

## CURRICULUM VITAE

### **M. Francesca Cotrufo, PhD**

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DOB: 3/29/68

### EDUCATION:

1991 *Laurea* in Biology, University of Naples, Italy (110/110 + laude)  
1995 Ph.D. Soil Ecology, Lancaster University/Institute of Terrestrial Ecology, UK

### POSITIONS HELD:

2008- date Full Professor, Dept. of Soil and Crop Sciences, Colorado State University, Fort Collins, CO, USA  
2008-date Senior Scientist, Natural Resource Ecology Laboratory, Colorado State University  
2006-2008 Full Professor, Dept. Environmental Sciences, Second University of Naples, Italy  
2000-2006 Assoc. Professor, Dept. of Environmental Sciences, Second University of Naples  
1994-2000 Research Scientist, Dept. of Environmental Sciences, Second University of Naples

### RESEARCH INTERESTS

*I am a soil ecologist with leading experience in the field of litter decomposition and soil organic matter C and N dynamics, and in the use of isotopic methodologies in these studies. My main research interest is in the understanding of C and N fluxes from plant or pyrogenic organic matter to soil, water and the atmosphere, and their response and feedback to global environmental changes. I also pursue applied research to propose soil management practices that increase soil quality and fertility and mitigate climate change, as for example the study of biochar in soils. As a scientist fully aware of the current and future challenges expecting humanity, I am interested in promoting research education, and outreach activities to help mitigating the current human impacts on the Earth System and assure a better sustainable path for humanity.*

### RESEARCH PROJECTS:

2017-2010: NSFDEB-NERC: Mycorrhizal drivers of SOM formation and decomposition (NSF PI, \$499,000).  
2017-2020: Root genetics in the field to promote drought adaptation and carbon sequestration, ARPA-E, DOE (coPI \$6,500,000).  
2017: Partitioning of soil organic carbon into a coarse and a fine fraction in a subset of LUCAS soil samples, European Commission (PI: € 14,950).  
2016-2019: Quantifying the Mechanisms of Soil C Sequestration and Loss in Agroecosystems. USDA-ARS-Agricultural Research Service (PI, \$42,680).  
2016 : Quantification of pyrogenic carbon in the EU LUCAS soil samples, European Commission (PI: € 14,592).  
2016: Study of the effects of engineered biocarbon and microbial amendments on maize production under full and limited irrigation (PI: \$ 19,880).  
2015-2018: Measurement and Modeling of Soil C Storage and Greenhouse Gas Emissions from Southern Pine Biofuel Feedstocks, Shell (co-PI: \$620,955)  
2015-2017: Toward a reduction in the environmental impacts of energy production from slash pine: Understanding potential for soil C sequestration and mitigation of greenhouse gas emissions, CSU-Shell (PI, \$160,000)  
2014-2015: US-Switzerland-Australia Site Visits: Expanding and Advancing Black Carbon Research through new International Collaborations, NSF-CNIC (PI, \$50,000).

- 2014-2019: Biofuel Feedstocks from Beetle-Killed Wood: Bioenergy Alliance Network of the Rockies (BANR), USDA-NIFA (Co-PI; \$9,850,000)
- 2014-2015: Developing scholarly excellence across the aquatic-terrestrial interface: Understanding the hydro-bio-geo-chemistry of extreme events, CSU Water Center (Co-PI; \$24,982).
- 2013-2016: Understanding litter input controls on soil organic matter turnover and formation are essential for improving carbon-climate feedback predictions for Arctic, tundra ecosystems, DOE (co\_PI; \$898,997)
- 2013-2015: “Critical need for continued growth & expansion of the EcoCore Analytical Facility”. CSU VPR (Co-PI; \$66,368).
- 2013-2016: Decision Support Tools, Drought Tolerance, and Innovative Soil and Water Management Strategies to Adapt Semi-arid Irrigated Cropping Systems to Drought, USDA-CIG (CSU-PI; \$880,000)
- 2012-2013: “Full accounting of pyrogenic-C dynamics at the watershed scale: a unique opportunity offered by the High Park Fire”, NSF (PI; \$197,000)
- 2012-2013: Research Experience for Undergraduate, NSF (PI; \$7,500).
- 2012-2013: Research Experience for Teachers, NSF (PI; \$15,000).
- 2011-2014: “Soils, Land Use and Climate Change: a new Baccalaureate concentration”. USDA-NIFA-HEC (PI, \$174,617).
- 2011-2013: “EcoCore: Rebranding and Refurbishing the Natural Resource Ecology Analytical Laboratory to Address an Evolving Mission”. CSU VPR (Co-PI; \$179,102).
- 2011-2012: “Biochar for the Colorado agricultural industry: a research assessment of energy, economic and environmental benefits. 2011 Advancing Colorado’s Renewable Energy Grant Program, Colorado Department of Agriculture (PI; \$49,909).
- 2011-2012: Research Experience for Undergraduate, NSF (PI; \$7,500).
- 2011-2012: Research Experience for Teachers, NSF (PI; \$15,000).
- 2010-2011: “Women, Population and the Environment” – Global Challenge Research Team, School for the Global Environment and Sustainability, Colorado State University (PI; \$14,600).
- 2010-2011: “Biochar: an assessment of potential energy, environmental and economic benefits”. CSU – Green Energy Supercluster internal seed grant (PI; \$20,000).
- 2010-2011: Research Experience for Teachers, NSF (PI; \$15,000).
- 2009-2013: “A novel experimental and modeling study of C and N dynamics between litter, soil and the atmosphere as affected by soil fauna and litter quality” (Bluestem) NSF (PI; \$798,491).
- 2010-2011: “Summer Soil Institute: Addressing Environmental Changes and Emerging Techniques from Microbial to Global Scales”. USDA CSREES AFRI (Co-PI; \$149,859)
- 2009-2010: “Salt Cedar and Russian Olive Demonstration Act (HR2720) Science Assessment and Ongoing Invasive Species-related Research Projects” (Tamarisk). Forest Service USDA (PI; \$123,500)
- 2008-2010 “Impatto della conversione di agroecosistemi da seat-aside a coltivazione per biocarburanti sul carbonio organico del suolo e sulle emissioni di gas ad effetto serra”. PRIN-MIUR (CoPI; € 42,000).
- 2006-2011: NITROEUROPE IP, European Community VII Framework program, [www.nitroeuropa.eu](http://www.nitroeuropa.eu) (Steering Committee Member, Activity Leader, PI; €247,000)
- 2006-2009: CARBOITALY, FISR Italian Ministry of University and Research -MIUR (Unit coordinator, PI; € 520,100)
- 2007: “Carbon isotope tracing in forest ecosystems”. Galileo 2007 Italy-France exchange program (Responsible for the Italian team; €8,500).
- 2005-2007: “Advanced laser techniques to investigate carbon isotope discrimination during decomposition”, ToK Marie Curie Project, European Community VII Framework (Coordinator; €107,882).
- 2004-2009: CARBOEUROPE IP, European Community VII Framework program, [www.carboeuropa.org](http://www.carboeuropa.org) (Internal Advisory Board Member, PI; €70,000)
- 2004-2006: “Conventional and accelerator mass spectrometry in archaeometry and environmental sciences”, Italian Ministry of University and Research, MIUR\_PRIN (Co\_PI; €30,000)
- 2003-2006: “An integrated European scientific infrastructure for global change studies on forest and

