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### Education

Ph.D. Energy and Resources, University of California, Berkeley, 1994  
M.S. Energy and Resources, University of California, Berkeley, 1990  
B.S. Conservation and Resource Studies, Highest Honors, University of California, Berkeley, 1984

### Professional Positions

Program Domain Head and Senior Advisor (since 2015), Lawrence Berkeley National Lab, 2001-Present  
Senior Scientist, Climate and Ecosystem Sciences Division, Lawrence Berkeley National Lab, 2013-Present  
Adjunct Professor, Energy and Resources, U.C. Berkeley, 2018-present  
Associate Adjunct Professor, Energy and Resources, U.C. Berkeley, 2005-2018  
Staff Scientist, Earth Sciences Division, Lawrence Berkeley National Laboratory, 2005-2013  
Scientist, Earth Science Division, Lawrence Berkeley National Laboratory, 1998-2005  
Post-Doctoral Fellow, U.C. Irvine and Stanford University, 1994-1998  
Graduate Research Assistant, Energy and Resources Group, U.C. Berkeley, 1986-1994  
Research Principal Investigator, Rocky Mountain Biological Laboratory, Colorado, 1991-1993  
Science Intern, Lawrence Livermore National Laboratory, 1985-1986

### Fellowships, Honors, and Elected Positions

President, AGU Biogeosciences Section, 2021-2022  
President-Elect, AGU Biogeosciences Section, 2019-2020  
Berkeley Lab Director's Award for Exceptional Achievement in Science, 2017  
Union Fellow, American Geophysical Union, 2017  
Women @ The Lab award, 2015  
Honorary Doctorate, University of Zurich, Faculty of Mathematics and Natural Sciences, 2015  
Secretary of Energy Outstanding Mentor Award, 2008  
Presidential Early Career Award for Scientists and Engineers, 2003  
DOE Early Career Award for Scientists and Engineers, 2003  
Earth System Science Post-Doctoral Fellowship, 1994-1997  
NASA Global Change Doctoral Fellowship, 1991-1994  
Switzer Environmental Fellowship, 1990-1992  
Graduate Opportunity Fellowship, U.C. Berkeley, 1986-87

### Peer-reviewed Publications and Data sets (*\*indicates student or post doc*)

Abramoff, R.Z., K. Georgiou, B. Guenet, M.S. Torn, Y. Huang, H. Zhang, W. Feng, S. Jagadamma, K. Kaiser, D. Kothawala, M.A. Mayes, P. Ciais. 2021. How much carbon can be added to soil by sorption? *Biogeochemistry*, 1-16

Williams, J.H., R.A. Jones, B. Haley, G. Kwok, J. Hargreaves, J. Farbes, and M.S. Torn. 2021. Carbon-neutral pathways for the United States. *AGU Advances*, 2(1), p.e2020AV000284.

Delwiche, K.B., S.H. Knox, A. Malhotra, E. Fluett-Chouinard, G. McNicol, S. Feron, Z. Ouyang, D. Papale, ...and R. Jackson. 2021. FLUXNET-CH4: A global, multi-ecosystem dataset and analysis of methane seasonality from freshwater wetlands. *Earth System Science Data Discussions*, pp.1-111.

Walker, A.P., M.G. De Kauwe, A. Bastos, S. Belmecheri, K. Georgiou, R. Keeling, S.M. McMahon et al. (59 authors). 2020. Integrating the evidence for a terrestrial carbon sink caused by increasing atmospheric CO<sub>2</sub>. *New Phytologist*. doi: 10.1111/nph.16866

Pastorello, G., Trotta, C., Canfora, E. ...and D. Papale. The FLUXNET2015 dataset and the ONEFlux processing pipeline for eddy covariance data. *Sci Data* 7, 225 (2020). <https://doi.org/10.1038/s41597-020-0534-3>

