



European Science Foundation
MOLTER

Zurich, 10. December 2012
Final Report

Interdisciplinary workshop on unifying concepts of organic matter cycling in soil, river and marine environment

SOM-5: 5th International Workshop on Soil and Sedimentary Organic Matter Stabilization and Destabilization – Unifying concepts of organic matter dynamics in terrestrial and aquatic systems

Monte Verità, Switzerland, 7-11 October 2012

SOM-5, a workshop dedicated to cutting-edge discussion on global biogeochemical cycling of organic matter in soil, river and marine environment, was held in the Centro Stefano Franscini. The workshop gathered 95 participants, with the majority (70%) coming from member countries of the European Science Foundation, and the others mostly from USA, and some participants from Japan, Canada, New Zealand, Israel. Large proportions of the participants were female (40%), or qualified for the category young scientist, i.e. max. 3 years after PhD (37%).

Each day of the meeting had one leading theme: Theme 1 focused on “Organic matter mineral interactions”. Theme 2 was “Application of advanced methods for integrated perspectives on organic matter”. Theme 3 was “Organic matter dynamics and global change. Theme 4, was “Organic matter from soil to ocean – unifying OM budgets and process understanding”. These four themes were addressed with five formats, i.e. Frontiers Talk, Plenary Session, Breakout Groups, Poster Sessions, and the Hot Topics. The evening before, a Frontiers Talk was given by experienced scientists from neighboring scientific areas, showing new perspectives to the topic, and setting the stage for the following day. The morning Plenary Session were chaired by experienced scientists from the field, one from the terrestrial and one from the aquatic community. Within this session two Emerging Scientists (ca. 3-7 years after PhD) presented very recent, novel and thought provoking results. The chairs moderated the 30 minutes of discussion and prepared topics for the following Breakout Groups. After the coffee break the plenum was split into four Breakout



Groups which discussed topics assigned by the session chairs. Each group had a moderator (typically a session chair or one of the local organizers), and two “rapporteurs” (i.e. two volunteer young scientists). Results of the Breakout Groups were reported back to the plenum in a brief wrap-up session before lunch. On Monday and Wednesday lunch was followed by one hour with three „Hot Topics“ talks, selected from the topics submitted by the young scientists. Afternoons basically were reserved for informal interactions, and a field trip. Before dinner, the three Poster Sessions with 25-30 posters each, gave every presenter ample of time and space to discuss results.

Overall, the workshop was very successful and the main results will be highlighted in a meeting report in EOS, the weekly newspaper for members of the American Geophysical Union. The conference was financially sponsored by the European Science Foundation, MOLTER program, and the Centro Stefano Franscini / Swiss National Science Foundation. Tim Eglinton (ETH Zurich), Samuel Abiven (University of Zurich), Jens Leifeld (Agroscope Reckenholz-Tänikon Research Station ART), Frank Hagedorn (Swiss Federal Institute for Forest, Snow and Landscape Research WSL) co-organized the meeting and contributed to this meeting report.

University of Zurich
Department of Geography

Prof. Dr. Michael W. I. Schmidt

SOM-5

5th International Workshop on Soil and Sedimentary Organic Matter
Stabilization and Destabilization
Unifying concepts of organic matter dynamics in terrestrial and aquatic systems

7-11 October, 2012
Centro Stefano Franscini, Monte Verità, Ascona, Switzerland



Program and posters list

Sponsors

We gratefully acknowledge the following institutions for their generous support:



Molter (www.molter.no)



European Science Foundation (www.esf.org)



Centro Stefano Francini (www.csf.ethz.ch)



Swiss National Science Foundation (www.snf.ch)

Local organizing committee

Michael W. I. Schmidt and **Samuel Abiven**, *University of Zurich*

Timothy Eglinton, *ETH Zurich*

Jens Leifeld, *Agroscope Reckenholz-Tänikon Research Station ART*

Frank Hagedorn, *Swiss Federal Institute for Forest, Snow and Landscape Research WSL*

