

American Geophysical Union, Geological Society of America, American Chemical Society, Ecological Society of America, ISME, American Association of University Women

##### **EXTERNAL SERVICE**

*Editorial Review Board:*  Biogeochemistry, 2011-present.

*Ad hoc journal reviewing*: Science, Nature, Nature Communications, Organic Geochemistry, Geophysical Research Letters, Biogeochemistry, Geochimica et Cosmochimica Acta, Radiocarbon, Global Biogeochemical Cycles, Environmental Science & Technology, Soil Biology and Biochemistry, Paleoceanography, Global and Planetary Change, JGR-Atmospheres, JGR-Biogeosciences.

*Ad hoc proposal reviewing*: National Science Foundation (EAR, DEB, OCE, ETBC, ATM, HS, OISE); Research Corporation for Science Advancement, Petroleum Research Foundation; Civilian Research and Defense Foundation; LLNL minigrant fund; National Institute for Climatic Change Research (DOE NICCR); Netherlands Innovational Research Incentive Scheme (NWO VIDI).

*Review panels*: NSF EAR and BIO panel service (2004, 2008, 2009, 2013, 2017), DOE Biological and Environmental Research Grand Challenge Workshop: strategic planning for DOE research for the next 20 years (2010), DOE Terrestrial Ecosystem Science Review Panel (2012), Gulf of Mexico Research Initiative Review Panel (2012).

*Board Memberships:*

PROGRESS (PROmoting Geoscience Research Education & SuccesS), advisory board member, 2016-present.

EcoFAB Steering Committee: Model ecosystems to advance microbiome science. <http://eco-fab.org/> 2017-present.

International Biochar Initiative Science Advisory Board: member, 2017-present.

*Steering Committees*: Co-Chair, Int’l Steering Committee for Black Carbon Reference Materials (1999-2007).

*Symposia*: Host and organizer of UC-wide symposium: *Mechanisms of Carbon Sequestration in Soils* (2001); Host and organizer of Rice-Texas A&M – Galveston joint symposium: *Charcoal and Nanocarbon: Shared Geochemistries of Rings in the Environment* (2006).

**UNIVERSITY SERVICE**

*Construction of Environmental Science Major:* 2015-present. Working with team of faculty from 2 schools and multiple departments to create a stand-alone Environmental Science major at Rice. Managed process through to Board of Trustees Approval in Spring 2016.

*Department committees (7)*: Chair, seminar committee (2 years); member, senior search committee (1 year), junior search committee (7 years), graduate committee (3 years), Department ombuds (4 years), Industry-Rice Earth Science Symposium (IRESS) committee (2 years). Outside search committees: Civil and Environmental Engineering faculty search committees (3 years), Ecology and Evolutionary Biology junior search committee, Math junior search committee.

*Faculty Hiring Committees:* Regular service on search committees for Earth Science (8), Civil and Environmental Engineering (3), Ecology and Evolutionary Biology (1), Math (1).

*Institutional Development:* Created, fundraised, and co-directed the Rice International Visiting Fellows Program on Energy, the Environment, and Sustainability.

*School of Natural Sciences committees (2)*: Rice Energy Program, ADVANCE institutional transformation development committee.

*University committees (5)*: Steering committee, Center for Energy and Environmental Research in the Human Sciences (CEHNS), Shared Equipment Authority (SEA, 2007-2016) Advisory Committee, Energy and Environmental Systems Institute (EESI) Advisory Committee (3 years), Engineering Dean’s review committee (2016), Committee on Undergraduate Curriculum (2015-2017), Rice University Carbon Advisory Panel (2016-present), Field Research Safety Committee (2017-present).

*Ad hoc committee service (4):* Rice-Shell Strategic Planning Committee (through VPR office), Presidential Ad Hoc Advisory Committee on the Status of Faculty Women; Childcare Committee, ADVANCE recruitment committee.

**FIELD SITES AND CRUISE HISTORY**

4-river land use transect in Venezuela Nutrients, organic matter 13C NMR, C isotopes

Temple Prairie elevated CO2 site Organic matter 13C NMR, ecosystem OR

ORNL FACE Organic matter 13C NMR, ecosystem OR

Houston urban & rural bayous Nutrients, organic matter 13C NMR, C isotopes

Kellogg Biological Station Organic matter 13C NMR, ecosystem OR

Santa Cruz, CA soil marine terraces Soil/solution sampling for C & 14C analyses 2001-4

Mattole River, CA soil marine terraces Soil sampling for C and 14C analyses, May 2000

Santa Clara River (coastal CA) 1997-98 El Niño: river organic carbon sampling

BOREAS N. Manitoba site Soil sampling, August 1994.

*R/V Melville*  1996,1999 68 days (2 cruises) in Cent. Pacific, South. Ocean

*R/V Revelle* 1996 7 days in Santa Monica, Santa Barbara Basins

*R/V New Horizon* 1995, 96, 98 29 days (3 cruises) Station M (Northeastern Pacific)

**INVITED TALKS**

presenting authors underlined; Masiello *students/postdocs* in italics

1. C.A. Masiello. Black Carbon in Ocean Sediments and a Small River, Dissertation Symposium in Chemical Oceanography (DISCO XV) NSF/ONR/NOAA, Honolulu, Hawaii, May 1999.

2. C.A. Masiello. New Directions in Black Carbon Organic Geochemistry. Friday Harbor Symposium in honor of John Hedges: New Directions in Marine Biogeochemistry, August 2003.

3. M.W.I. Schmidt and 25 others, including C.A. Masiello, Comparative Analyses of Reference Materials for Organic Geochemical Studies of Black Carbon. European Geoscience Union, Vienna, Austria, April 25, 2005.