- Lehmann, L., C.M. Hansel, C. Kaiser, M. Kleber, K. Maher, S. Manzoni, N. Nunan, M. Reichstein, J.P. Schimel, M.S. Torn, W.R. Wieder, I. Kögel-Knabner. 2020. Persistence of soil organic carbon caused by functional complexity. *Nature Geosciences* **13**: 529–534. <https://doi.org/10.1038/s41561-020-0612-3>
- Wang, Y., Yuan, F., Yuan, F., Gu, B., Hahn, M.S., Torn, M.S., Ricciuto, D.M., Kumar, J., He, L., Zona, D. and Lipson, D.A., 2019. Mechanistic Modeling of Microtopographic Impacts on CO<sub>2</sub> and CH<sub>4</sub> Fluxes in an Alaskan Tundra Ecosystem Using the CLM-Microbe Model. *Journal of Advances in Modeling Earth Systems*.
- Wagle, P., Gowda, P. H., Billesbach, D. P., Northup, B. K., Torn, M. S., Neel, J. P., & Biraud, S. C. (2020). Dynamics of CO<sub>2</sub> and H<sub>2</sub>O fluxes in Johnson grass in the US Southern Great Plains. *Science of The Total Environment*, 140077.
- Soong\*, J.L., L Fuchslueger, S Marañon-Jimenez, M.S Torn, I.A Janssens, J Penuelas, A. Richter. 2020. Microbial carbon limitation-the need for integrating microorganisms into our understanding of ecosystem carbon cycling. *Global Change Biology*. <https://doi.org/10.1111/gcb.14962>.
- Soong\*, J.L., C.L Phillips, C Ledna, C.D Koven, M.S Torn. 2019. CMIP5 models predict rapid and deep soil warming over the 21st century. *Journal of Geophysical Research: Biogeosciences*, <https://doi.org/10.1029/2019JG005266>.
- Hicks Pries\*, C, A Angert, C Castanha, B Hilman, M.S Torn. 2020. Using respiration quotients to track changing sources of soil respiration seasonally and with experimental warming. *Biogeosciences* **17**, 3045–3055, 2020. <https://doi.org/10.5194/bg-17-3045-2020>
- Knox, S.B., R.B Jackson, B Poulter, G McNicol, E Fluet-Chouinard, Z Zhang, et al. 2019. FLUXNET-CH<sub>4</sub> Synthesis activity: objectives, observations, and future directions. *Bulletin of the American Meteorological Society*. <https://doi.org/10.1175/BAMS-D-18-0268.1>
- Lawrence, C. R., Beem-Miller, J., Hoyt, A. M., Monroe, G., Sierra, C. A., Stoner, S., Heckman, K., Blankinship, J. C., Crow, S. E., McNicol, G., Trumbore, S., Levine, P. A., Vindušková, O., Todd-Brown, K., Rasmussen, C., Hicks Pries, C. E., Schädel, C., McFarlane, K., Doetterl, S., Hatté, C., He, Y., Treat, C., Harden, J. W., Torn, M. S., Estop-Aragonés, C., Asefaw Berhe, A., Keiluweit, M., Della Rosa Kuhnen, Á., Marin-Spiotta, E., Plante, A. F., Thompson, A., Shi, Z., Schimel, J. P., Vaughn, L. J. S., von Fromm, S. F., and Wagai, R.: An open-source database for the synthesis of soil radiocarbon data: International Soil Radiocarbon Database (ISRaD) version 1.0, *Earth Syst. Sci. Data*, **12**, 61–76, <https://doi.org/10.5194/essd-12-61-2020>, 2020.
- Lawrence, C.R. et al. International Soil Radiocarbon Database v1. 0. 2019.
- Vaughn\*, L.J.S. and M.S. Torn. 2019. <sup>14</sup>C Evidence that millennial and fast-cycling soil carbon are equally sensitive to warming. *Nature Climate Change*, **9**(6): 467-471.
- Grant, R.F., Z.A Mekonnen, W.J Riley, B Arora, M.S Torn. Modeling Climate Change Impacts on an Arctic Polygonal Tundra: 2. Changes in CO<sub>2</sub> and CH<sub>4</sub> exchange depend on rates of permafrost thaw as affected by changes in vegetation and drainage. *Journal of Geophysical Research. Biogeosciences*, 2019
- Keenan, T.F., M. Migliavacca, D. Papale, D. Baldocchi, M. Reichstein, M.S. Torn, T. Wutzler. 2019. Widespread inhibition of daytime ecosystem respiration, *Nature Ecology & Evolution*, **3** (3), 407-415.
- Vaughn\*, L.J.S. and M.S. Torn. 2018. Radiocarbon measurements of ecosystem respiration and soil pore-space CO<sub>2</sub> in Utqiaġvik (Barrow), Alaska. *Earth Syst. Sci. Data*, **10**, 1943-1957, 2018. <https://doi.org/10.5194/essd-10-1943-2018>
- Arora, B., Wainwright, H.M., Dwivedi, D., Vaughn, L.J., Curtis, J.B., Torn, M.S., Dafflon, B. and Hubbard, S.S. 2019. Evaluating temporal controls on greenhouse gas (GHG) fluxes in an Arctic tundra environment: An entropy-based approach, *Science of the Total Environment*, **649**, 284-299, DOI: 10.1016/j.scitotenv.2018.08.251.
- Abramoff\*, R.Z., M.S Torn, K Georgiou, J Tang, W.J Riley. 2019. Soil organic matter temperature sensitivity cannot be directly inferred from spatial gradients. *Global Biogeochemical Cycles*, **33** (6): 761-776.
- Hicks Pries\*, C.E., B.N. Sulman, C. West, C. O'Neill, E. Poppleton, R.C. Porras, C. Castanha, B. Zhu, D.B. Wiedemeier, and M.S.Torn. 2018. Root litter decomposition slows with soil depth. *Soil Biology and Biochemistry* **125**: 103-114. <https://doi.org/10.1016/j.soilbio.2018.07.002>
- Feldman, D.R., W.D. Collins, S.C. Biraud, M.D. Risser, D.D. Turner, P.J. Gero, J. Tadić, D. Helmig, S. Xie, E.J. Mlawer, T.R. Shippert, M.S. Torn. 2018. Observationally derived rise in methane surface forcing mediated by water vapour trends. *Nature Geoscience* **11**(4): 238-243. doi:10.1038/s41561-018-0085-9

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- Porras, R.C., C.E.H. Pries, M.S. Torn, P.S. Nico. 2018. Synthetic iron (hydr) oxide-glucose associations in subsurface soil: Effects on decomposability of mineral associated carbon. *Science of The Total Environment* 613, 342-351
- Hicks Pries\*, C.E., C. Castanha, R.C. Porras, C. Phillips, M.S. Torn. 2018. Response to Comment on “The whole-soil carbon flux in response to warming.” *Science* 359 (6378), eaao0457
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- Abramoff\*, R., X. Xu, M. Hartman, S. O’Brien, W. Feng, E. Davidson, A. Finzi, D. Moorhead, J. Schimel, M. Torn, M. A. Mayes. 2018. The Millennial model: in search of measurable pools and transformations for modeling soil carbon in the new century. *Biogeochemistry* 137(1-2): 51–71. <https://doi.org/10.1007/s10533-017-0409-7>
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- Georgiou\*, K., R.Z. Abramoff, J. Harte, W.J. Riley, M.S. Torn. 2018. Publisher Correction: Microbial community-level regulation explains soil carbon responses to long-term litter manipulations. *Nature communications* 9 (1), 173
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- Lu\*, Y., I.N. Williams, J.E. Bagley, M.S. Torn, and L.M. Kueppers. 2017. Representing winter wheat in the Community Land Model (version 4.5). *Geoscientific Model Development (Online)*, 10(5).
- Pastorello, G., D. Papale, H. Chu, C. Trotta, D. Agarwal, E. Canfora, D. Baldocchi, and M. Torn. 2017. A new data set to keep a sharper eye on land-air exchanges. *Eos*.
- Hicks Pries\*, C.E., C. Castanha, R. Porras, and M.S. Torn. 2017. The whole soil carbon flux in response to warming. *Science* 2017; eaal1319 DOI: [10.1126/science.aal1319](https://doi.org/10.1126/science.aal1319)
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- Raz-Yaseef\*, N., Torn, M.S., Wu, Y., Billesbach, D.P., Liljedahl, A.K., Kneafsey, T.J., Romanovsky, V.E., Cook, D.R. and Wullschlegel, S.D. 2017. Larger CO<sub>2</sub> and CH<sub>4</sub> emissions from polygonal tundra during spring thaw in northern Alaska. *Geophysical Research Letters*. Jan 10 2017, 10.1002/2016GL071220
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### **Books and Book Chapters**