Paolo Demaria, *Demaria Event Management*

Theme Chairs

Kate Lajtha, *Oregon State University, USA*

Richard Keil, *University of Washington, USA*

Richard Evershed, *University of Bristol, UK*

Ingrid Kögel-Knabner, *Technical University Munich, Germany*

Joshua Schimel, *University of California Santa Barbara, USA*

Örjan Gustafsson, *Stockholm University, Sweden*

Gerd Gleixner, *Max-Planck-Institute for Biogeochemistry, Germany*

Peter Raymond, *University of Yale, USA*

Sunday, October 7th, 2012

From 16.00	Registration opens
17.30-18.30	Welcome reception
18.30-20.00	Dinner
20.00-20.10	Welcome by organizer and MOLTER
20.15-21.00	Perspectives to improve the description of soil and sediments carbon cycling in earth system models Philip Ciais , <i>Laboratoire des Sciences du Climat et de l'Environnement, Gif sur Yvette, France</i>
21.00-21.45	Mineral matrices and organic matter Richard Keil and L. Mayer, <i>University of Washington, USA</i>

Monday, October 8th, 2012

Theme 1	Organic matter mineral interactions
Chair:	Kate Lajtha, <i>Oregon State University, USA</i> Richard Keil, <i>University of Washington, USA</i>
8.15-8.30	Welcome address from Centro Stefano Franscini
08.30-9.15	Mineral-associated organic matter – Stable but still sensitive Susan E. Crow <i>University of Hawaii, USA</i>
9.15-10.00	Soil mineral–organic associations — How structure rules reactivity Robert Mikutta <i>University of Hannover, Germany</i>
10.00-10.30	Coffee break
10.30-10.45	Group topics assignments
10.45-12.00	Breakout groups (topics provided by the chairs)
12.00-12.30	Wrap up (5 minutes) given by rapporteur of each group, Q & A
12.30-14.00	Lunch
14.00-14.15	Group picture

- 14.15-14.35 **Microbial utilization of low molecular weight organic substances in soil evaluated by position-specific labeling and compound-specific ¹³C-PLFA-analysis**
Michaela Dippold^{a,b}, C. Apostel^a, B. Glaser^c and Y. Kuzyakov^b
^a *University of Bayreuth, Germany*
^b *Georg-August-University of Göttingen, Germany*
^c *Martin-Luther-University, Halle-Wittenberg, Germany*
- 14.35-14.55 **Micro-scale distribution of litter-derived organic matter in mineral fractions as revealed by nano-scale secondary ion mass spectrometry (NanoSIMS)**
Cordula Vogel^a, C. W. Müller^a, C. Höschen^a, K. Heister^a,
A. Bannert^b, F. Buegger^b and I. Kögel-Knabner^a
^a *Technical University Munich, Germany*
^b *Helmholtz Centre, Munich, Germany*
- 14.55-15.15 **Deep soil carbon loss under an aggrading old-field forest**
Megan L. Mobley^{ab}, D. deB. Richter^b, K. Lajtha^c, M. G. Kramer^d and P. R. Heine^b
^a *University of Wyoming, USA*
^b *Duke University, USA*
^c *Oregon State University, USA*
^d *US Forest Service, USA*
- 15.15-16.30 Free time – interaction
- 16.30-17.00 Coffee break
- 17.00-18.30 Poster session 1 (Posters from Theme 1 and 2).
- 18.30-20.00 Dinner
- 20.15-21.00 **Soil biogeochemistry and compound-specific stable isotope probing: progress and prospects**
Richard Evershed
University of Bristol, UK

Tuesday, October 9th, 2012

- Theme 2 Application of advanced methods for integrated perspectives on organic matter**
- Chair Richard Evershed, *University of Bristol, UK*
Ingrid Kögel-Knabner, *Technical University Munich, Germany*
- 08.30-9.15 **Soil bacterial membrane lipids as recorders of (past) environmental changes and carbon cycle dynamics**
Francien Peterse
ETH Zurich, Switzerland