- agroforest ecosystems utilizing FACE Technology- EUROFACE”, European Community VI Framework program, [www.unitus.it/euroface/](http://www.unitus.it/euroface/) (Coordinator of the Work Package 8: Determinants of C losses and decomposition, PI; €72,000).
- 2003-2006: “Mediterranean ecosystems under increasing drought- MIND”, European Community VI Framework program, (Coordinator of the Work Package 3: Soil C fluxes, Co\_PI; €70,000).
- 2003-2006: “Novel physics methodology in ecological research”- International PhD course program, MIUR (Coordinator; €57,000).
- 2003-2005: “Implementation and use of an innovative isotope methodology for the quantification of C fluxes and stores in soils”. Project funded by the Assessorato alla Ricerca Scientifica della Regione Campania, Legge 5 (Coordinator; €38,700).
- 2002-2004: “Development and application of isotopic methodologies in environmental research - DAIMER”, ToK Marie Curie Project, European Community V Framework (Co\_PI; €50,000).
- 2001-2006: “Carbon Storage in European Grasslands”, European Community COST Action 627 (Coordinator of WP1: “Plant, soil and soil organisms”, Italian Delegate).
- 2001-2004: “Development and application of isotopic methodologies to environmental science research”- International PhD course program, MIUR (Coordinator, €38,218)
- 2000-2003: “Forest carbon-nitrogen trajectories: FORCAST”, European Community V Framework (PI; €136,070).
- 2000-2008: PIANOSALAB project (LTER and Fluxnet Italian site), National Research Council (Steering committee member, PI).
- 1998-2001: “A FACE experiment on a short rotation poplar plantation – POPFACE”, European Community IV Framework (Investigator)
- 1996-1999: “Carbon and Nitrogen interactions in Forest ecosystems – CANIF”, European Community IV Framework (Investigator)
- 1995-1998: SAVAFLUX, European Community IV Framework (Co-PI)
- 1994-1997: MEGARICH, European Community IV Framework (Investigator)

#### RESEARCH FELLOWSHIPS & INTERNATIONAL COLLABORATIONS:

- 2015: OECD Research Fellow and visiting scientist at the Joint Research Center of the European Union.
- 2012 to date: Research Collaboration with Prof. Peter Grace, Brisbane University Australia, on the CFF project.
- 2009 to date: Research Collaboration with Profs. Ivan Jansen and Reinhart Ceulemans, University of Antwerpen (Belgium) on the inpair-P project and other projects.
- 2008 to date: Research collaboration with Dr. Sebastien Fontaine, INRA (Clermont-Ferrand, France) on a research project for the study of priming effects in different soil organic matter fractions of world soils.
- 2008: Research collaboration with Dr. Jerome Ngao, INRA (Clermont-Ferrand, France) on a research project for the study of isotopic discrimination and litter chemistry changes during litter decomposition.
- 2005: Short term Research visit at Oak Ridge National Laboratory and at the University of Duke to conduct a dendroecology study at the forest FACE facilities.
- 2004 and 2005: Short term Research visits at the Dept. of Biology University of Illinois, Urbana, upon invitation of Prof. Steve Long, to advise on soil studies conducted at the SoyFACE.
- 2000: Short term Research visit at the Dept. of Biology, University of San Diego, upon invitation of Prof. Walter Oechel, to conduct soil study at the Open Top Chamber facility of Sky Oak, CA.
- 1998: Smithsonian Institution Research fellowship for a three months research visit at the Smithsonian Environmental Research Centre. During this period, field work was conducted at the FACE facilities at Oak Ridge National Laboratory, at Duke University and at the Smithsonian field station at the Kennedy Space Centre, NASA. Isotope analyses were performed at the Isotope Laboratory, Utah University.
- 1996: EU COST Action 619 Research Fellowship for a one month research visit at AB-DLO, Wageningen, NL
- 1995: European Environmental Research Organization Research Fellowship for a three months research visit at AB-DLO, Wageningen, NL.
- 1994-95: British Council Research Fellowship to conduct research at ITE Merlewood, UK.

#### TEACHING/EDUCATION:

## Courses

*Course leader* (Colorado State University, Dept. of Soil and Crop Sciences)

SOCR670\_Terrestrial Ecosystems Isotope Ecology - spring semester even years

SOCR400\_Soil and Global Change: Science and Impacts – fall semester

Seminar: “Litter decomposition: re-considering paradigms and methods”, ECOL592- Fall 2011

*Co-Instructor* (Colorado State University, Dept. of Soil and Crop Sciences)

SOCR530\_Scientific Writing – spring semester.

## Summer Schools

Instructor for the module on “Soil Organic Matter dynamics and stable isotopes” in the: Summer Soil Institute: Addressing Environmental Challenges with Current and Emerging Techniques from Microbial to Global Scales, <http://soil institute.nrel.colostate.edu/index.html>, CSU, every summer.