4. C.A. Masiello, Czimczik, C. Building a Black Soil. European Geoscience Union, Vienna, Austria, April 25, 2005.

5. C. Czimczik, C.A. Masiello. Why are There No Black Soils in the Boreal Regions? European Union Symposium: Charcoal to Black Carbon: Defining Common Issues in Quantification and Interpretation in Archaeological, Palaeoenvironmental and Carbon Cycle Research. University of St. Andrews, Edinburgh, Scotland, August 2005.

6. C.A. Masiello, Measuring the Carbon Oxidation State of the Earth System. Texas A&M Galveston, May 2, 2006.

7. C.A. Masiello, Measuring the Carbon Oxidation State of the Earth System (and KBS). Kellogg Biological Station, Michigan State University, April 29, 2006.

8. C.A. Masiello, C. Czimczik, How to Build a Black Soil. Rice U/TAMU-Galveston joint BC-nanocarbon symposium, 2006.

9. C.A. Masiello, Greenhouse Gases and the Carbon Cycle. MIT Enterprise Forum of Texas, Sept. 20, 2006.

10. C.A. Masiello. Fate of Fossil Fuel CO2 and Potential for Biospheric Sequestration. Rice University/Shell Internal Symposium, Oct 6, 2006.

11. C.A. Masiello, Tracking the Earth’s Carbon Cycle. Rice Board of Trustees, May 23, 2007.

12. E. Mayorga, A.K. Aufdenkampe, C.A. Masiello, A.V. Krusche, P.D. Quay, J.E. Richey, S. Seitzinger. Rejuvenation and Aging of Carbon in Rivers: Sources, Exports, and Interactions Among Fractions in the Amazon and Other Systems, Fall American Geophysical Union Meeting, San Francisco, Dec. 12-17, 2007.

13. C.A. Masiello. Towards Soil and Sediment Inventories of Black Carbon. Fall American Geophysical Union Meeting, San Francisco, Dec. 15-19, 2008.

14. C.A. Masiello. Biogeochemistry of Charcoal in the Environment: Carbon cycle roles and carbon sequestration options. University of Texas Bureau of Economic Geology, March 26, 2009.

15. C.A. Masiello. Biogeochemistry of Charcoal in the Environment: Carbon Cycle Roles and Carbon Sequestration Options. Arizona State University School of Earth and Space Exploration, March 26, 2009.

16. C.A. Masiello, *W.C. Hockaday, M. Dean*. Using NMR to Understand the Ecological Roles of Charcoal. Soil Ecological Society Meeting, Burlington, VT, July 2009.

17. C.A. Masiello, *W.C. Hockaday, M.E. Gallagher.* Basic Solid-State NMR Techniques in the Biogeosciences. Ecological Society of America Meeting, Albuquerque, NM, August 2009.

18. C.A. Masiello. The Role of Charcoal in Carbon Sequestration and Greenhouse Gas Management. International Briquetting and Agglomeration Society. San Antonio, TX, October 2009.

19. C.A. Masiello. Effects of Human Activity on the Sources and Cycling of Carbon in U.S. Subtropical Rivers. Invited seminar, University of Houston Department of Earth and Atmospheric Sciences, October 23, 2010.

20. C.A. Masiello. Effects of Human Activity on the Sources and Cycling of Carbon in U.S. Subtropical Rivers. Invited seminar, Texas A&M University Department of Oceanography, April 19, 2010.

21. C.A. Masiello, T.J. Pérez. Two Modes of Human River Pollution: Comparing U.S. and Latin American Watershed Nutrient Contamination. Rice University Symposium: the City and the Environment in Latin America: An Interdisciplinary Perspective. Houston, TX, January 2011.

22. C.A. Masiello. Connecting Aerosol Measurements to the Global Black Carbon Cycle. Invited speaker, Aerosol Metrology for Climate Workshop, NIST, Gaithersburg, MD, March 2011.

23. C.A. Masiello. Ecosystem Oxidative Ratios in the Global Carbon Cycle. Invited seminar, Texas A&M University Ecology and Evolutionary Biology Program, April 2011.

24. C.A. Masiello. Carbon Oxidation and Reduction in the Earth System. Yale University Symposium: Frontiers in Earth Surface System Interactions. New Haven, CT, May 2011.

25. C.A. Masiello. Carbon Oxidation and Reduction in the Earth System. St. Andrews University School of Geography and Geoscience, St. Andrews, Scotland, May 2011.

26. C.A. Masiello. Grand Challenges in Earth System Science for the 21st Century, UC Irvine Earth System Science 20th Anniversary Celebration, Irvine, California, Sept. 2011.

27. C.A. Masiello. Charcoal in the Earth System. Baylor University department of Geology, Oct. 2011.

28. C.A. Masiello. Charcoal in the Earth System. Michigan State University department of Geological Sciences, Oct. 2011.

29. C.A. Masiello, M.E. Gallagher, W.C. Hockaday. Biochemical Yields in Biofuels Measured Through NMR and NIR. USDA Sustainable Bioenergy and Bioproducts Principal Investigators Meeting, Oct 2011.

30. C.A. Masiello. Charcoal in the Earth System. Virginia Commonwealth University department of Biology, Nov. 2011.

31. C.A. Masiello. Charcoal in the Earth System. Tulane University department of Earth and Environmental Sciences, January 2012.

32. C.A. Masiello. Charcoal in the Earth System. Arizona State University School of Earth and Space Exploration, Spring semester 2012.