- 9.15-10.00 **Composition and surface properties of Fe oxide associated organic matter**
Karin Eusterhues
University of Jena, Germany
- 10.00-10.30 Coffee break
- 10.30-10.45 Group topics assignments
- 10.45-12.00 Breakout groups (topics provided by the chairs)
- 12.00-12.30 Wrap up (5 minutes) given by rapporteur of each group, Q & A
- 12.30-14.00 Lunch
- 14.00-14.20 **Combined molecular biomarker – microbial incubation approach to investigate organic matter mineralization in the East Siberian Shelf Sea sediments**
Emma S. Karlsson^a, V. Brücherta, A. Charkin^c, O. Dudarev^c, I. Semiletov^{c,d}, and Ö. Gustafsson^a
^a*Stockholm University, Sweden*
^c*Russian Academy of Sciences, Vladivostok, Russia*
^d*University of Alaska Fairbanks, USA*
- 14.20-14.40 **Non-chromophoric ‘invisible’ DOC in hourly-resolved headwater river records from Northern Amazonia, Central Guyana**
Ryan Pereira^a, C.I. Bovo^{a,b}, R.G.M. Spencer^c, P.J. Hernes^d, E. Tipping^e, A. Franklin^b, G. Parkin^a and T. Wagner^a
^a*Newcastle University, UK*
^b*Iwokrama International Centre for Rainforest Conservation and Development, Guyana*
^c*Woods Hole Research Center, Falmouth, USA*
^d*University of California Davis, USA*
^e*Centre for Ecology & Hydrology, Lancaster, UK*
- 14.40-15.00 **Hindcasting the evolution of organic matter deposition, reactivity and degradation over geological time scales : insights from reaction-transport models**
Sandra Arndt^a, H.-J., Brumsack^b and L. Wehrmann^c
^a*University of Bristol, UK*
^b*Carl-von-Ossietzky University, Oldenburg, Germany*
^c*UC Riverside, USA*
- 15.00-19.00 Excursion to Cardada (bad weather option: Bellinzona)
- 19.15-20.45 Dinner
- 20.45-21.30 **Two aspects of soils in global change**
Margaret Torn
UC Berkeley, USA

Wednesday, October 10th, 2012

Theme 3

Organic matter dynamics and global change

Chair

Joshua Schimel, *University of California Santa Barbara, USA*
Örjan Gustafsson, *Stockholm University, Sweden*

08.30-9.15

Dynamics of fluvial release of terrestrial organic carbon and climate: forcing, feedback or both?

Valier Galy^a, C. Hein^a, B. Peucker-Ehrenbrink^a and T.I. Eglinton^b

^a *Woods Hole Oceanographic Institution, USA*

^b *ETH, Zurich, Switzerland*

9.15-10.00

Where are the microbes in new microbial-based concepts of soil organic matter formation?

Stuart Grandy

University of New Hampshire, USA

10.00-10.30

Coffee break

10.30-10.45

Group topics assignments

10.45-12.00

Breakout groups (topics provided by the chairs)

12.00-12.30

Wrap up (5 minutes) given by rapporteur of each group, Q & A

12.30-14.00

Lunch

14.00-16.30

Free time – interaction

16.30-17.00

Coffee break

17.00-18.30

Poster session 2 (Posters from Theme 3 and 4)

18.30-20.30

Conference dinner

20.30-21.15

The Pulse-Shunt-Concept: A new conceptual framework for understanding DOM fluxes and reactions in drainage basins

Peter Raymond

University of Yale, USA

Thursday, October 11th, 2012

Theme 4 Organic matter from soil to ocean – unifying organic matter budgets and process understanding

Chair Gerd Gleixner, *Max-Planck-Institute for Biogeochemistry, Germany*
Peter Raymond, *University of Yale, USA*

08.30-9.15 **Movement of DOC from soils to groundwater and surface waters**
Jan Siemens
University of Bonn, Germany