## Classes taught

*Course leader* (Second University of Naples)

Undergraduate course: “Applied Ecology”, spring semester (every year), Dept. of Environmental Sciences.

II level degree course “Global Environmental Changes”, Fall semester (every year), Dept. of Environmental Sciences.

II level degree course “Conservation Biology”, Fall semester (every year), Dept. of Environmental Sciences.

Graduate course “Biogeochemical Cycles”, flexible (every other year), Dept. of Environmental Sciences.

Graduate series of seminars on “Technique of presentation of scientific results”, flexible (every other year), Dept. of Environmental Sciences.

*Guest lecturer*

2014: In the course: “Ecosystem Ecology”, NR 601, Colorado State University

2013 to date: In the course: “Bioenergy”, AGRI/ENGR 601, CSU

2012 to date: In the course: “SUPER: Skills for Undergraduate Participation in Ecological Research”, CSU

2011 to date: In the course: “Ecosystem Ecology”, RS 351, Colorado State University

2008 to date: In the course: “Soil-Plant-nutrient relationships”, Colorado State University

2010 to 2013: In the course: “Global Change Ecology, Impacts and Mitigation”, Colorado State University

2001: Course: “Global Change and Water Resources in the Mediterranean Region”, University of Castilla-La Mancha, Toledo (Spain), RICAMARE project course.

*Commissioned Courses*

2011: “Energy Policies Toward a Better World--the U.S. and the EU.” For the course “Colorado Council for Economic Education” (CCEE), Denver, CO.

2005: “Environment and Environmental matrices” for the professional course on *Tecnico Superiore Ambiente, Energia e Sicurezza (in azienda)*, P.O.R. Campania Region.

2000: “Ecology” for the High qualification course on *Esperto del trasferimento di tecnologie per la tutela e valorizzazione dei beni Ambientali*, Ministry of University and Research

1999- “Ecology” for a professional course on: *Responsabile del sistema di gestione ambientale*.

## Invited Seminars

- Accademia dei Gergofili, Firenze (I)
- AB-DLO at Arhem and at Wageningen (NL)
- Biogeochemistry and Environmental Science and Sustainability Program, Cornell University (USA)
- Dept. of Biological Sciences dell’Università di Lancaster (UK)
- Dept. of Biology, University of Antwerp (NL)
- Dept. of Biology, University of Illinois, Urbana (USA)
- Dept. of Biology, University of Milan Bicocca (IT)

- Dept. of Biology, University of Utah, Salt Lake City (USA)
- Dept. of Forest & Rangeland Stewardship, Colorado State University (USA)
- Dept. of Earth System Science, University of California, Irvine (USA)
- Dept. of Soil Science and Biogeochemistry, University of Zurich (CH)
- Dept. of Soil & Crop Sciences, Colorado State University (USA)
- DISAFRI, University of Tuscia, Viterbo (IT)
- ETH, Zurich (CH)
- Faculty of Natural Sciences, University of Bologna (IT)
- Institute of Terrestrial Ecology, NERC, Grange-o-Sands (UK)
- Oak Ridge National Laboratory, Tennessee (USA)
- NREL, Colorado State University (USA)
- Soil Science Unit, Technical University of Munich (D)
- Smithsonian Environmental Research Centre, Maryland, (USA)

## **Graduate student program**

### *Coordinator*

- 2003-06: International PhD course in “Novel Physics Methodologies for Ecological Research”. Financed by the Italian Ministry of University and Research (MIUR), in collaboration with the University of Bochum (Germany), the University of York (UK), the University of Udine (Italy) and the International Center for Theoretic Physics, Trieste (Italy).
- 2001-04: International PhD course in “Isotope Methodologies for Environmental Science Research”. Financed by the Italian Ministry of University and Research (MIUR), in collaboration with the University of Bochum (Germany), the University of York (UK), the University of Udine (Italy), CNR\_IAS, Porano (Italy).

### *Graduate Student Advisor*

- 2017-date: Sarah Leichty (MS), Graduate Degree Program in Ecology, Colorado State University
- 2017-date: Katherine Rocci (MS), Graduate Degree Program in Ecology, Colorado State University
- 2016-date: Bethany Avera (PhD), Graduate Degree Program in Ecology, Colorado State University
- 2016-date: Samantha Moser (PhD), Graduate Degree Program in Ecology, Colorado State University
- 2014-date: Matt Ramlow (PhD), Graduate Degree Program in Ecology, Colorado State University
- 2014-date: Yamina Pressler (PhD co-advisor), Graduate Degree Program in Ecology, CSU
- 2013-date: Sarah Fulton-Smith (PhD), Soil and Crop Sciences, Colorado State University
- 2013-date: Erica Foster (MS), Graduate Degree Program in Ecology, Colorado State University
- 2011-2014: Andrew J. Horton, (MS), Graduate Degree Program in Ecology, Colorado State University
- 2009-2014: Jennifer Soong (PhD), Graduate Degree Program in Ecology, Colorado State University
- 2006-2010 Andrea Veturi (PhD), International Graduate Degree Program in “Novel physics methodology in ecological research”, Second University of Naples
- 2003-06 Daniela Piermatteo (PhD). International Graduate Degree Program in “Novel physics methodology in ecological research”, Second University of Naples
- 2003-06 Fabio Marzaioli (PhD), International Graduate Degree Program in “Novel physics methodology in ecological research”, Second University of Naples (Co-Advisor)
- 2002-05 Ilaria Inglima (PhD), International Graduate Degree Program in “Implementation and application of isotopic methodology in environmental sciences research”, Second University of Naples
- 2002-05 Mauro Rubino (PhD), International Graduate Degree Program in “Implementation and application of isotopic methodology in environmental sciences research”, Second University of Naples (Co-Advisor)
- 2001-04 Ilaria Del Galdo (PhD), International Graduate Degree Program in “Implementation and application of isotopic methodology in environmental sciences research”, Second University of Naples
- 2001-04 Giovanna Battipaglia (PhD), International Graduate Degree Program in “Implementation and application of isotopic methodology in environmental sciences research”, Second University of Naples
- 1999-2002 Raffaele A. De Pascale (PhD), Graduate Degree Program in “Ecology” Univ. of Naples