33. C.A. Masiello, Z. Liu, K. Ziegelgruber, B. Dugan, H. Gonnermann, V. Chuang, K. Zygourakis Density and porosity as controls on charcoal storage in soils. European Geosciences Union, Vienna, Austria, April 2012.

34. C.A. Masiello, B. Dugan, K. Zygourakis, H. Gonnermann, Z. Liu, K. Ziegelgruber, V. Chuang Physical controls on organic matter stability. *Keynote*, European Geosciences Union, Vienna, Austria, April 2012.

35. M. Schneider, W.C. Hockaday, C. Masiello, M. Schmidt. A ‘molecular thermometer’ to estimate the formation temperature of wildfire charcoals. Eurosoil, Bari, Italy, July 2012.

36. T. Pérez, A. Giuliante, R.J. Rasse, J.C. Hernandez, L. Donoso, C.A. Masiello. Dissolved Inorganic Nitrogen (DIN) exports from 4 Venezuelan rivers: Urbanization and agriculture impact on nitrogen delivery to the Cariaco Basin and Coastal areas. GEOTRACES Latin American Workshop, Rio de Janiero, Brazil, November 2012.

37. C.A. Masiello, C.E. Brewer, B. Dugan, H. Gonnermann, K. Zygourakis, X. Gao, C.A. Davies, P. Panzacchi. Charcoal Chemistry: Irrelevant to Environmental Residence Time? ACS National Meeting, Indianapolis, September 2013.

38. A. Giuliante, T. Perez, J.C. Hernandez, C.A. Masiello, R.T. Barnes, K. Ziegelgruber, W. C. Hockaday. Concentration and stable isotopes of dissolved and particulate organic carbon in four Venezuelan rivers: Identification of sources. 2012, Instituto Venezolano de Investigaciones Cientificas, Los Altos, Venezuela.

39. C.A. Masiello, The Carbon Oxidative Ratio of the Earth System: An Introduction to the Tracer. University of Alberta, Edmonton, Alberta, September 2013.

40. X.Gao, C. Masiello, M. Gallagher, W. Hockaday, Z. Valdez. Effect of Nitrogen Fertilization on Switchgrass Biochemistry and Soil Carbon Sequestration. American Chemical Society, Santa Clara, CA. October 2013.

41. C.A. Masiello, M.E. Gallagher, X. Gao, W.C. Hockaday. Measuring the Biochemical Inventory of Cropped Ecosystems Using NMR. American Association of Industrial Crops, Washington, DC, October 2013.

42. C.A. Masiello, P.J.J. Alvarez, A. Ballestero, M. Bennett, B. Dugan, H. Gonnermann, E. Siemann, J. Silberg, D. Wagner, K. Zygourakis, M. Gallagher, V. Huguet, S. Cheng, Z. Liu, L. Pyle, T. Moore. Charcoal in the Earth System: Biochar Applications in Carbon and Water Management. Texas A&M University, November 2013.

43. C.A. Masiello, P.J.J. Alvarez, A. Ballestero, M. Bennett, B. Dugan, H. Gonnermann, E. Siemann, J. Silberg, D. Wagner, K. Zygourakis. Charcoal in the Earth System: Biochar Applications in Carbon and Water Management. Iowa State University. November 2013.

44. C.A. Masiello. Real Possibilities and Tempered Expectations for Food, CO2, and Drought Management. Houston Arboretum and Nature Center/Bartlett Trees, Houston, TX. February 2014.

45. C.A. Masiello, C.E. Brewer, B. Dugan, H. Gonnermann, K. Zygourakis, X. Gao, C.A. Davies, P. Panzacchi. Charcoal physical properties are key to understanding environmental behavior. European Geosciences Union, Vienna, Austria, April 2014.

46. C.A. Masiello, X. Gao, B. Dugan, J.J. Silberg, K. Zygourakis, P.J.J. Alvarez. Biochar: From Laboratory Mechanisms Through the Greenhouse to Field Trials. American Geophysical Union, San Francisco, December 2014.

47. C.A. Masiello, Biochar, water, and microbes: tracking the mechanisms behind biochar’s environmental effects. U.C. Merced, April 2015.

48. C.A. Masiello, Biochar, water, and microbes: tracking the mechanisms behind biochar’s environmental effects. U.Bologna, May 2015.

49. C.A. Masiello, Biochar: real possibilities and tempered expectations for water, food, and CO2 management. Baker Institute Water and Energy Workshop: Understanding the Impacts and Trade-Offs to Facilitate Transitions. Rice University, May 2015.

50. C.A. Masiello, Synthetic biology tools to understand microbial behavior in soils: a biogeochemistry perspective. Michigan State University, 2016.

51. C.A. Masiello, Charcoal as a nonlinear driver in soil C and N cycles. Kellogg Biological Station, Hickory Corners, MI, 2016.

52. C.A. Masiello, Charcoal as a nonlinear driver in soil C and N cycles. department of Earth and Atmospheric Science, Georgia Tech, 2016.

53. C.A. Masiello, The biochar design cycle. Gordon Organic Geochemistry Conference, Galveston, TX, 2016.

54. C.A. Masiello, H.-Y. Cheng, X. Gao, J.J. Silberg. Pyrogenic organic matter can alter microbial communication. University of Zurich, 2016.

55. C.A. Masiello, Spies and bloggers: bringing synthetic biology tools into Earth System Science. U.C. Irvine department of Earth System Science, 2017.

**ADDITIONAL TALKS:** presenting authors underlined; Masiello *students/postdocs* in italics

1. C.A. Masiello, E.R.M. Druffel, and S. Griffin, Black carbon 14C in the Santa Monica basin: riverine delivery and sedimentary accumulation*.*  Ninth Annual Goldschmidt conference, Harvard University, Cambridge, MA, 1999.