9.15-10.00 **The geochemistry and reactivity of riverine dissolved organic matter**
Rob Spencer
Woods Hole Research Center, USA

10.00-10.30 Coffee break

10.30-10.45 Group topics assignments

10.45-12.00 Breakout groups (topics provided by the chairs)

12.00-12.30 Wrap up (5 minutes) given by rapporteur of each group, Q & A

12.30-14.00 Lunch

14.00 Departure

Poster Session 1

Monday, October 8th, 17.00 – 18.30
Balint Room

Posters from Theme 1 (14 posters) and Theme 2 (15 posters)

Posters are sorted alphabetically by presenting author.

Theme 1 Organic matter mineral interactions

Interaction of organic compounds with iron bearing minerals and the effect of irradiation

Maria Andrianaki^a, K.V. Ragnarsdottir^b, T. McMaster^c and K.R. Hallam^d

^a *Geological Institute, ETH Zurich, Switzerland*

^b *School of Engineering and Natural Sciences, University of Iceland, Iceland*

^c *School of Physics, University of Bristol, UK*

^d *Interface Analysis Centre, University of Bristol, UK*

Nature of organo-mineral particles aggregated by different bonding strength in an Andisol derived from volcanic ashes

Maki Asano and R. Wagai

National Institute for Agro-Environmental Sciences, Tsukuba, Ibaraki, Japan

Structure of short-range ordered aluminosilicates in andic horizons of volcanic soils

Isabelle Basile-Doelsch^a, C. Levard^a, E. Doelsch^b, Z. Abidin^{c,d}, H. Miche^a, A. Masion^a, J. Rose^a, D. Borschneck^a and J.-Y. Bottero^a

^a *CEREGE, CNRS, Aix-Marseille University, IRD, Collège de France, Europôle Méditerranéen de L'Arbois, Aix en Provence, France*

^b *CIRAD, UPR Recyclage et risque, Montpellier, France*

^c *Laboratory of Applied Chemistry for Environmental Industry, Faculty of Agriculture, Ehime University, Japan*

^d *Laboratory of Inorganic Chemistry, Faculty of Mathematics and Science, Bogor Agriculture University, Indonesia*

Stabilization dynamics of fine root versus needle-derived ^{13}C and ^{15}N during 10 years in a temperate forest soil

Jeffrey A. Bird^a, C. Castanha^b and M.S. Torn^b

^a*School of Earth & Environmental Sciences, Queens College, City University of New York, USA*

^b*Earth Science Division, Lawrence Berkeley National Laboratory, USA*

Century scale protection of organic matter in soil aggregates. An approach using long-term bare fallow experiments

Claire Chenu^a, R. Paradelo^b and F. Van Oort^c

^a*AgroParisTech, Bioemco, Grignon, France*

^b*INRA, Pessac, Versailles, France*

Distribution and mineralisation rate of soil organic matter at the pore scale

Claire Chenu^a, L.S. Ruamps^a, N. Nunan^a, V. Pouteau^a, J. Leloup^b, X. Raynaud^b and V. Roy^b

^a*AgroParisTech-UPMC-CNRS-INRA, Bioemco, Grignon, France*

^b*UPMC, Bioemco, Paris, France*

^c*UPEC, Bioemco, Créteil, France*

Mapping the distribution of lipids adsorbed onto ceramic surfaces: nature of organic-mineral interactions and implications for the analysis of archaeological materials

Larisa Goldenberg^{a,b}, R. Neumann^c and S. Weiner^{a,b}

^a*Kimmel Center for Archaeological Science, Weizmann Institute of Science, Israel*

^b*Department of Structural Biology, Weizmann Institute of Science, Israel*

^c*Department of Organic Chemistry, Weizmann Institute of Science, Israel*

Combined application of black carbon and CaCO_3 to increase organic matter retention in silt-sized aggregates