### *Member*

2015 to date Faculty of the CSU School of Global Environmental Sustainability (SoGES)  
2014 to date Faculty of the CSU Water Center  
2011-to 2014 Faculty of the NSF IGERT MAS BioEnergy Program  
2010 to date Faculty and member of the organizing committee of the Summer Soil Institute  
2008-to date Faculty of the Graduate Degree Program in Ecology, Colorado State University  
2006 to 2008 Faculty of the International PhD course in Novel Physics Methodologies for Environmental Research, Second University of Naples, Italy

### *Graduate Student Committees*

2015 External Examiner for Huda Alghanasi's PhD dissertation, University Putra Malaysia  
2013-to-date Doctoral Committee Member for Laurel Linch , GDPE, CSU  
2013-2017 Doctoral Committee Member for Phasita Toonsiri, Soil and Crop Sciences, CSU  
2013-2014 Master Committee Member for Drew Bingham, GDPE, CSU  
2013-to-date Doctoral Committee Member for Charlotte Alster , GDPE, CSU  
2013 External Examiner for N. Singh's PhD dissertation, University of Zurich  
2012-to-date Doctoral Committee Member for Trung Nguyen, Soil and Crop Sciences, CSU  
2012-2015 Doctoral Committee Member for Jennifer Rocca , GDPE, CSU  
2012-2014 Doctoral Committee Member for Suzanne Brant , Dept. of Anthropology, CSU  
2012-2013 Doctoral Committee Member for Carolyn Hoagland, Soil and Crop Sciences, CSU  
2011-2015 Doctoral Committee Member for Nell Campbell, IGERT Biofuel & GDPE, CSU  
2010- 2016 Doctoral Committee Member for Paul Brewer, Dept. of Biology, CSU  
2010- 2015 Doctoral Committee Member for Jocelyn Lavalley, GDPE, CSU  
2010- 2014 Doctoral Committee Member for Mohamed Abulobaida, Soil and Crop Sciences, CSU  
2009- 2013 Doctoral Committee Member for Zachary Sylvain, Dept. of Biology, CSU  
2010-2012 Master Committee Member for Ashley , Biology, CSU  
2010- 2012 Master Committee Member for Brooke Osborne, GDPE, CSU  
2009- 2011 Doctoral Committee Member for A. Biagi Harper , Dept. of Atmospheric Science, CSU  
2006 External examiner for PhD dissertation, University of Viterbo, Italy

### **Post-doctoral and Research Scientist supervision**

2017-to-date: Dr. Andy Roberts. Project: Soil C modelling  
2012-2014: Dr. Claudia Boot. Project: BC-RAPID  
2010-2011: Dr. Karolien Denef. Project: Bluestem  
2009-2010: Dr. Catherine Stewart. Project: Tamarisk  
2005-2008: Dr. Ilaria Del Galdo. Projects: Carboeurope/Nitroeurope  
2006-2008: Dr. Ilaria Inghima. Project: Carboitaly  
2006-2008: Dr. Jerome Ngao. Project: Alice  
2006-2007: Dr. Mauro Rubino. Project: Campania Region Legge 5 (Co-supervisor)  
2005-2007: Dr. Giovanna Battipaglia. Projects: EuroFACE/Nitroeurope  
2002-2004: Dr. Jens Arne Subke. Project: Daimer

### **Faculty & University Services**

2017 to date: Associate Head, Dept. of Soil and Crop Science, CSU  
2017: Chair of Search committee, Dept. of Soil and Crop Sciences, CSU  
2016: Search committee member, Dept. of Ecosystem Science and Sustainability, CSU  
2015 to 2017: Chair of the Research Committee, and Research Advisor to the Head of the Dep. of Soil and Crop Science, CSU  
2014: Search committee member, Dept. of Soil and Crop Science, CSU  
2012 to 2017: Member of the Colorado State University Faculty Council  
2012 to 2014: Member of the Executive Committee of the Graduate Degree Program in Ecology, CSU  
2012 to date: Designated Representative for CSU on the International Memorandum of Understanding

- (IMOU) between the University of Vienna Bokum (Austria) and CSU.
- 2011 to date: Committee Chair of the EcoCore Analytical Facility.
- 2011 to date: Member of the Executive Committee of the Natural Resource Ecology Laboratory, CSU.
- 2011: Search committee member, EcoCore, Natural Resource Ecology lab, CSU
- 2010: Search committee member, Natural Resource Ecology lab, Colorado State University
- 2010 to date: Designated Representative for CSU on the International Memorandum of Understanding (IMOU) between the Second University of Naples (Italy) and CSU.
- 2009 to date: Director of the Stable Isotope Laboratory, Natural Resource Ecology lab, CSU
- 2009: Member (substitute) for the College of Agricultural Sciences of the Committee on Scholarship, Research and Graduate Education of Colorado State University
- 2004-2008: Chair of Departmental Committee and College delegate for the Committee for the Orientation of incoming, enrolled and outgoing students, Second University of Naples, I
- 2006-2008: Member of the Committee for the Student exchange program, Second University of Naples, I

### PROFESSIONAL SERVICES:

#### **Editorial Boards**

- 2003 to date Global Change Biology (Subject Editor; IF: 8.5)
- 2005 to 2007 Ecology letters (Subject Editor)
- 2005 to date Plant and Soil (Advisory Board of Editors/ Guest Editor of 2 Special Issues)

#### **Reviewer - Journals**

Nature, PNAS, Oecologia, Ecological Monograph, Ecosystem, Global Biogeochemical Cycle, Biogeosciences, Soil Biology & Biochemistry, New Phytologist, Scandinavian Journal of Forest Research, Australian Journal of Plant Physiology, Biology and Fertility of Soils, etc.

#### **Ad hoc Reviewer and Panelist for funding agencies**

National Science Foundation (Divisions of Biological Sciences and of Geosciences)

European Research Council

European Science Foundation

National Agency for the Evaluation of Universities and Research Institutes (Italy)

Italia/Francia University exchange program

Provincia Autonoma di Trento (Italy)

UK National Environmental Research Council (UK)

Fonds Wetenschappelijk Onderzoek – Vlaanderen (Belgium)

#### **Advisory Boards**

2007-2008: Science Steering Group – Registry of Forest C sinks. Italian Ministry of the Environment

2006-2008: Member of the Scientific Advisory board for the WWF, Italy.