- Anderegg, B, J. Freeman, R. Jacobson, and Margaret S. Torn. (2021) The Building Blocks of CDR Systems: Forest Carbon. *CDR Primer*, edited by J Wilcox, B Kolosz, J Freeman
- Belmont, E, D.L. Sanchez, P. Smith, and Margaret S. Torn. (2021) The Building Blocks of CDR Systems: Biochar. *CDR Primer*, edited by J Wilcox, B Kolosz, J Freeman
- Paustian, K, P. Smith, R. Jacobson, and M.S. Torn. (2021) The Building Blocks of CDR Systems: Soil Carbon. *CDR Primer*, edited by J Wilcox, B Kolosz, J Freeman
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### **Selected Non-Refereed Publications**

- Chambers, J.Q., C. Gorman, Y. Feng, M.S. Torn, J. Stapp. 2019. Rapid remote sensing assessment of landscape-scale impacts from the California Camp Fire. *PeerJ Preprints* 7, e27654v1
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- Kueppers, L., M.S. Torn, and J. Harte. 2007. Quantifying ecosystem feedbacks to climate change: observational needs and priorities. A report to the Office of Biological and Environmental Research, DOE
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- Barnes, F.J., S.M. Benson, and M.S. Torn, co-chairs. 2002. DOE Water Cycle Research Strategy. December 2001. U.S. Department of Energy, Office of Science, Office of Biological and Environmental Research. DOE-SC-0043
- Berner, R. and workshop participants. 2001. The Changing Carbon Cycle: A Terrestrial Focus. Report of the Workshop on the Terrestrial Carbon Cycle. Sponsored by The National Science Foundation, Division of Earth Sciences, June 3, 2000. Workshop Participants: Michael Bender, Robert Berner, Katherine H. Freeman, Chris Field, James Galloway, John Hedges, Lars O. Hedin, Fred Mackenzie, Claudia Mora, Joshua Schimel, William Schlesinger, Robert Stallard, Eric Sundquist, Margaret Torn, Steven C. Wofsy.
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- Torn, M.S. 1994. Environmental Controls over Methane Flux from Ecosystems and the Potential for Feedbacks with Climatic Change. Ph.D. Dissertation, University of California, Berkeley
- Torn, M.S. 1993. Global Warming and Upwelling Ecosystems. In: California Sea Grant: Biennial Report of Completed Projects, 1988-1990. California Sea Grant College, U.C. San Diego.
- Jensen, D.B., M.S. Torn, and J. Harte. 1991. In Our Own Hands: A strategy for conserving biological diversity in California. California Policy Seminar, Berkeley, CA. 220 pp
- Torn, M.S. 1990. The Threats to Biological Diversity in California. Masters Thesis, Energy and Resources Group, U.C. Berkeley. 65 pp
- Torn, M.S., J.E. DeGrange, and J.H. Shinn. 1988. The Effects of Acidic Deposition on Alberta Agriculture: A review. Acid Deposition Research Program. Calgary, Alberta. 160 pp

## **Selected Synergistic and Professional Activities**

2018, 2019 Clarivate Analytics Highly Cited Researcher, top 0.1% of global scientists.

Service to Berkeley Lab:

Division Professional Staff Committee 2015-Present

Climate and Ecosystem Sciences Division Council 2015-Present (ESD Division Council (2001–2015)

Program Domain Lead, Biosphere-Atmosphere Interactions, 2015-Present (was Program co-head, Climate and Carbon Sciences, 2003-2015)

Lab-wide recognition committee, 2014-2018

Scientist and Post doc search committees

Chair, Earth Sciences Division diversity committee, 2003-2006

Service to UC Berkeley:

ERG Curriculum committee 2015-Present

UCB ERG Executive Committee (2003–2005 as affiliate; 2006–Present as core member)

Mentor, President's post doctoral fellows, 2014-2016

Faculty Search Committee member, 2015-2016

Lead and PI, AmeriFlux Management Project, 2012-Present

PI: Belowground Biogeochemistry Scientific Focus Area (TES SFA), 2010-Present

PI: Land-Atmosphere Interactions, ASR, 2014-18; co-PI 2018-2021

Co-PI: Next Generation Ecosystem Experiment – Arctic, 2011-Present

Steering Committee, the UC Berkeley – Berkeley Lab Environmental Resilience Accelerator, 2018-present

President-elect, Biogeosciences Section, AGU, 2019-2010; Chair, AGU Union Fellows section nominating committee, 2019-2020.

Science Steering Group, International Soil Carbon Network, 2008-Present

Co-Chair, The Land-Energy Nexus in Climate Change Mitigation, a Low-Emissions Solutions Conference and official affiliated event of the Global Climate Action Summit (GCAS), University of San Francisco, CA, September 11, 2018

Invited participant, Workshop on Next Generation Soil Organic Matter Modeling, Burghausen, Germany, October 1-4, 2018.

Invited participant, ICOFEST, Biosphere2, Arizona, September 18-21 2018.

Guest-editor, AmeriFlux 20<sup>th</sup> Anniversary Issue, Agriculture and Forest Meteorology Journal, 2016-2017

Selected briefings in 2017: Climate and the Carbon Sink. Presentation to State Senator Stern, September 27, 2017; Carbon, Land, and Water in California. Presentation to the Strategic Growth Council. Berkeley Lab, November 27, 2017; Land Carbon Sequestration. presentation to Strategic Growth Council staff. Berkeley Lab, November 5, 2017

Selected briefings on the Carbon Sink in 2016: Sharlene Weatherwax (July 19), annual BER S&T presentation (Oct. 5), Tom Steyer (Aug 18); Sustainable solutions development network, IIASA, Austria (Oct 20)

Chair, AGU Town Hall on AmeriFlux, 2013, 2014, 2015, 2017, 2018, 2019; co-convener 2016.