Michael Kaiser^a, T. Ghezzehei^a, D. Myrold^b, M. Kleber^b and A. A. Berhe^a

^a*School of Natural Sciences, University of California, Merced, USA*

^b*Department of Crop & Soil Science, Oregon State University, USA*

Cycling of dissolved organic matter in soils – the key to understand soil organic matter turnover

Karsten Kalbitz^a and K. Kaiser^b

^a*Earth Surface Science, Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam, The Netherlands*

^b*Soil Sciences, Martin Luther University Halle-Wittenberg, Germany*

Stabilization of microbial biomass in soils as a significant process of SOM formation

Anja Miltner^a, R. Kindler^b, J. Achtenhagen^a, C. Schurig^a and M. Kästner^a

^a *Helmholtz Centre for Environmental Research - UFZ, Department of Environmental Biotechnology, Leipzig, Germany*

^b *Technische Universität Berlin, Department of Ecology, Berlin, Germany*

Role of soil mineralogy affecting soil organic carbon stocks in heavily weathered tropical savannas

Gustavo Saiz^{a,b}, M.I. Bird^b, J. Lloyd^b and K. Butterbach-Bahl^a

^a *Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany*

^b *School of Earth and Environmental Sciences, James Cook University, Australia*

Mineral stabilised soil organic matter: An isotope tracer study

Jonathan Sanderman^{a,b}, T. Maddern^{a,b} and J. Baldock^{a,b}

^a *CSIRO Sustainable Agriculture National Research Flagship, Australia*

^b *CSIRO Land and Water, Australia*

Organic carbon–particle association of suspended and bank sediments in the Fraser River basin, Canada

Britta M. Voss^{a,b,c}, T. I. Eglinton^c, B. Peucker-Ehrenbrink^a and V. Galy^a

^a *Marine Chemistry & Geochemistry, Woods Hole Oceanographic Institution, USA*

^b *Earth, Atmospheric, & Planetary Sciences, Massachusetts Institute of Technology, USA*

^c *Department of Earth Sciences, ETH Zurich, Switzerland*

Changes in the chemistry and surface nature of organo-mineral aggregate with particle density in an Andisol derived of volcanic ashes

Rota Wagai^a, M. Kajiura^a, Y. Inoue^b, M. Asano^a, M. Uchida^c, S. Hiradate^a and Y. Shirato^a

^a *National Institute for Agro-Environmental Sciences, Tsukuba, Ibaraki, Japan*

^b *Department of Earth Resources Engineering, Kyushu University, Fukuoka, Japan*

^c *National Institute of Environmental Studies, Tsukuba, Ibaraki, Japan*

Theme 2

Application of advanced methods for integrated perspectives on organic matter

Advances in thermally assisted hydrolysis and methylation (THM) for the study of organic carbon in terrestrial ecosystems

Geoffrey D. Abbott^a, E. Y. Swain^a, A. Muhammad^a, K. Allton^b, L. R. Belyea^b, C. G. Laing^b and G. L. Cowie^c

^a *School of Civil Engineering and Geosciences, Newcastle University, UK*

^b *School of Geography, Queen Mary University of London, UK*

^c *School of Geosciences, Edinburgh University, UK*

Distribution of maize root rhizodeposition in soil organic matter fractions and turnover of maize root structural fractions in the soil

Jürgen Augustin^a, R. Remus^a, R. H. Ellerbrock^b, J. Habermann^b and J. Pörschmann^c

^a *Institute for Landscape Biogeochemistry, Leibniz-Centre for Agricultural Landscape Research (ZALF e. V.), Germany*

^b *Institute for Soil Landscape Research, Leibniz-Centre for Agricultural Landscape Research (ZALF e. V.), Germany*

^c *Department für Technische Umweltchemie, Helmholtz-Zentrum für Umweltforschung (UFZ GmbH), Germany*

Hydrogen isotopic composition of branched GDGTs as indicator of soil organic carbon source within drainage basins

Nora Ernst, F. Peterse and T.I. Eglinton

Biogeoscience, Geological Institute, ETH Zurich, Switzerland

Sedimentary integration of plant leaf waxes

Sarah J. Feakins and A. J. West

Department of Earth Sciences, University of Southern California, USA

Distribution and composition of soil organic matter pools under conservation tillage systems

José M. Fernández^a, D. Courtier-Murias^b, A. Polo^a, C. Plaza^a and A.J. Simpson^b

^a *Instituto de Ciencias Agrarias, CSIC, Spain*

^b *Department of Chemistry, University of Toronto, Canada*

Unraveling aggregate structure by sequential ultrasound application?