2005-2008: Delegate for the Second University of Naples - INNOVA. Regional Center of Competences for the Protection of the Campania Region Cultural and Environmental Heritage

#### **Symposia Workshop and Conference Session Organization**

August 2013: The Front Range Stable Isotope Symposium, Fort Collins, Colorado, 16 August, 2013 (Organizer).

May 2013: 4th International Symposium on Soil Organic Matter, Nanjing, China. May 5-10, 2013 (International Scientific Committee Member)

December 2012: Convener of the Session B026. From Plant Litter Decay to Soil Organic Matter Formation: The Missing Nexus, at the AGU Fall Meeting 2012

July 2008: International Symposium on Soil Organic Matter Dynamics: Land Use, Management and Global Change”, Colorado Springs, Colorado, USA (member of the Scientific and Organizing committee)

November 2007: Final Conference of the ESF Programme "The Role of Soils in the Terrestrial Carbon Balance", Pont à mousson, Nancy, France (Convenior of the session on: *The impact of*

*environmental factors on the diversity and function of the microbial communities*)  
 February 2007: II Conference of the NITROEUROPE project, Paestum, Italy (Local Organizer, Scientific committee member)  
 September 2006: XVI National Conference of the Italian Ecological Society (S.It.E.), Viterbo, Italy (Scientific committee member).  
 May 2006: S.It.E. workshop on: “Teaching Ecology in School”, Rome, Italy (Organizer)  
 September 2005: XV National Conference of the S.It.E., Turin, Italy (Scientific committee member)  
 September 2004: JESIUM international symposium, Vienna, Austria (Convenior of the session on: *Stable Isotope in the Atmosphere and Biosphere exchange*).  
 October 2004: CARBOEUROPE e COST Action 627 joint international workshop on: *Partitioning soil CO2 efflux*, Capri Italy (Organizer, Scientific committee board Leader)  
 June 2003: Workshop of the EU project: "Forest Carbon-Nitrogen Trajectories" (Organizer).  
 2000: Exhibition on “Biodiversity”, Fondazione IDIS, Città della Scienza, Napoli (Scientific advisor)  
 2000-05 Working Group 1: Plant, Soil and Soil Organisms, COST Action 627: Carbon Storage in European Grasslands, meetings, Dublin (Ireland), Ghent (Belgium), Florence and Capri (Italy), Scientific Committee Leader and Organizer.  
 September 1998: Global Change in Terrestrial Ecosystems (GCTE)- COST Action 619, joint workshop on: Litter Quality and Decomposition under Elevated Atmospheric CO<sub>2</sub> , Capri, Italy (Local organizer, Scientific committee member)  
 September 1996: VII National meeting of the S.It.E, Naples, Italy (Organiser committee member)

### **Media products**

*RAI-educational*, Guest in the EXPLORA programs on “Millennium Ecosystem Assessment” and “Natural Forests vs Forest Plantations”  
*RAI-Utile*, Guest in the discussion programs on “Environmental Science in the education and public awareness” and “The state of frontier-edge international scientific research in Italy”  
*North Forty News*, March 12, 2012, Cited in “Turmoil over soil: A climate-warming wildcard”  
*North Forty News*, February 7, 2013, Cited in “CSU researchers study black carbon to learn environmental impact of wildfire” - <http://www.northfortynews.com/csu-researchers-study-black-carbon-to-learn-environmental-impact-of-wildfires/>  
*InnovationNews*, February 8, 2013, Cited in “CSU researchers get\$200k to study environmental impact of wildfire black carbon”- <http://innovationnews.com/innovation-news-releases/csu-researchers-get-200k-to-study-black-carbons-environmental-impact/>  
*You tube video*, <https://www.youtube.com/watch?v=HahDjm9H0eY&feature=youtu.be>

### **MEMBERSHIP IN PROFESSIONAL SOCIETIES:**

American Geophysical Union  
 American Ecological Society  
 Soil Ecology Society  
 Soil Science Society of America  
 Italian Ecological Society\_ S.It.E. (Steering committee member from 2005 to 2008)  
 British Ecological Society (1994- 2005)

### **AWARDS:**

2017: ASA-CSSA-SSSA Mentoring Award (\$1,500)  
 2016: NREL most publications award  
 2013: OECD Co-operative Research Program Fellow (\$11,000)  
 2011 to date: Donor award to the “Cotrufo-Hoppess fund for soil ecology research” (\$180,000)  
 2011 to date: Donor award to the “Cotrufo-Hoppess equipment fund for isotopic analyses” (\$1000)  
 2010: NREL Outstanding Advisor  
 1998: Smithsonian Institution Research Fellow.  
 1996: EU COST Action 619 Research Fellow.  
 1995: European Environmental Research Organization Research Fellow.  
 1995: Wolf Vishniac Award for Excellence, XII International Symposium on Environmental



Biogeochemistry, Rio de Janeiro, Brazil  
1994-95: British Council Research Fellow.