Chair, AGU Town Hall on Negative Emissions Technologies, 2016

Co-organizer, FLUXNET international workshop, Berkeley, CA, June 2017

Co-organizer, Joint North American Carbon Program (NACP) – AmeriFlux Principle Investigators meeting, Washington DC, March 2017

Area team lead for USGCRP, Earth observation system (EOA) 2016

Co-organizer, International Year of Soil workshop, March 2016 (could not attend workshop)

Invited participant: Workshop to establish a Global Science and Data Network for Coastal Blue Carbon, Menlo Park, 2016. Presented observations from AmeriFlux perspective.

Co-organizer, 5<sup>th</sup> North American Carbon Program Principle Investigators meeting (PIM5) Washington DC, January 2015. Delivered one of two opening keynote talks.

Invited participant: Workshop on old soil organic matter, Hamburg, Germany, October 2015

Co-convener/Co-chair, AGU Union and Named Sessions:

Governor Jerry Brown in Conversations with AGU Scientists: Protecting Earth's Climate (U33C) 2019; The William S. and Carelyn Y. Reeburgh Lecture (B43L) 2019

Co-convener /Co-chair, AGU sessions (oral and poster):

Carbon, Water, and Energy Exchange in Grassland and Cropland Ecosystems, Fall Meeting 2004. Modeling and observation of ecosystem, carbon cycle and energy system feedbacks in the Earth's climate, Fall Meeting 2006. Soils: Mechanisms of Carbon Stabilization and Response to Climate Change, Fall Meeting 2007. Long-term networks for ecosystem GHGs fluxes: applications and development, Fall 2013. RePresenting soil carbon dynamics in global land models to improve future IPCC assessments, Fall 2014. Understanding the processes that affect soil organic matter decomposition by linking process-rich experiments and models, Fall 2014. Ideas in Terrestrial Biochemistry: Tell the Story, Ditch the PowerPoint, Fall 2014. Macrosystem Ecology: Thresholds in Ecological Processes and Response across Temporal and Spatial Scales, Fall 2015. 20 Years of Eddy Flux Research in AmeriFlux and EuroFlux: History, Highlights, and Future Directions, 2016. Advances and Opportunities in Forecasting and Data-Model Integration: Approaches for Reducing Complexity and Improving Predictive Understanding in Biogeochemical Models of the Earth System I, Fall 2017. Integration of Ecosystem Research Infrastructures for Multiscale Analysis, Fall 2017. Plant-Soil interactions under Global Warming: Learning Mechanisms from Multiyear Field Experiments and Natural Gradients. Fall 2018; Protecting Earth's Climate for the Next Centennial (GC067); Fall 2019.

Co-Chair or organizer, AmeriFlux Principal Investigators meeting, 2014-2016

Organizing Committee, Bouyoucos Conference on "A Path to Improved Understanding of Complex Soil Systems." Berkeley, Spring 2014

Co-organizer, Land-atmosphere interactions breakout session, ASR/ARM Science Team meeting 2014

Founding member, International Soil Experiment Network, 2013-Present

International Advisory Board, University Research Priority Program on 'Global Change and Biodiversity', University of Zurich, Switzerland, 2013-Present

Organizing committee with Alain Plante (Chair), Josh Schimel, and Anthony Aufdenkampe, SOM6, The Sixth International Workshop on Soil Organic Matter Stabilization and Destabilization, Kiawa Resort, SC, (was not able to attend) October 2014

User Working Group member, Carbon Dioxide Information Analysis Center (CDIAC), 2013

IPCC chapter lead for US government review (Chapter 26: North America), 2013

Co-convener with Ingrid Kögel-Knabner of Goldschmidt 2013 session 18b, Climate Change and SOM storage and decomposition. Florence, Italy, August 2013

Rapporteur: Moving wire analysis workshop, Lawrence Livermore National Lab, 9-10 Feb 2012

Co-organizer, DOE Workshop: Strategies to Promote Integrated Experiment-Model Approaches to Terrestrial Ecosystem Study, Washington DC, March 19-21, 2012

Lead Organizer, Terrestrial Radiocarbon Database international workshop, Berkeley, CA, July 20-21, 2011

Invited participant, NASA Carbon Monitoring System workshop. 13-14 July 2010 Boulder CO

Science Steering Group, North American Carbon Program (NACP) of the U.S. Global Change Research Group, 2005-2010

Planning meeting, the Carbon Summit, National Academies, January 28-29, 2009

Invited participant, DOE next generation ecosystem experiment, February 2009

Rapporteur, meeting on Arctic Tundra Deep Warming: a Possible DOE Next-Generation Climate Change Ecosystem Experiment, July 2009

Invited participant, JGI Soil metagenomics initiative meeting, July 2009

Invited participant, DOE-NSF Workshop on Coordinated Approaches to Address Long-Term Issues in Global Change Experiments, August 2009

Rapporteur and invited participant, The Lake Constance think tank on global change and feedback from organic carbon dynamics: Defining research visions on how to quantify the molecular-level mechanisms driving soil organic matter turnover, Ittingen, Switzerland, October 2009

Workshop participant, Exploring science needs for the next generation of climatic change and elevated CO<sub>2</sub> experiments in terrestrial ecosystems, Crystal City, VA, April 14-18, 2008

Invited participant, ARM Climate Research Facility Workshop Report, October 2008

Rapporteur, Gradients and Transects session, NACP PI meeting, January 25, 2007

Testified for California Air Resources Board to US EPA hearing on AB32 waiver, May 30, 2007

Convened workshop for Energy Biosciences Institute (EBI) on research needs for biologically enhanced carbon sequestration in terrestrial and geologic reservoirs. Co-convenor: Curt Oldenburg. Berkeley, October 29, 2007. Co-author of whitepaper to EBI.