Markus Graf and F. Lang

Department of Soil Science, Berlin Institute of Technology, Germany

markus.graf@tu-berlin.de

Amino sugar dynamics in forest soils under increased nitrogen deposition – Composition and turnover in soil density fractions

Marco Griepentrog^a, S. Bodé^b, P. Boeckx^b and M.W.I. Schmidt^a

^a *Department of Geography, University of Zurich, Switzerland*

^b *Department of Applied Analytical and Physical Chemistry, Ghent University, Belgium*

Interface studies of black carbon and minerals in soil

Johannes Lehmann, Karen Heymann and Dawit Solomon

Department of Crop and Soil Sciences, Cornell University, USA

Stabilization of ancient organic matter in deep buried paleosols

Erika Marín-Spiotta^a, N.T. Chaopricha^b, C.W. Müller^c, A. Dieffendorf^d, A. Plante^e, S. Grandy^f and J.A. Mason^a

^a *Geography, University of Wisconsin-Madison, USA*

^b *Nelson Institute for Environmental Studies, University of Wisconsin-Madison, USA*

^c *Lehrstuhl für Bodenkunde, TU München, Germany*

^d *Geology, University of Cincinnati, USA*

^e *Earth and Environmental Science, University of Pennsylvania, USA*

^f *Natural Resources and the Environment, University of New Hampshire, USA*

Advances in soil organic matter characterization by thermal analysis using evolved CO₂ gas analysis

Alain F. Plante^a, C. Peltre^a and J. M. Fernández^b

^a *Department of Earth & Environmental Science, University of Pennsylvania, USA*

^b *Instituto de Ciencias Agrarias, Consejo Superior de Investigaciones Científicas, Spain*

Advances in molecular research for the terrestrial C cycle with the MOLTER research networking programme

Daniel P. Rasse^a and L. Cécillon^b

^a *Bioforsk, Norwegian Institute for Agricultural and Environmental Research, Norway*

^b *Irstea, National Research Institute of Science and Technology for Environment and Agriculture, France*

Subcritical water extraction to isolate kinetically different soil nitrogen fractions

Steven Sleutel^a, M.A. Kader^b, S.A. Begum^b, K. Demeestere^c and S. De Neve^a

^a *Department of Soil Management, Ghent University, Belgium*

^b *Department of Soil Science, Bangladesh Agricultural University, Bangladesh*

^c *Department of Sustainable Organic Chemistry and Technology, Ghent University, Belgium*

Unsupervised mapping of SOM quality in a Histosol profile using PCA-transformed hyperspectral data

Markus Steffens^a, M. Kohlpaintner^b and H. Buddenbaum^c

^a *Lehrstuhl für Bodenkunde, Technische Universität München, Germany*

^b *Fachgebiet für Waldernährung und Wasserhaushalt, Technische Universität München, Germany*

^c *Environmental Remote Sensing and Geoinformatics, University of Trier, Germany*

Tracing organic matter dynamics within the plant-soil system by continuous multi-isotope labelling (¹³C, ¹⁸O and ²H)

Mirjam S. Studer^{a,b}, S. Abiven^a, R. T. W. Siegwolf^b and M. W. I. Schmidt^a

^a *Soil Science & Biography, University of Zurich, Switzerland*

^b *Laboratory of Atmospheric Chemistry, Paul Scherrer Institute, Switzerland*

Improved quantification of pyrogenic carbon in soils and sediments by a HPLC-DAD method

Daniel B. Wiedemeier^a, M. D. Hilf^a, R. H. Smittenberg^b and M.W.I. Schmidt^a

^a *Department of Geography, University of Zurich, Switzerland*

^b *Department of Geological Sciences, University of Stockholm, Sweden*

Poster Session 2

Wednesday, October 10th, 17.00 – 18.30
Balint Room

Posters from Theme 3 (20 posters) and Theme 4 (15 posters)

Posters are sorted alphabetically by presenting author.