### OUTREACH ACTIVITIES:

- 2016: EPA Webinar, Entitled: “Biochar and the Soil Biogeochemistry Effects, Implementation and European initiatives” December, 2016
- 2016: Presentation to the Boulder County, entitled: “A possible climate-smart solution to organic waste: Biochar”. April 12<sup>th</sup>, 2016.
- 2015-to date: Development of the “Enrichment Science Program” for Bennett Elementary, Fort Collins.
- 2014: Lecturer in the Webinar for science teachers: “Biochar for a sustainable future: from the global to the molecular scale”, [https://www.youtube.com/watch?v=s-jf5T\\_LH78](https://www.youtube.com/watch?v=s-jf5T_LH78)
- 2013: Invited Speaker in the event: “Extending Carbon and Water: Taking it to the Next Level”, for K-12 teachers. CSU, February 23<sup>rd</sup>, 2013
- 2013: Invited Speaker at the Conference of the Colorado Science Education Network: “Earth, Water, and Fire: Engaging Students in Colorado Issues”. CSU, February 13<sup>th</sup>, 2013
- 2012: Proposer and Panellist for the “The Biochar Solution, Facts vs. Fiction”. SoGES Managing the Planet panel series event. Fort Collins, November 14<sup>th</sup>, 2012.
- 2012: Lecturer in the "Carbon Station Day": An hands-on research experience for science students at Fossil Ridge High School.
- 2012-2013: Research Experience for Teacher (RET) Advisor of Ms. Kathleen E. Guilbert, a 5<sup>th</sup> grader science teacher at Bella Romero Elementary (92% minority/low-income population) for the design and delivery of an hands-on research experience on decomposition. This work resulted in Ms Guilbert’s presentation at the AGU and her students presentation at the FRSES.
- 2011: Lecturer for the Colorado Council for Economic Education, of the course entitled: "the Energy Policies Toward a Better World – the US and EU", for high-school teachers.
- 2011-2012: RET Advisor of Mrs Laura Grissom, a science teacher at the Fossil Ridge High School
- 2011: Invited Speaker for the "Ground-up 3" event, Poudre Learning Centre, June 7<sup>th</sup>, 2011
- 2010-2011: RET Advisor of Ms Jessie Kneisler, an environmental science teacher at a Sherwood High School in Sherwood Oregon.

### PUBLICATIONS:

#### **International Refereed Journals:**

- 1) Harden, J., Hugelius, G., Ahlström, A., Blankinship, J., Bond-Lamberty, B., Lawrence, C., Loisel, J., Malhotra, A., Jackson, R., Ogle, S., Phillips, C., Ryals, R., Todd-Brown, K., Vargas, R., Vergara, S., **Cotrufo, M.F.**, Keiluweit, M., Heckman, K., Crow, S., Silver, W., DeLonge, M., Nave, L. (2017) Networking our science to characterize the state, vulnerabilities, and management opportunities of soil organic matter. *Global Change Biology*, in press.
- 2) Ramlow M, and Cotrufo M. F. (2017) Woody biochar’s greenhouse gas mitigation potential across fertilized and non-fertilized agricultural soils, and soil moisture regimes. *Global Change Biology Bioenergy*. in press.
- 3) Andres P., Moore, J.C., **Cotrufo M.F.**, Denef, K., Haddix, M.L., Molowny-Horas, R., Riba, M., Wall, D.H, (2017) Grazing and edaphic properties mediate soil biotic response to altered precipitation patterns in a semiarid prairie. *Soil Biology and Biochemistry*, 113: 263-274.
- 4) Chabbi, A., Lehmann, J., Ciais, P. Loescher, H., **Cotrufo, M.F.**, Don, A., SanClements, M., Schipper, L., Six, J., Smith, P. and Rumpel C. (2017) Aligning agriculture and climate policy. *Nature Climate Change*, 7: 307-309.
- 5) Rhoades, C. Minatre, K., Pierson, D., Feghel, T., **Cotrufo, M.F.** and Kelly, E. (2017) Examining the Potential of Forest Residue-Based Amendments for Post-Wildfire Rehabilitation in Colorado, USA. *Scientifica*, doi.org/10.1155/2017/4758316
- 6) Butnor, JR, Samuelson LJ, Johnsen KH, Anderson PH, González Benecke CA, Boot CM, **Cotrufo**

- MF, Heckman KA, Jackson JA, Stokes TA, Zarnoch SJ (2017) Vertical distribution and persistence of soil organic carbon in fire-adapted longleaf pine forests. *Forestry, Ecology and Management*, 390:15-26
- 7) Pressler Y, Foster E. **Cotrufo M.F.**, Moore J. (2017) Coupled biochar amendment and limited irrigation strategies do not affect a degraded soil food web in a maize agroecosystem, compared to the native grassland. *Global Change Biology Bioenergy*. doi: 10.1111/gcbb.12429
  - 8) da Silva Oliveira D.M., Paustian K., **Cotrufo M.F.**, Fiallosa A.R., Cerqueira A.G., Cerri C.E.P. (2017) Assessing labile organic carbon in soils undergoing land use change in Brazil: a comparison of approaches. *Ecological Indicators*.72:411-419.
  - 9) **Cotrufo M.F.**, Boot C., Kampf S., Nelson P., Haddix M.L., Ryan S., Rathburn S., MacDonald L., Brogan D.J., Schmeer S., Covino T. and Hall, E. (2016) Redistribution of pyrogenic carbon from hillslopes to stream sediments following a large montane wildfire. *Global Biogeochemical Cycles*, 30, doi:10.1002/2016GB005467
  - 10) **Cotrufo M.F.**, Boot C., Abiven, S., Foster E.J., Haddix M.L., Peisser M., Wurster C.M., Bird M.I., Schmidt M.W.I. (2016) Toward an accurate quantification of pyrogenic carbon in the environment: An integration of analytical approaches. *Organic Geochemistry*, 100:42-50.
  - 11) Foster EJ, Hansen N, Wallenstein M, Cotrufo MF (2016) Biochar and manure amendments impact soil nutrients and microbial enzymatic activities in a semi-arid irrigated maize cropping system. *Agriculture, Ecosystems & Environment*, 233, 404-414.
  - 12) Mitchell, E., Scheer, C., Rowlings, D., Conant, R.T., Grace, P., **Cotrufo, M.F.**, Van Delden, L., (2016) The influence of agricultural management strategies on GHG fluxes and stable SOM formation in a sandy soil. *Soil Biology and Biochemistry*.101:104-113
  - 13) Campbell, E.E., Parton, W.J., Soong, J.L., Paustian, K., Hobbs, N.T., **Cotrufo, M.F.** (2016). Tracking the fate of litter carbon using the Litter Decomposition and Leaching (LIDEL) model. *Soil, Biology and Biochemistry*, 100:160-174.
  - 14) Soong J., Dam M., Wall D.H., **Cotrufo M. F.**(2016) Fire in the tallgrass prairie: belowground biological responses to pyrogenic organic matter inputs and fire history. *Journal of Functional Ecology*, doi:10.1111/1365-2435.12693
  - 15) Jiang X., Haddix M.L., **Cotrufo M.F.** (2016) Interactions between biochar and soil organic carbon decomposition: Effects of nitrogen and low molecular weight carbon compound addition. *Soil Biology and Biochemistry*, 100:92-101.
  - 16) McKee G., Soong J.L., Calderon F., Borch T., **Cotrufo M.F.** (2016) An integrated spectroscopic and wet chemical approach to investigate grass litter decomposition chemistry. *Biogeochemistry*, 128:107–123
  - 17) Shaw, E.A., K Denef, CM de Tomasel, MF Cotrufo, DH Wall (2016) Fire affects root decomposition, soil food web structure and carbon flow. *SOIL*, 2, 199-210.
  - 18) Andrés, P., Moore J.C., Simpson R.T., Selby G.,**Cotrufo, M.F.**, Denef K., Haddix M.L., Shaw E.A., de Tomasel C.M., Molowny R., Wall D.H., (2016) Soil food web stability in response to grazing in a semi-arid prairie: the importance of soil heterogeneity. *Soil Biology and Biochemistry*, 97:131-143
  - 19) Bingham D. & **Cotrufo, M.F.** (2016). Organic nitrogen storage in mineral soil: implication for policy and management. *Science of the Total Environment*, 551-552:116-126
  - 20) Haddix M.H., Paul E., **Cotrufo M.F.** (2016) Dual, differential isotope labeling shows the preferential movement of labile plant carbon into mineral-bonded soil organic matter. *Global Change Biology*, 22, 2301–2312
  - 21) Soong J., Vandegehuchte M.L., Horton A.J., Nielsen U.N., Denef K, Shaw E. A., Milano de Tomasel C., Parton W., Wall D.H., **Cotrufo M. F.**(2016) Soil microarthropods support ecosystem productivity and soil C accrual: evidence from a litter decomposition study in the tallgrass prairie. *Soil Biology and Biochemistry*, 92:230-238
  - 22) **Cotrufo M.F.**, Soong J.L., Horton A.J., Campbell E.E., Haddix M.H., Wall D.L., Parton W.J. (2015) Soil organic matter formation from biochemical and physical pathways of litter mass loss. *Nature Geosciences*, doi:10.1038/ngeo2520.
  - 23) Jang X., Denef K., Stewart, C.E., **Cotrufo M.F.** (2015) Controls and dynamics of biochar decomposition and soil microbial abundance, composition, and carbon use efficiency during long-term