Organizing committee and session chair, China-US Climate Change Conference, Berkeley, CA, May 2006

Advisory Board, Reviewer, Carbon Dioxide Information Analysis Center (CDIAC), 2005

Member, ARM Science Team, surface flux working group

Co-Chair, Continental Synthesis Task Force, Science Steering Group, (NACP), 2005

Contributing writer and reviewer, California Climate Change: Science Report to Governor on Impacts and Adaptation Options. Convened by California Energy Commission, EPA, and ARB, **2006**

National Technical Advisory Committee, DOE National Institute for Global Environmental Change, 2003-2005

Science advisor, Union of Concerned Scientists assessment of climate change and wildfire impacts in California, 2005

Invited participant, Interagency workshop on Ecosystem Chapter of the US Climate Change Science Plan, Spring, 2004

Invited participant and rapporteur, NSF NEON Biogeochemistry Workshop, Boulder, July 2004

Session leader, NSF-sponsored workshop on soil respiration: Carbon Respiration from Terrestrial Ecosystems (CaRTE), 2004

Lead Author, Road map for non-CO<sub>2</sub> greenhouse gas inventories in California, California Energy Commission. 2003-2004

Writing Team, Rapporteur, North American Carbon Program workshop & implementation plan, 2003

Co-Author, Review Chapter of California Energy Commission Climate Change Assessment, 2003

Co-author, white paper on Biogeosciences in NSF. White Paper title “Linking Ecological Biology and Geoscience. Report to the National Science Foundation, April 4, 2002”

Co-chair and author, DOE Water Cycle Dynamics and Prediction Program plan, 2001

Co-organizer NSF workshop for research in joint geosciences and biosciences. Madison, WI, 2001

Co-author NSF workshop on the Terrestrial Carbon Cycle, June 2000. White Paper title: “The changing carbon cycle: A terrestrial focus”

Co-author DOE Terrestrial Ecosystems Research Facilities white paper, 2000

Guest Instructor workshop on “Monitoring, Evaluation, Reporting, Verification and Certification of CO<sub>2</sub> Emissions,” LBNL Energy and Environmental Technologies Division, 2000

Invited Panelist California Energy Commission Workshop on Climate Change Science, June 1999

Co-author Agricultural and grassland ecosystems, appendix to “Working paper on carbon sequestration science and technology,” Office of Science and Office of Fossil Energy, DOE 1999

Interviewer, Switzer Environmental Fellowship

Interviewer, Compton Foundation Fellowship

Reviewer Atmospheric Environment, Biogeochemistry, Chemosphere, Climatic Change, Ecological Applications, Geoderma, Global Biogeochemical Cycles, Global Change Biology, Journal of Geophysical Research, Limnology and Oceanography, Nature, Oecologia, Soil Science Society of America Journal

Proposal Reviewer DOE, NSF, WESTGEC, EPA, EMSL

Proposal Panel Member DOE-TCP, DOE-NICCR

Mentor: ERULF, SULI, GREF, SCGSR, Pre-teacher training, and Mickey Leland programs

### **Courses Taught**

ERG Masters Seminar (ER292B, C, D). Co-convenor, Fall 2012, Spring 2013-2017. Convenor Spring 2019, 2020, 2021

Quantitative Aspects of Global Environmental Problems (Energy and Resources 102) University of California, Berkeley, Spring 2006, Spring 2009 (co-taught), Spring 2011

Climate Change Adaptation: policies, politics, and metrics (Energy and Resources 298), University of California, Berkeley, Spring 2010

Food Systems (Energy and Resources 298), University of California, Berkeley, Fall 2008, Spring 2009

Climate Change Impacts and Adaptation (Energy and Resources 290), University of California, Berkeley, Fall 2007, Fall 2008

Environmental Aspects of Biofuels (Energy and Resources 290N) University of California, Berkeley, Spring 2007

The Root-Ecosystem Interface. Co-taught with Todd Dawson. Department of Integrative Biology, University of California, Berkeley. Spring 2002. Course number: IB 250

Biogeochemistry: Carbon and Nitrogen Cycles (Environmental Science 320), Colorado College, Spring 1996.  
(*Visiting Professor*)

### **Other Teaching Experience**

Seminar Leader on Climate Change, Environmental Leadership Forum, UC Berkeley, July 13, 2011

Guest Lecturer:

Monterey Institute of International Studies, February 2008, October 2008, November 2009, October 2011  
UCB, ER201, Fall 2006-2013. PH268 Spring 2008-2010.

UC Merced, Fall 2009

UC Berkeley and UC Irvine, various courses, 1991-1994, 1995, 1999-2000

Stanford University, 1999

Guest Instructor, workshop on “Monitoring, evaluation, reporting, verification and certification of CO<sub>2</sub> emissions” organized by Ed Vine, LBNL Energy and Environmental Technologies Division, 2000

Lecturer Environmental and Cultural Aspects of Energy, Workshop for Native American College Instructor, Native American Renewable Energy Education Project, Summer 1996

Graduate student instructor, Quantitative Aspects of Global Environmental Problems (Energy and Resources 102) University of California, Berkeley, Spring 1987

### **Invited Presentations, 1999-2021**

Three Perspectives on the Global Carbon Cycle: Soil, Atmosphere, and Energy: BEST symposium, January 2021

The 2020 Benno P. Warkentin Lectureship, Oregon State University, Corvallis, OR, May 10, 2020. (postponed)

The large, deep, slow contribution of soils to future climate-ecosystem feedbacks. AAAS Meeting, Seattle, WA, February 16, 2020.

The Pivotal Role of Heterogeneity in the Persistence of Soil Organic Matter. AGU Fall Meeting, San Francisco, CA, December 12, 2019

Is it Getting Hot in Here? ModEx-ing soil warming. DOE ESS PI Meeting, Bolger Center, May 1, 2019.

Pathways to Deep Decarbonization in the United States, The Earth's Carbon Cycle in the 21st Century: Climate, Ecosystems, and Energy: A symposium honoring Susan Trumbore, Benjamin Franklin Medalist in Earth and Environmental Science, University of Delaware, Newark, DE, April 18, 2018.

Afforestation & Reforestation as negative emissions technologies. Environmental Defense Fund Science Day Fort Baker, Golden Gate National Recreation Area, January 30, 2018.