2. C.A. Masiello, M. Torn, J. Southon, O.A. Chadwick, Effects of Mineralogy on the Storage Rates of Organic Carbon Classes Across a Soil Chronosequence. 17th International Radiocarbon Conference, Jerusalem, Israel, 2000.

3. S. Wakeham, J. Forrest, A. Biersmith, Y. Gelinas, C. Alexander, and C. Masiello, Aliphatic and Aromatic Hydrocarbons in Lake Washington Sediments – A 25-year retrospective. 20th International Meeting on Organic Geochemistry, Nancy, France, 10-14 Sept. 2001.

4. Schmidt M.W.I., C.A. Masiello, Ball W.P., Currie, L.A., Czimczik C.I., Gelinas Y., Glaser B., Kuhlbusch T.A.J., Prentice K.M., Skjemstad J.O., Smith D.M. Reference Materials for Organic Geochemical Studies of Black Carbon. 20th International Meeting on Organic Geochemistry, Nancy, France, Vol 2, 97-98, 10-14 Sept. 2001.

5. K.K.Treseder, C.A. Masiello, Lansing, J., Allen M.F. Isotopic and Genetic Assessments of Ectomycorrhizal Turnover Under N-fertilization. Ecology Society of America Spring Meeting, 2001.

6. J.T. Randerson,, C.A. Masiello, Still, C.J., Rahn, T., Field, C.B. Is the Oxidative Ratio of the Terrestrial Biosphere Changing? Implications for Trends in Atmospheric O2. Ecological Society of America Spring Meeting, 2004.

7. C.A. Masiello, Baldock, J.A. Randerson, J.T., O.A. Chadwick, R.J. Smernik, *R.M. Deco*, J.W. Harden, M.C. Mack. The Natural Range in Oxidative Ratio of Environmental Organic Matter. American Chemical Society Meeting, San Diego, March 17, 2005.

8. C.A. Masiello, Czimczik, C. Resolving the Refractory-Labile Black Carbon Paradox: BC dynamics in soils. Fall American Geophysical Union Meeting, San Francisco, Dec 10-15, 2006.

9. C.A. Masiello, *Calligan, L.J., Gallagher, M.E. Hockaday, W.C.* Natural Variation in the Carbon Oxidation State and Oxidative Ratio of a Deciduous Forest, Fall American Geophysical Union Meeting, San Francisco, Dec. 12-17, 2007.

10. *M.E. Gallagher*, *W. C. Hockaday,* C.A. Masiello, C.P. McSwiney, G.P. Robertson, J.A. Baldock, Plant Biochemical Shifts Under Varying Nitrogen Conditions: Implications for the Carbon Cycle. 38th Biological Systems Simulation Meeting, Temple, TX. April 8-9, 2008.

11. *F.W. Zeng* and C.A. Masiello, Impacts of Urbanization on the Amount and Sources of CO2 Evaded from Subtropical Rivers, Texas Bays and Estuaries Meeting, Port Aransas, TX, April 16-17, 2008.

12. *M.E. Gallagher*, *W.C. Hockaday*, C.A. Masiello, C.P. McSwiney, G.P. Robertson, J.A. Baldock Nitrogen Fertilization of Corn: Plant Biochemistry Effects and Carbon Cycle Implications, Spring American Geophysical Union Meeting, Fort Lauderdale, May 27-30, 2008.

13. *H. Sun, W.C. Hockaday,* C.A. Masiello, K. Zygourakis. Physical and Chemical Structure Analysis of Biochars Produced from Different Feedstocks and Under a Variety of Pyrolysis Conditions. American Institute of Chemical Engineers Annual Meeting (AIChE), Salt Lake City, Nov 7-12, 2010.

14. M.P.W. Schneider, C.A. Masiello, M.W.I. Schmidt. Can Molecular Markers for Pyrogenic Carbon Help to Reconstruct Wildfire Temperatures? European Geosciences Union Meeting 2011, Vienna, Austria, April 2011.

15. C.A. Masiello, B. Dugan, K.Zygourakis, *W.C. Hockaday, T.J. Kinney, M.R. Dean, R.T. Barnes*. Assessing Controls on the Hydrologic Behavior of Biochars. 3rd Annual Biochar conference, UK Biochar Centre, Edinburgh, UK. May 2011.

16. C.A. Masiello, *M.E. Gallagher*, W.C. Hockaday. Making and Interpreting High Precision Ecosystem Oxidative Ratio Measurements. Ecological Society of America Meeting, August 2011, San Antonio, TX.

17. *M.E. Gallagher,* C.A. Masiello, *W.C. Hockaday*, S. Snapp, C.P. McSwiney, and J.A. Baldock. Estimating Oxidative Ratio in U.S. Agricultural Ecosystems. Ecological Society of America Meeting, August 2011, San Antonio, TX.

18. W.C. Hockaday, *M.E. Gallagher*, C.A. Masiello, *L.A. Pyle*, W.H. Polley, J.A. Baldock. Biochemical inventories as a tool to assay ecosystem carbon dynamics. Ecological Society of America Meeting, August 2011, San Antonio, TX.

19. *M.E. Gallagher, W.C. Hockaday*, C.A. Masiello, J.A. Baldock, S. Snapp, C.P. McSwiney. Using 13C Nuclear Magnetic Resonance Spectroscopy to Estimate Biochemical Stocks and Biofuel Feedstock Quality. ASA-CSSA-SSSA Annual International Meeting: San Antonio, TX, October 2011.