Theme 3 Organic matter dynamics and global change

Unravelling changes in soil C stabilisation and destabilisation due to treatments over 30+ years in agricultural trials

W. Troy Baisden^a, L.A. Schipper^b, J. Sanderman^c, and M. Dodd^d

^a *National Isotope Centre, GNS Science, New Zealand*

^b *Univ. of Waikato, New Zealand*

^c *CSIRO Land and Water, Australia*

^d *AgResearch, New Zealand*

Soil organic matter evolution during long-term bare fallow and implications for sensitivity to global change

Pierre Barré^a, L. Cécillon^b, A.F. Plante^c, C. Chenu^d, B.T. Christensen^e, J.M. Fernandez^c, S. Houot^f, T. Kätterer^g, F. van Oort^h, C. Peltre^c and P.R. Poultonⁱ

^a *Geology laboratory, ENS/CNRS, France*

^b *Unité Ecosystèmes Montagnards, IRSTEA, France*

^c *Earth and Environmental Science, University of Pennsylvania, USA*

^d *BIOEMCO laboratory, AgroParisTech, France*

^e *Faculty of Agricultural Sciences, University of Aarhus, Denmark*

^f *EGC laboratory, AgroParisTech-INRA, France*

^g *Department of Soil and Environment, Swedish University of Agricultural Sciences, Sweden*

^h *PESSAC laboratory, INRA, France*

ⁱ *Rothamsted research, Department of Soil Science, UK*

Influence of organic carbon quality on the temperature sensitivity of soil respiration observed in long-term bare fallow soil incubations

Pierre Barré^a, R. Lefèvre^b, F. Moyano^b, G. Bardoux^b, B.T. Christensen^c, C. Girardin^b, S. Houot^d, T. Kätterer^e, F. van Oort^f and C. Chenu^b

^a *Geology laboratory ENS/CNRS, France*

^b *BIOEMCO laboratory AgroParisTech, France*

^c *Faculty of Agricultural Sciences University of Aarhus, Denmark*

^d *EGC laboratory AgroParisTech-INRA, France*

^e *Department of Soil and Environment Swedish University of Agricultural Sciences, Sweden*

^f *PESSAC laboratory INRA, France*

Soil warming across timescales: from enzyme kinetics to biogeochemical indicators

Sharon A. Billings^a, S.E. Ziegler^b, F. Ballantyne^a, C. Lehmeier^a, J. Li^a, and C. Lane^c

^a *Dept. of Ecology and Evolutionary Biology, Kansas Biological Survey, U. of Kansas, USA*

^b *Dept. of Earth Sciences, Memorial University of Newfoundland, Canada*

^c *Dept. of Geography and Geology, U. of North Carolina Wilmington, USA*

Labile and recalcitrant DOM interactions in stream benthic biofilms: DOM transformations tracked using Orbitrap mass spectrometry and fluorescence spectroscopy

Nancy R. Burns, M. M. Bengtsson, K. Wagner, E.R. Herberg, D. Engelmeier and Tom J Battin

Department of Limnology, University of Vienna, Austria

Reducing soil carbon turnover by dilution – exploring the constraints of microbes as catalysts for carbon turnover

Axel Don^a, G. Gleixner^b, S. Gebbert^a and C. Rödenbeck^b

^a *Thünen Institute of Agricultural Climate Research, Braunschweig, Germany*

^b *Max Planck Institute for Biogeochemistry, Jena, Germany*

Experimental soil warming leads to sustained losses of old C from alpine treeline ecosystems