Pathways to Deep Decarbonization in the United States. Berkeley Lab Division Director's Meeting, Berkeley, CA, January 18, 2017

Ecological Aspects of Bio-Energy Production. Presented at the Workshop on Bio-Energy with Carbon Capture and Storage, convened by the National Academy of Sciences Committee on Developing a Research Agenda for Carbon Dioxide Removal and Reliable Sequestration, Irvine, CA, October 23, 2017.

BECCS: The Climate and Environmental Context (Torn and Sanchez) and Processes and Near-Term Opportunities (Sanchez and Torn). Presented to the WaferX kick-off meeting in Missoula, Montana, via Zoom, October 11, 2017.

Soils and the Global Carbon Cycle, Princeton University, Princeton, NJ, September 19, 2017

North American Flux Networks, Fluxnet Workshop, Berkeley, CA, June 7 2017

Three Perspectives on the Global Carbon Cycle: Soil, Atmosphere, and Energy, at the 20th Annual Environmental Chemistry and Microbiology Student Symposium, Penn State University, April 21, 2017

In the Arctic, Gallery opening for Paul Nicklen, Polar Obsession, Brower Center, Berkeley, February 16, 2017

Ecological aspects of large-scale bioenergy with CCS (BECCS); Carbon Dioxide Removal/Negative Emissions Technologies Workshop, Berkeley CA, Feb 8, 2017



Panelist: Climate smart agriculture, Low Emissions Solutions Conference, COP22, Marrakech, November 14-16, 2016

The Urgent Need to Predict, Protect, and Enhance the Global Carbon Sink, Global Change and Biodiversity: Integrating Mechanisms of Interactions, Feedbacks and Scale: URPP Global Change and Biodiversity Conference, Monte Verità Conference Center, Ascona, Switzerland, 28 August – 01 September 2016.

Enhancing the Global Carbon Sink, Big Ideas Summit, Washington DC, April 22, 2016

Invited panelist, Philomathia Forum, UC Berkeley, February 18, 2016

Invited panelist, The Most Urgent Untold Environmental Stories of Our Time, Switzer Fellows as scientists and leaders presenting their work. Wild and Scenic Film Festival, Nevada City, January 16, 2016

Climate warming and soil carbon cycling: Emergent responses across time and space. Ecological Society of America meeting. August 10, 2015

News from a whole-profile soil warming experiment. Margaret Torn and TES SFA team. ESS PI Meeting, Potomac, MD, April 29, 2015

Three Perspectives on the Global Carbon Cycle: Soil, Atmosphere, and Energy. University of Zurich, Zurich. April 24, 2015

DOE NGEE – Arctic Land-Atmosphere Interactions. Margaret Torn and the NGEE Arctic Team. ARM/ASR Joint PI Meeting. Vienna, VA, March 18, 2015

Natural and Working Lands in California’s future GHG balance. Advancing Natural and Working Lands to Achieve California’s Climate Goals, Sacramento, CA, February 25, 2016.

The Implications of Deep Reductions in Greenhouse Gas Emissions for Carbon Cycle Science. Margaret Torn, Andy Jones, Jim Williams, Ben Haley, Jack Moore. Keynote speaker for North American Carbon Program, Washington, DC. January 26, 2015

Ecological Limits to Terrestrial Carbon Dioxide Removal. Margaret Torn, L Smith, D. Sanchez, U Mishra, J Williams. AGU Fall Meeting, San Francisco, CA, December 16, 2014

The Effect of a Warmer Climate on Soil Carbon Cycling: Emergent responses across time and space scales. Margaret Torn, TES SFA team (Caitlin Hicks Pries, Biao Zhu, Claire Phillips, et al.), NGEE-Arctic team (Baptiste Dafflon, Lydia Smith, Susan Hubbard et al.), and iSEN team. Soil Science Society of America (SSSA) meeting, Long Beach, CA, November 3, 2014

DOE Next Generation Ecosystem Experiments: a tale of two NGEEs. LBNL Biosciences Retreat. Doubletree Marina. October 28, 2014

Invited panelist “Panel Discussion Session” on the future directions and international efforts. Complex Soil Systems Conference, Berkeley, Sept 3-5, 2014

The Effect of a Warmer Climate on Soil Carbon Cycling: Emergent responses across time and space scales. Jennifer Harden and Margaret Torn. Complex Soil Systems Conference, Berkeley, Sept 3-5, 2014

The International soil experiment network. Margaret Torn and Jennifer Harden. Complex Soil Systems Conference, Berkeley, Sept 3-5, 2014

Looking a little deeper: A new experiment warming forest soil to 1 m deep. Margaret Torn, Caitlin Hicks Pries, Biao Zhu Eoin Brodie, Peter Nico, Bill Riley, Neslihan Tas, and Claire Phillips. Ecological Society of America, Sacramento, CA. August 12, 2014

Process understanding on soil dynamics along the vertical profile, presented at the NSF RCN workshop on Representing soil carbon dynamics in global land models to improve future IPCC assessments, Breckenridge, CO. June 12, 2014

Mysteries of the deep: soil response to climate change. Kaplan Workshop on Biogeochemistry, Sdot Yam, Israel. May 27, 2014

Soil warming and the vulnerability of old soil organic carbon. DOE SBR/TES PI Meeting, Bolger Center, Bethesda, MD, May 14, 2013

Connecting soil organic matter residence time with SOM molecular structure. EMSL session of the TES/SBR PI Meeting, Potomac, MD, May 6, 2014

Opening talk at the AmeriFlux PI meeting, Potomac, MD, May 5, 2014

What happens to Earth's climate when the permafrost thaws? Science in the Theater. Berkeley, CA. April 22, 2013

Carbon – Ecosystems – Climate, and Technology path to deep greenhouse gas reductions by 2050. University of Zurich, Zurich, Switzerland. April 15, 2013

Pathways to 2050: Modeling a Low-Carbon Future. United Nations Sustainable Development Solutions Network. New York City, NY. April 9, 2013. (co-presented with Jim Williams)