20. *H. Sun, W.C. Hockaday,* C.A. Masiello, K. Zygourakis. Soil Amendment by Biochar: Theoretical and Experimental Studies on the Dynamic Adsorption of Ammonium Nitrate in Soil/Biochar Mixtures. AIChE Annual Meeting, Minneapolis, MN. October 16-21, 2011.

21. J.J. Silberg, C.A. Masiello, S. Liu, J.A. Rudgers, M. Bennett, K. Zygourakis. Biochar effects on microbial cell-cell communication. US Bichar Conference, Sonoma State University, Rohnert Park, CA. July 2012

22. *H. Sun,* C.A. Masiello, K. Zygourakis. Characterizing the Pore Structure of Biochars: An New Approach Based on Multiscale Pore Structure Models and Reactivity Measurements. AIChE Annual Meeting, Minneapolis, MN. October 16-21, 2011.

23. T. Pérez, C.A. Masiello, *A. Giuliante*, R. Rasse, W.C. Hockaday, J.C. Hernandez, *R.T. Barnes*, L. Donoso. River nitrogen and carbon content and export from four rivers across different land uses and intensity in Venezuela: characterizing developing world anthropogenic watersheds fingerprints. Planet Under Pressure, London, UK, 2012.

24. M.E. Gallagher, W.C. Hockaday, C.A. Masiello, Z.P. Valdez, and X. Gao. The Effects of N Fertilization and Harvest Frequency on Switchgrass Feedstock Quality for Cellulosic Ethanol, USDA Biofuels PI annual Meeting, ASA-CSSA-SSSA Annual International Meeting: Cincinnati, OH, October 2012.

25. H. Sun, C.A. Masiello, K. Zygourakis. Transient multicomponent models for simulating water and nutrient flow through soils amended with biochar. Pittsburgh, PA, November 2012

26. X. Gao, C.A. Masiello, M.E. Gallagher, W.C. Hockaday, Z. Valdez. Effect of Nitrogen Fertilizer on Biofuel Crop Biochemistry and Soil Carbon Sequestration. ACS National Meeting, New Orleans, April 2013.

27. J.J. Silberg, C.A. Masiello, Y. Chen, X. Gao, S. Liu, H.-Y. Cheng, M.R. Bennett, J.A. Rudgers, D.S. Wagner, K. Zygourakis. Pyrolysis Temperature Determines Biochar Effects on Microbial Communication on the Timescale of Growth and Signaling. North American Biochar Symposium, Amherst, MA, October 2013.

28. C.E. Brewer, A. Woda, L.A. Driver, J. Burger, H. Gonnermann, C.A. Masiello. Biochar from Wastewater Biosolids – A Comparison to Biochars from Lignocellulose. AIChE Annual Meeting, November 2013.

29. C. Santin, S. Doerr, A. Merino, L. Driver, H. Gonnermann, C. Masiello. What is the difference between pyrogenic carbon from natural and artificial sources? A case study form the boreal forest. ESF-Exploratory Workshop. Seville, Spain. November 2013.

30. G. Clay, C.A. Masiello, F. Worrall. Controls on the formation, transport and fate of charcoal following moorland wildfires. EGU General Assembly. Vienna, Austria. April 2014.

31. C.A. Masiello, *C.E. Brewer*, B. Dugan, H. Gonnermann, K. Zygourakis, X. Gao, C.A. Davies, P. Panzacchi. Charcoal physical properties are key to understanding environmental behavior. European Geosciences Union, Vienna, Austria, April 2014.

32. W.C. Hockaday, *M. Gallagher*, C. Masiello, W. Polley, C. Iversen, R. Norby. Molecular (proxy) estimates of changes in soil organic matter stability with changes in atmospheric CO2 concentrations. Goldschmidt, Sacramento, CA, June 2014.

33. P.J. Hatton, K. Dastmalchi, S. Chatterjee, T. Filley, A. Plante, X. Gao, C.A. Masiello, K. Nadelhoffer, R. Stark, J.A. Bird. Linking charring temperature and wood source to PyOM structure. The Sixth International Workshopon Soil and Sedimentary Organic Matter Stabilization and Destabilization (SOM6), Kiawah Island, SC, September, 2014.

34. *L.A. Pyle*, W.C. Hockaday, T. Boutton, K. Zygourakis, *T.J. Kinney*, C.A. Masiello. Chemical and isotopic Thresholds in charring: implications for the interpretation of charcoal mass and isotopic data. Fall AGU, San Francisco, CA. December 2014.

35. J.J. Silberg, H.-Y. Cheng, C.A. Masiello. Gas biosensors for biogeochemistry: beyond GFP in E. coli. European Geosciences Union, April 2016, Vienna, Austria.

36. C.A. Masiello, H.-Y. Cheng, X. Gao, J.J. Silberg. Pyrogenic organic matter can alter microbial communication. European Geosciences Union, April 2016, Vienna, Austria.

37. L.A. Pyle, C.A. Masiello, K.L. Clark. Increased fire frequency optimization of black carbon mixing and storage. European Geosciences Union, April 2016, Vienna, Austria.

38. Cheng, H.Y., Masiello, C.A, Bennett, G.N., and Silberg, J.J. (2016) Using a methyl halide transferase to report on microbial conjugation in a hard-to-image matrix (72nd Annual ACS Southwest Regional Meeting, Galveston, TX)

**CONFERENCE PROCEEDINGS (POSTERS)**

presenting authors underlined; Masiello *students/postdocs* in italics

1. L.A. Currie, B.A. Benner, Jr., R. Cary, E.R.M. Druffel, T.I. Eglinton, P.C. Hartmann, J.D. Kessler, D.B. Klinedinst, G.A. Klouda, J.V. Marolf, C.A. Masiello, A. Pearson, J.G. Quinn, C.M. Reddy, J.F. Slater, and S.A. Wise, Interlaboratory Data on Elemental and Isotopic Carbon in the Carbonaceous Particle Reference Material, NIST SRM 1649a. Gordon Research Conference on Organic Geochemistry, Plymouth, New Hampshire, 2000.