- biochar-amended soil incubations. *Biology & Fertility of Soils*, DOI 10.1007/s00374-015-1047-7
- 24) Smith P., House J. I., Bustamante M., Sobocka J., Harper R., Pan G., West P., Clark J., Adhya T., Rumpel C., Paustian K., Kuikman P., **Cotrufo M.F.**, Elliott J. A., McDowell R., Griffiths R.I., Asakawa S., Bondeau A., Jain A. K., Meersmans J., Pugh T.A.M. (2015). Global Change Pressures on Soils from Land Use and Management. *Global Change Biology*, DOI: 10.1111/gcb.13068.
  - 25) Smith, P., **M. F. Cotrufo**, C. Rumpel, K. Paustian, P. J. Kuikman, J. A. Elliott, R. McDowell, R. I. Griffiths, S. Asakawa, M. Bustamante, J. I. House, J. Sobocká, R. Harper, G. Pan, P. C. West, J. S. Gerber, J. M. Clark, T. Adhya, R. J. Scholes, and M. C. Scholes (2015) Biogeochemical cycles and biodiversity as key drivers of ecosystem services provided by soils. *SOIL*, 1, 665–685, 2015
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  - 27) Soong JL, Parton W, Calderon FJ, Campbell EE, **Cotrufo MF** (2015) A new conceptual model on the fate and controls of fresh and pyrolyzed plant litter decomposition. *Biogeochemistry*, DOI: 10.1007/s10533-015-0079-2
  - 28) Soong JL, **Cotrufo MF** (2015) Annual burning of a tallgrass prairie inhibits C and N cycling in soil, increasing recalcitrant pyrogenic organic matter storage while reducing N availability. *Global Change Biology*, 21: 2321-2333.
  - 29) Boot C, Haddix M, Paustian K, **Cotrufo MF** (2015). Distribution of black carbon in Ponderosa pine litter and soils following the High park wildfire. *Biogeosciences* 12, 3029–3039
  - 30) Soong J. L., Calderon F.J., Betzen J. & **Cotrufo M.F.** (2014) Quantifying and FTIR characterizing dissolved organic carbon and total dissolved nitrogen leaching from litter: a comparison of methods across litter types. *Plant and Soil*. 385:125-137
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  - 34) Gomez J. D., Deneff K., Stewart C. E., Zheng J. & **Cotrufo M. F.** (2014) Biochar addition rate influences soil microbial abundance and activity in temperate soils. *European Journal of Soil Science*. 65: 28-39.
  - 35) Soong J., Reuss D., Pinney C., Boyack T, Haddix M., Stewart C.E. & **Cotrufo M.F.** (2014) Design and operation of a continuous <sup>13</sup>C and <sup>15</sup>N labeling chamber for uniform or differential, metabolic and structural, plant tissue isotope labeling. *Journal of Visualized Experiments*, 83 | e51117 | Page 1 of 9 <http://www.jove.com/video/51117/design-operation-continuous-13c-15n-labeling-chamber-for-uniform-or?access=FP74RB74>
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  - 38) Field J.L., Keske C.M., Birch G., DeFoort M.W., **Cotrufo M.F.** (2013) Distributed biochar and bioenergy coproduction: a regionally specific case study of environmental benefits and economic impacts. *Global Change Biology, Bioenergy*. 5: 177-191