The Terrestrial Carbon Cycle: Implications for Climate Feedbacks and Mitigation. Life Sciences Seminar, Life Sciences Division, Berkeley Lab. January 8, 2013

A radiocarbon database for improving understanding of global soil carbon dynamics (with L. Smith, S.E. Trumbore, J. Harden, T. Baisden, L. Nave, and D. Agarwal). AGU Fall Meeting, San Francisco, CA, December 7, 2012

Two Aspects of Soils in Global Change: Challenges for models. SOM-5 Unifying concepts of organic matter (de-)stabilization in terrestrial and aquatic systems. Ascona, Switzerland. October 9, 2012

Terrestrial Ecosystem Science SFA. Environmental Microbiology Program, Berkeley Lab. September 5, 2012

Linking new process understanding with Ecosystem carbon models. Terrestrial Ecosystem Science PI meeting, Washington, DC, April 24, 2012

Integrating mechanisms into soil carbon models for global simulations. Invited presentation at AGU Fall Meeting, San Francisco, CA, December 15, 2011

Secrets of the Soil, Science at the Theater series, Berkeley Repertory Theater, Berkeley California, November 7, 2011

Soil carbon dynamics in a changing world: Shifting paradigms? Soil Science Zvieri, University of Zurich, Sept 29, 2011

Soil carbon dynamics in a changing world: Shifting paradigms? SOM 2010, Hyères, France, September 22, 2011

Trees in Mountain Alpine Zones? And other potential warming impacts & mitigations. Barrow Arctic Research Center. August 20, 2011

Video Interview about NGEE in Barrow, Alaska, August 19, 2011, <http://youtu.be/KIvUXoqC9g4>

Teacher at international Environmental Leadership Forum, July 13, 2011

Sit down with Sabin, July 6, 2011: <http://www.youtube.com/BerkeleyLab#p/a/u/0/QTvYAsG2RVE>

Terrestrial Carbon Dioxide Removal: Ecological Limits and Impacts. Modeling and Policy of CO<sub>2</sub> Removal from the Atmosphere, International Center for Climate Governance, Venice, Italy, May 30-31, 2011 (Margaret Torn, Lydia Smith, and Andy Jones)

Empirical perspective: Soil Carbon Cycle. INTERFACE Workshop, Captiva Island, FL, March 2, 2011

Carbon Cycling in Terrestrial Ecosystems Research Challenges and Opportunities. Department of Energy Subsurface Biogeochemical Research workshop, Washington, DC, March 28-31, 2010

Isotopic Disequilibria in <sup>13</sup>CO<sub>2</sub> fluxes in the U.S. Southern Great Plains. Invited presentation at AGU Fall Meeting, San Francisco, CA, December 18, 2009

Global change and feedback from organic carbon dynamics: Defining research visions on how to quantify the molecular-level mechanisms driving soil organic matter turnover. Soil Science Zvieri, University of Zurich, October 7, 2009

Climate Change Science and GHG Emissions Reduction Modeling. European Commission's Learning and Development Unit, Brussels, Belgium. September 29, 2009. (Presented by Jim Williams)

Workshop Presentations for Department of Energy and presentations for the Berkeley Lab Directorate, various dates in 2009

Soil Carbon Vulnerability and Black Carbon Stability. Invited presentation at AGU Fall Meeting, San Francisco, CA, December 16, 2008

The Direct Effects of land use and land cover change for Biofuels. Workshop on Measuring and Modeling the Lifecycle GHG Impacts of Transportation Fuels. EDF-ERG-EBI. Berkeley, CA, July 1-2, 2008

Effects of erosion on CO<sub>2</sub> and N<sub>2</sub>O fluxes accompanying land use change. Greenhouse Gas Emissions from Biofuels Workshop, Berkeley, CA, June 9-10, 2008. Sponsored by EBI

Mission and Discovery: Big Science and Little Science at a National Laboratory. Invited talk for the German-American Conference on Organization, Research Management, and Science Policy, How Do We Know What We Know about Climate Change? University of California, Berkeley, April 24-26, 2008

Ecosystem feedbacks in the climate system and the role of soils. Environmental Engineering Seminar, University of California, Berkeley, February 29, 2008

CLASIC Carbon Air. The CLASIC workshop. March 26-27, Norman, Oklahoma, 2008

Linking the Response of Annual Grasslands to Warming and Altered Rainfall Across Scales of Gene Expression, Species, and Ecosystem, invited presentation at AGU Fall Meeting, San Francisco, CA, December 14, 2007

Annual Grassland Response to Altered Precipitation and Temperature: genes, species, and ecosystem, invited talk in "Ecosystem responses to experimental warming and other global climate change factors," Ecological Society of America annual meeting, San Jose, CA, August 8, 2007

Isotope research opportunities, FACE Workshop, Oak Ridge, TN, June 6, 2007

Ecosystem-Climate Interactions, Poster and flash slide presentation, German American Frontiers of Science, Kavli Frontiers of Science, National Academy of Sciences, Irvine, CA, June 1, 2007

Speaker at Earth Day rally on Sproul Plaza, UC Berkeley, April 20, 2007

Belowground Carbon Cycling and Root Modeling, Enriched Background Isotope Study workshop, New Orleans, LA, April 12, 2007

Climate Change: In your lifetime. Presented to the American Junior Academy of Sciences, Lawrence Berkeley National Laboratory, February 15, 2007

The Risk of Climate Change: What it Means for California. First Friday Forum, Lafayette, California February 2, 2007

Asymmetries in Climate Change Feedbacks: Why the Future may be Hotter Than you Think. AGU Fall Meeting, San Francisco, CA, December 12, 2006

From Mechanisms to Models. Final talk for the Second International Conference on Mechanisms of Soil Organic Matter Stabilization. Asilomar, CA, October 13, 2006

Climate Change: Facing the Impacts Now. Santa Rosa Jr College, Arts and Lectures Series. Santa Rosa, CA, October 11, 2006

TCP Soil Carbon Research, for the DOE/BER (BERAC) Carbon Cycle Research Review, Washington DC, Oct 4-6 2006, with contributions from J. Jastrow, R. Matamala, E. Paul, S. Morris, C. Garten, and P. Hanson