2. C.A. Masiello., M.W.I. Schmidt, W.P. Ball, L.A. Currie, J.O. Skjemstad, D.M. Smith Development of standards for organic geochemical studies of black carbon. Gordon Research Conference on Organic Geochemistry, Plymouth, New Hampshire, 2000.

3. C.A. Masiello, M. Torn, J. Southon, O.A. Chadwick, T. Pease, and S. Wakeham, Mineralogy and Carbon Storage Across a Soil Chronosequence. Fall AGU, San Francisco, Dec. 2000.

4. K.K. Treseder, Masiello, C.A., Lansing, J., and M.F. Allen The Use of Radiocarbon to Examine Turnover Under N Fertilization in a Major Microbial Group. Spring AGU, 2001.

5. C.A. Masiello, Chadwick, O.A., Torn, M. Soil Organic Radiocarbon and Mineralogy at Two Coastal California Sites. Fall AGU, December 2001.

6. A.F. Dickens, Y. Gélinas, C.A. Masiello, J.I. Hedges, Recycled Graphitic Carbon: Presence and Distribution off the Washington Coast. Fall AGU, December 2002, San Francisco.

7. C.A. Masiello, P.J. Reimer, J.W. Harden, J. Munster, S.P. Anderson, A.F. White, M.S. Schulz, Radiocarbon in an Integrated Approach to Understanding Controls on Soil Carbon Sequestration. Fall AGU, December 2002, San Francisco.

6. E. Mayorga, Aufdenkampe, A.K., Masiello, C.A., Quay, P.D., Hedges, J.I., Richey, J.E., Krusche, A.V., Llerena, C.A., Forsberg, B.R., Quintanilla, J., DIC Cycling From 14C And 13C Isotopes in Mountain and Lowland Rivers in the Amazon Basin. ASLO, Victoria, Canada, 2002.

7. A.F. Dickens, Yves Gélinas, C.A. Masiello and John I. Hedges. Recycled Graphitic Carbon: Presence and Distribution off the Washington Coast. INQUA, Nevada, July 2003.

8. C.A. Masiello, *Deco, R.M*., Randerson, J.T., Baldock, J.A., and Chadwick, O.A. Organic Carbon Oxidative State (Cox) and Oxidative Ratio (OR): Two New Parameters for Carbon Cycle Studies. Kearney Foundation Soil Carbon Storage Workshop, Davis, CA Sept. 2003.

9. J.A. Baldock, Masiello, C.A., *Deco, R.M*., Randerson, J.T., Chadwick, O.A., Estimating Elemental Composition and Oxidation State of Natural Organic Matter Using 13C NMR. Australian Organic Geochemistry/International Humic Substances Society joint meeting, Sydney, Australia, February 2004.

10. C.A. Masiello, Baldock, J.A., Smernik, R., Chadwick, O.A., Randerson, J.T. Oxidation State of Natural Organic Materials as an Organic Geochemical Tracer: Prospects for Measurement via 13C NMR. ACS National Meeting, Anaheim, CA March 2004.

11. C.A. Masiello, P.J. Reimer, O.A. Chadwick, J.W. Harden, J.S. Southon, M.S. Torn. Climate Drivers of Soil Carbon Storage Across the West Coast of California. 2nd International Conference on Mechanisms of Organic Matter Stabilization in Soils, Asilomar, California, Oct 9-13, 2005.

12. *M.E. Gallagher*, C.A. Masiello, J.T. Randerson, O.A. Chadwick, R.M. Deco. Accuracy and Precision in Measurements of Biomass Oxidative Ratios. 2005 Fall AGU, San Francisco.

12. *M.E. Gallagher.* C.A. Masiello, *N. Clark*, J.T. Randerson, G.P. Robertson. The Effects of Decomposition on the Oxidative Ratio and Carbon Oxidation State of Organic Matter. Fall American Geophysical Union Meeting, San Francisco, Dec 10-15, 2006.

13. *W.C. Hockaday*, C.A. Masiello, J.A. Baldock, R.J. Smernik, O.A. Chadwick. Progress in the Measurement of Organic Carbon Oxidation State (Cox) via 13C NMR. 3rd European Symposium on NMR Spectroscopy in Soil, Geo, and Environmental Sciences. Freising, Germany, 2006.

14. C.A. Masiello, *W.C. Hockaday, M.E. Gallagher,* J.T. Randerson, O.A. Chadwick, J.A. Baldock, R.J. Smernik, Tracking the Carbon Oxidation State and Oxidative Ratio of the Terrestrial Bioshere. North American Carbon Meeting, Colorado Springs, CO, January 2007.

15. *F.W. Zeng.*, C.A. Masiello. Effects of Urbanization on River CO2 Emissions, Fall American Geophysical Union Meeting, San Francisco, Dec. 12-17, 2007.

16. *W.C. Hockaday*, C.A. Masiello, J.A. Baldock, C.M. Iverson, R.J. Norby. Analysis of Changes in Biochemical Composition Under Free-Air CO2 Enrichment by 13C Nuclear Magnetic Resonance: Leaf Litter, Roots, and Soils from Oak Ridge, Fall American Geophysical Union Meeting, San Francisco, Dec. 12-17, 2007.