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- 54) Sutton M.A., E. Nemitz, J.W. Erisman, C. Beier, K. Butterbach Bahl, P. Cellier, W. de Vries, **F. Cotrufo**, U. Skiba, C. Di Marco, S. Jones, P. Laville, J.F. Soussana, B. Loubet, M. Twigg, D. Famulari, J. Whitehead, M.W. Gallagher, A. Neftel, C.R. Flechard, B. Herrmann, P.L. Calanca, J.K. Schjoerring, U. Daemmgen, L. Horvath, Y.S. Tang, B.A. Emmett, A. Tietema, J. Peñuelas, M. Kesik, N. Brüggemann, K. Pilegaard, T. Vesala, C.L. Campbell, J.E. Olesen, U. Dragosits, M.R. Theobald, P. Levy, D.C. Mobbs, R. Milne, N. Viogy, N. Vuichard, J.U. Smith, P. Smith, P. Bergamaschi, D. Fowler, S. Reis (2007) Challenges in quantifying biosphere-atmosphere exchange of nitrogen species. *Environmental Pollution*: 150, 125-139
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## Editor:

- “*Global Change and Terrestrial Ecosystems*” section In: Freedman B. (Ed.) *Global Environmental Change*: SpringerReference ([www.springerreference.com](http://www.springerreference.com)). Springer-Verlag Berlin Heidelberg, 0. DOI: 10.1007/SpringerReference
- Plant and Soil*, Vol.338 Special Issue on “SOM dynamics: Land Use, Management and Global Change”
- Global Change Biology* Vol. 12 Thematic session on “Soil CO<sub>2</sub> efflux partitioning”
- Plant and Soil*. Vol. 224, Special Issue on: “Litter quality and decomposition under elevated atmospheric CO<sub>2</sub>”.
- Journal of Mediterranean Ecology* Vol. 5, Special Issue on “PianosaLab research project”

## Encyclopedias:

- Enciclopedia della Scienza*, Rizzoli New Media, author of contribution on: “La Biosfera ed i cicli degli elementi (The Biosphere and the biogeochemical cycles)”.
- Enciclopedia del XXI secolo*, Istituto dell'Enciclopedia Italiana Treccani, author of contribution on “Biosfera”
- Encyclopedia of Life Support Systems*, EOLSS Publishers Co Ltd, for UNESCO, author of contribution on: “What is Global Change?”

## Invited presentations at scientific conferences:

- Cotrufo M.F.** (2017) *Toward a new modelling paradigm: from turnover-defined to physically-defined soil organic matter pools*. Key note speaker for the 6th International SOM Conference, Rothamsted (UK), September 2017.
- Cotrufo M.F.** (2015) *Soil organic matter formation from litter decomposition: A call for modeling of both DOM and POM pathways*. 5th International SOM Conference, Göttingen (D), September 2015.
- Cotrufo M.F.**, Fulton-Smith S., Haddix M., A.J. Horton, Soong J. (2014) *Recalcitrance: an inherent relative*

- attribute of plant litter describing its potential decomposability.* AGU Fall meeting, San Francisco 15-19 December, 2014
- Cotrufo M.F.**, J.L. Soong, A.J. Horton, E.E. Campbell and W.J. Parton (2014) *Above-ground litter-derived C and N stabilization in SOM: the key role of dissolved organic matter leaching and litter fragmentation.* AGU Fall meeting, San Francisco 15-19 December, 2014
- Cotrufo M.F.** (2013) *From Litter decomposition to SOM Formation: What are we missing?* ASA-CSSA-SSSA annual meeting, Tampa 3-8 November, 2013.
- Cotrufo M.F.** *From Litter decomposition to soil organic matter formation: through the eyes of isotopes.* Front Range Isotope Day. Laramie, Wyoming. August 2012
- Cotrufo M.F.** *Advancing the understanding of plant-soil atmosphere C and N exchanges by stable isotope techniques.* Isotope Mass Spectrometry Meeting. Trento, Italy April 2012
- Cotrufo M.F.** *Detecting Changes in Soil Carbon.* G-Scan meeting. Florence, April 2011
- Cotrufo M.F.** *Above-ground litter decomposition experiments: moving beyond mass loss.* AGU Fall meeting, San Francisco 13-17 December, 2010
- Cotrufo M.F.** *Detecting Changes in soil C pools and dynamics by means of stable isotopes and SOM fractionation.* III CARBOEUROPE conference, Finland, November 2005
- Cotrufo M.F.** *Understanding and quantifying soil C dynamics: when experiments meet models.* ESF-COST627-SSSB Workshop on “Soil C Modelling”, 10-13 April 2005 Aberdeen
- Cotrufo M.F.**, Bertolini T.; Inglema I.; Rubino M.; Marzaioli F.; Lubritto C.; Subke J.A.; Peressotti A. *Determination of  $\delta^{13}\text{C}$  CO<sub>2</sub> efflux: are we measuring the real thing?* CARBOEUROPE-COST 627 Joint workshop on “Soil CO<sub>2</sub> efflux partitioning”. 1-4 October 2004, Capri, Italy
- Cotrufo M.F.**: “*Carbon isotope methodologies: a breakthrough in the study of soil C dynamics*”, SIRIS 2004, 6-8 October 2004, Wien, Austria
- Cotrufo M.F.** *Decomposition processes in soils of FACE ecosystems*, FACE 2004 Ascona, Switzerland
- Cotrufo M.F.** *Plant, soil and atmospheric interactions in a changing environment.* 46<sup>th</sup> IAVS Symposium: “Water resources and vegetation”, 14-16 June 2003, Naples, Italy
- Cotrufo M.F.** *C-N interaction in litter decay.* Second CARBOEUROPE meeting, Budapest Hungary, 4-8 March 2002.
- Cotrufo M.F.**, Peressotti A, Del Galdo I., Six J., *Impact of land use on soil organic C stores and aggregation of soil organic matter fractions*, COST Action 627 meeting, Ghent, Belgium, 22-24 November, 2001.
- Cotrufo M.F.**: *Soils under elevated CO<sub>2</sub>: what is going on below ground?* COST Action 619, Ballyvaughan, Ireland, 5-9 June 1997.
- Cotrufo M.F.** Gorissen A.: *Carbon allocation in plant/soil systems of three perennial grass species as affected by elevated CO<sub>2</sub> concentrations and N fertilization.* COST Action 619, Colchester, UK, 22-24 November 1996.
- Cotrufo M.F.**, Gorissen A: *Effects of elevated atmospheric CO<sub>2</sub> and N availability on C and N cycling in plant/soil systems.* COST Action 619, Clearmont-Ferrand, France, 23-25 November 1995.