Frank Hagedorn^a, M. Dawes^a, C. Rixen^a and K. Streit^b

^a *Swiss Federal Institute of Forest, Snow and Landscape Research (WSL), Birmensdorf, Switzerland*

^b *Paul-Scherrer Institute (PSI), Villigen, Switzerland*

Green alder encroachment on alpine meadows: limited effects on SOM after 40 years

Matthias Hunziker, C. Caviezel and N.J. Kuhn

Physical Geography and Environmental Change/ Environmental Department, University of Basel, Switzerland

Influence of forest management on the carbon stock in coarse woody debris and soil

Inken Krüger^a, C. Schulz^b and W. Borken^a

^a *Department of Soil Ecology, University of Bayreuth, Germany*

^b *Bavarian State Institute of Forestry, Germany*

Changes in soil carbon following woody encroachment in a desert ecosystem

Kate Lajtha^a, H. L. Throop^b and M. Kramer^c

^a *Dept. Crop and Soil Sciences, Oregon State University, Oregon, USA*

^b *Biology Department, New Mexico State University, New Mexico, USA*

^c *Department of Geology, Portland State University, Oregon, USA*

Seasonal variability of the composition of the dissolved organic matter mobilized in stream waters over one hydrological cycle in a headwater catchment

Thibault Lambert, A.C. Pierson-Wickmann and G. Gruau

UMR 6118 Géosciences Rennes, Université de Rennes1 – CNRS, France

Soil carbon stabilization is driven by the ratio of C input to the mass of mineral soil

Jens Leifeld^a and F. Conen^b

^a *Air Pollution / Climate Group, Agroscope Research Station ART, Zurich, Switzerland*

^b *Institute of Environmental Geosciences, University of Basel, Basel, Switzerland*

Effect of climate and agricultural management on soil organic fractions in Europe

Rie Nemoto^a, K. Klumpp^a, M. Dondini^b, Y. A. Teh^c, E. Veenendaal^d, M. Saunders^e, J. Duyzer^f, B. Osborne^e, J. Leifeld^g, T. Scott^h, K. Goulding^h and P. Smith^b

^a *INRA Clermont-Ferrand, Site du Crouël, UREP, Clermont-Ferrand, France*

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How different land-use changes affect soil organic carbon- use of stable isotopes and carbon fractions to explore carbon dynamics

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Soil organic matter stabilization in cryoturbated arctic soils

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The DIRT on Q10: Differential temperature response of soils depleted of labile inputs

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“Mechanistic” representation of abiotic and biotic processes in multi-scale SOM dynamics models

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C and N mineralization in forest soils at low temperatures

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A general framework for representing soil organic matter decomposition in models

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High biolability of organic matter in ancient permafrost upon thaw

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Theme 4

Organic matter from soil to ocean: unifying organic matter budgets and process understanding

Mobility and stability of root and leaf specific biomarkers during litter decomposition: Impact of priming

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Whole watershed quantification of net carbon fluxes by erosion and deposition within the Christina River Basin Critical Zone Observatory

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Evolution of mineral-organic matter associations after lateral redistribution of topsoil by erosion

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The role of fjords in the global organic carbon cycle: A case study in Fiordland, NZ

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Chlorophyll degradation products in soil – Towards reconstructing past terrestrial N cycles?

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Protracted storage of dissolved lignin in soils?

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Fluxes of dissolved organic carbon in tropical forest soils

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Spatio-temporal variability of the molecular fingerprint of dissolved organic matter in a headwater agricultural catchment

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Biogeochemistry of dissolved organic matter in the Arctic permafrost and the Lena delta

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The effect of variable snow cover regimes on respiration and SOM characteristics from translocated soils in a wooded pasture system

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Membrane lipids of soil bacteria as tracers for land-ocean soil carbon transfer dynamics

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Soil carbon and Earth System Models together for future climate predictions

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Processing of terrestrially derived dissolved organic matter in an alpine stream network

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In the long term roots do not influence C_{org} content in deep subsoil but alter its chemical composition

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