17. *M.E. Gallagher*, C.A. Masiello, J.T. Randerson, O.A. Chadwick, G.P. Robertson. Accuracy and Precision in Measurements of Biomass Oxidative Ratio and Carbon Oxidation State, Fall American Geophysical Union Meeting, San Francisco, Dec. 12-17, 2007.

18. *M.E. Gallagher*, C.A. Masiello, *W.C. Hockaday*, C.P. McSwiney, G.P. Robertson, J.A. Baldock Changes in Plant Biochemistry Under Varying Nitrogen Fertilization: Implications for the Soil Carbon Pools. Joint Meeting: Geological Society of America, Soil Science Society of America, American Society of Agronomy, Crop Sciences Society of America, Houston, October 5-9, 2008.

19. *M.L. Keller,* C.A. Masiello, B. Dugan, J.A. Rudgers, S.C. Capareda. Phytotoxicity and Plant Productivity Analysis of Tar-Enriched Biochars. Fall American Geophysical Union Meeting, San Francisco, Dec. 15-19, 2008.

20. *F. Zeng*, C.A. Masiello, *W.C. Hockaday*. Controls on the Origin and Cycling of Riverine Dissolved Inorganic Carbon in the Brazos River, Texas. Fall American Geophysical Union Meeting, San Francisco, Dec. 15-19, 2008.

21. *M.E. Gallagher,* C.A. Masiello, *W.C. Hockaday*, C.P. McSwiney, G.P. Robertson. The Effects of Nitrogen Fertilization of a Corn Ecosystem's Oxidative Ratio and Its Carbon Cycle Implications. Fall American Geophysical Union Meeting, San Francisco, Dec. 15-19, 2008.

22. *T.J. Kinney,* *W.C. Hockaday*, C.A. Masiello, B. Dugan, *M. Dean*. Engineering Biochar Hydrophobicity to Mitigate Risk of Top-soil Erosion. Fall American Geophysical Union Meeting, San Francisco, Dec, 14-18, 2009.

23. *F.-W. Zeng*, C.A. Masiello. Effects of Land Use and Lithology on the Origin and Cycling of Dissolved Inorganic Carbon in the Brazos River, Texas. Fall American Geophysical Union Meeting, San Francisco, Dec, 14-18, 2009.

24. C.A. Masiello, Interannual Variations in Ecosystem Oxidative Ratio in Croplands, Deciduous Forest, Coniferous Forest, and Early Successional Forest Ecosystems. Fall American Geophysical Union Meeting, San Francisco, Dec, 14-18, 2009.

25. *W.C. Hockaday*, C.A. Masiello, *M.E. Gallagher, L.J. Calligan*. The Effects of Land-Use Change on Ecosystem Oxidative Ratio. Fall American Geophysical Union Meeting, San Francisco, Dec, 14-18, 2009.

26. *M.E. Gallagher*, *W.C. Hockaday,* C.A. Masiello, S. Snapp, W, Polley, C.P. McSwiney, J. Baldock. The Potential Impacts of Nutrient and CO2 variations on Ecosystem Oxidative Ratio. Fall American Geophysical Union Meeting, San Francisco, Dec, 14-18, 2009.

27. *W.C. Hockaday*, Y.-S. Hwang, Q. Li, C.A. Masiello. Mass Spectrometric Evidence of Non-Colloidal Fullerenes in Waters Containing Natural Organic Matter. American Chemical Society National Meeting, San Francisco, March 21-25, 2010.

28. *W.C. Hockaday,* S. Kim, P.G. Hatcher, C.A. Masiello. Comparing the Molecular Structures of Black Carbon in Soil and Water to Constrain Processes of Formation and Decomposition. American Chemical Society National Meeting, San Francisco, March 21-25, 2010.

29. C.A. Masiello, *W.C. Hockaday,* K. Zygourakis, B. Dugan, J.A. Rudgers, P.J.J. Alvarez, T.W. Boutton, *L.A. Pyle, T.J. Kinney, H. Sun,* D. Li. Biochar Research at Rice University: An Overivew. Geological Society of America, Denver, CO, 2010.

30. C.A. Masiello, *M.E. Gallagher, W.C. Hockaday*. Global Carbon Reservoir Oxidative Ratios. Fall American Geophysical Union Meeting, San Francisco, Dec. 13-18, 2010.

31. *M.E. Gallagher, W.C. Hockaday,* C.A. Masiello, S. Snapp, C. McSwiney, J.A. Baldock. Biochemical Disincentives to Fertilizing Cellulosic Ethanol Crops. Fall American Geophysical Union Meeting, San Francisco, Dec. 13-18, 2010.

32. *L.A. Pyle, W.C. Hockaday, C.A. Masiello,* T.W. Boutton, *C. LeCroy.* Production and Isotopic Composition of Black Nitrogen Following Experimental Charring of Plant Materials. Fall American Geophysical Union Meeting, San Francisco, Dec. 13-18, 2010.

33. *W.C. Hockaday, M.E. Gallagher,* C.A. Masiello, *L.A. Pyle,* W.H. Polley, J.A. Baldock. The Response of Soil Carbon Stocks to Changing Atmospheric Carbon Dioxide Concentrations are Soil-Type-Dependent. Fall American Geophysical Union Meeting, San Francisco, Dec. 13-18, 2010.

34. *H. Sun, W.C. Hockaday,* C.A. Masiello, K. Zygourakis. Physical and Chemical Structure Analysis of Biochars Produced from Different Feedstocks and Under a Variety of Pyrolysis Conditions. American Institute of Chemical Engineers Annual Meeting (AiChE), Salt Lake City, Nov 7-12, 2010.

35. C.A. Masiello, *M.E. Gallagher*, W.C. Hockaday. Making and Interpreting High Precision Ecosystem Oxidative Ratio Measurements. North American Carbon Program (NACP) All-Investigators Meeting, New Orleans, LA, February 2011.

36. *M.E. Gallagher*, C.A. Masiello, W.C. Hockaday, S. Snapp, C.P. McSwiney, and J.A. Baldock. Variation in the Oxidative Ratio of US Agricultural Ecosystems from 1930 to 2010. North American Carbon Program (NACP) All-Investigators Meeting, New Orleans, LA, February 2011.

37. T.J. Pérez, C.A. Masiello, A. Giuliante, R. Rasse, W.C. Hockaday, J.C. Hernandez, R.T. Barnes, L. Donoso, A. Rojas. Two Modes of Carbon and Sediment Transport: Developed vs Developing World. 2011 Catchment Science Gordon Research Conference, July 9-15, 2011.

38. M. Schulz, C. Lawrence, D. Stonestrom, J.W. Harden, T. Bullen, A. White, J. Fitzpatrick, C.A. Masiello. Marine Terrace Soils Along the West Coast of North America: an Archive of Climate Control? 2011 Catchment Science Gordon Research Conference, July 9-15, 2011.

39. *F.-W. Zeng*, C.A. Masiello, *W.C. Hockaday*, J.A. Baldock. Sources and Cycling of Riverine Particulate Organic Matter Revealed by C Isotope, C/N, and NMR Analyses. 2011 Catchment Science Gordon Research Conference, July 9-15, 2011.

40. *R.T. Barnes*, *M.E. Gallagher*, C.A. Masiello, B. Dugan, *Z. Liu*, J.A. Rudgers. Changes in water, carbon, and nitrogen fluxes with the addition of biochar to soils:  lessons learned from laboratory and greenhouse experiments. AGU, San Francisco, CA. December 2011.

41. M. Schulz, C. Lawrence, D. Stonestrom, T. Bullen, J. Harden, A. White, J. Fitzpatrick, C.A. Masiello. Marine terrace soils along the west coast of North America: a weathering archive? Goldschmidt Conference, Montreal, Canada, June 2012.

42. Z.P. Valdez, W.C. Hockaday, *M.E. Gallgher*, C.A. Masiello, X. Gao. Effects of Nitrogen Fertilizer On Soil Organic Matter Pools Under Switchgrass Agricullture. Soil Society of America, San Diego, CA. April 2012.

43. C.A. Masiello, L. Driver, H. Gonnermann, B. Dugan, V. Chuang, Z. Liu, K. Zygourakis. Black Carbon: Does it Sink or Float? AGU/ASLO Ocean Sciences Meeting, Salt Lake City UT, February 2012.

44. C.A. Masiello, T. Perez, *A. Giuliante*, R.J. Rasse, W.C. Hockaday*, R.T. Barnes*, J. C. Hernandez, L. Donoso. Dissolved and particulate organic carbon exports from 4 Venezuelan rivers: Effects of developing world urbanization on coastal carbon delivery. AGU, San Francisco, CA. December 2012.

45. *A. Giuliante*, T.J. Pérez, J.C. Hernandez, C.A. Masiello, *R.T. Barnes,* W.C. Hockaday. Lignin Oxidation Products from Suspended Sediments of Four Venezuelan Tropical Rivers: Identification of Organic Matter Sources. Gordon Catchement Science Research Conference, May 2013.

46. C.A. Masiello, *C. Brewer*, B. Dugan, *Z. Liu*, H. Gonnermann, K. Zygourakis, C.A. Davies, P. Panzacchi, X. Gao, *L.A. Pyle*. Biochar Physical Properties are Key to Understanding Environmental Performance. Geological Society of America National Meeting, Denver, CO, October 2013.

47. J.J. Silberg, *H.-Y. Cheng*, C.A. Masiello. Using synthetic biology to examine biochar effects on microbial communication and carbon sequestration in soils. Synbio Conference, Manhattan Beach, CA. July 2014.

48. C.A. Masiello, *H.-Y. Cheng*, J.J. Silberg. Spies and Bloggers: new biosensors for soil microbiology. The Sixth International Workshopon Soil and Sedimentary Organic Matter Stabilization and Destabilization (SOM6), Kiawah Island, SC, September, 2014.

49. *Z. Liu*, B. Dugan, C.A. Masiello, H. Gonnermann. Grain-Size Effects on Field Capacity of Soil-Biochar Mixtures. Fall AGU, San Francisco, CA. December 2014.

50. J.J. Silberg, *H.-Y. Cheng*, C.A. Masiello. Improved Biosensors for Soils. Fall AGU, San Francisco, CA. December 2014.

51. C.A. Masiello, J.J. Silberg, X.Gao, H.-S. Cheng, M. Bennett, G. Bennett, S. Liu. Charcoal effects on soil microbial cell-cell communication: lab observations and potential ecosystem consequences. Biannual Soil Ecological Society Meeting, Colorado Springs, Colorado, June 2015.

52. J.J. Silberg, C.A. Masiello, H.-Y. Cheng, G. Bennett, M. Bennett. Using gas replacements for GFP to track microbial dynamics in hard-to-image soils and sediments. Gordon Geobiology Conference, 2016.

53. H.-Y. Cheng, J.J. Silberg, C.A. Masiello, G.N. Bennett. Dynamic monitoring of horizontal gene transfer in soil. Gordon Geobiology Conference, 2016.