Regional Analysis: ARM, for the DOE/BER (BERAC) Carbon Cycle Research Review, Washington DC, Oct 4-6 2006

Climate Change Feedbacks and the Future Role of Soils. USGS Western Colloquium. Menlo Park, CA, August 14, 2006

Local Impacts of Global Warming, Presented to representatives from Alameda county and all its cities for the ICLEI Alameda Kickoff, Berkeley, CA, June 15, 2006

Next Generation Soil Carbon Models: Lessons from Isotopic Studies. Keynote address for the German Soil Priority Program 1090, Mechanisms of Soil Organic Matter Stabilization. Thurnau, Germany, March 21, 2006

Are roots the source of all soil organic matter? Results from isotopic experiments in two temperate forests, AGU Fall meeting, San Francisco, 2005

Women in Science. Panel discussion for Girls, Inc Alameda, Women of the 21<sup>st</sup> Century Club. Alameda, CA, July 19, 2005

An Annual Grassland Exploration of Scaling from Genomes to Ecosystem Function. Program for Ecosystem Research Workshop, Flagstaff, AZ, April 12, 2005

Climate-Ecosystem Feedbacks: Observational Needs and Opportunities: A scoping project for the US Climate Change Science Program. Program for Ecosystem Research Workshop, Flagstaff, AZ, April 12, 2005

EBIS Microbial Carbon Cycling rates and substrates. Enriched Background Isotope Study Workshop, Livermore, CA, January 20, 2005

Modeling wildfire and changing climates. Fire Ecology Seminar. University of California, Berkeley. September 2004

Soil Carbon Dynamics in Two Novel Cases: The Historic Russian Archives and the Tennessee Burp. Informal Seminar. University of Zurich, Switzerland. May 2004

Climate Change: Bringing it Back Home. Berkeley Lab Friends of Science Lecture Series. Berkeley City Main Library, April 26, 2004

Biotic and biogeochemical feedbacks to climate change. AGU fall meeting, San Francisco, CA, December 2002. Presented by John Harte

Applications of Radiocarbon to Terrestrial Carbon Research. Martin Luther University, April 30, 2002, Halle, Germany

Mineral control of carbon storage in Andisols: Case studies and applications to other soils. European Union workshop. COST ACTION 622: "Soil Resources of European Volcanic Systems" Manderscheid, Germany, April 24-28, 2002. \*Keynote address

Historic Russian Soil Collection Soil Carbon in the Russian Steppe. Workshop on Mechanisms of Soil Carbon Storage, UC Santa Barbara, December 3-4, 2001

Quantifying the Importance of Belowground Plant Allocation for Sequestration of Carbon in Soil. DOE Science Team Meeting, Argonne National Laboratory, IL. October 29-31, 2001

Using  $^{13}\text{C}$  and  $^{14}\text{C}$  in Elevated  $\text{CO}_2$  Experiments to Understand Soil Carbon Cycling in Grasslands. Workshop on Mechanisms of Soil Carbon Storage, UC Santa Barbara, December 3-4, 2001

Using  $^{13}\text{C}$  and  $^{14}\text{C}$  in Elevated  $\text{CO}_2$  Experiments to Understand Soil Carbon Cycling and Microbial Activity in Grassland. Isotopes in Ecology and the Earth Sciences at UC Berkeley; Berkeley Center for Stable Isotope Biogeochemistry, Berkeley, CA, August 2000

Ecological Complexity and Climate Change; California Energy Commission Workshop on Climate Change Science, Sacramento, CA, June 1999

Mineral Control of Soil Organic Matter Storage and Turnover. Center for Accelerator Mass Spectrometry Seminar Series, Lawrence Livermore National Laboratory, 1999

**Youtube Videos and Selected Press (This section is under construction!):**

Governor Jerry Brown in Conversation with AGU Scientists: Protecting Earth's Climate. Dec 11, 2019. [https://www.youtube.com/watch?v=H\\_TK-UDQeJg&t=164s](https://www.youtube.com/watch?v=H_TK-UDQeJg&t=164s)

AGU Lightning Talks III: Future Climate. Dec 10, 2019. <https://www.youtube.com/watch?v=5vC6yCgYCTc&t=23s>

Terrestrial CDR: Ecological Limits and Impacts. May 30, 2011. [https://www.youtube.com/watch?v=nZW\\_o6NE\\_tE](https://www.youtube.com/watch?v=nZW_o6NE_tE)

Science at the Theater - How Hot Will It Get? April 22 2013. <https://www.youtube.com/watch?v=JcXEEK9RCEE>

Science at the Theater: Secrets of the Soil. Nov 11, 2011. <https://www.youtube.com/watch?v=DAPotvk0sfc>

The Carbon Cycle with Margaret Torn. October 13, 2011. <https://www.youtube.com/watch?v=QTatW9rslrA>

Sit Down with Sabin: Margaret Torn: The Carbon Cycle Like You've Never Seen It. Jul 7, 2011 <https://www.youtube.com/watch?v=QTvYAsG2RVE>

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**Thesis Advisors:**

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**Serve(d) as reader, mentor, and/or collaborator for graduate students:**

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**Mentored Undergraduate, High School, and Teacher Interns (with name of Mentorship Program), in chronological order:**

Diane Kenski (ERULF), Pallavi Shukla (Mickey Leland), Erin Hanlon (Science Undergraduate Laboratory Internship, SULI), Braulia Sapien (Pre-Service Teacher Training, PST), Laura Wells (PST), Laura Huppert (Piedmont High School; Winner, Regional Science Fair and Intel International Science Fair in March 2005 with our project); Francesca Mia Hopkins (Environmental Science Senior Thesis, UCB; then Earth Sciences Division post baccalaureate fellow), Amy Morris (PST); Ryan Smith (PST); Alec Boyd; Chris Denn; Rachel Porras (SULI); Lynn Murphy (DOE Academy for Creating Teacher Scientists); Palermo Cuartero (Community College Initiative, CCI), Alfredo Hernandez (Community College Initiative); Kai Orans (Piedmont High), Rebecca Callahan (GCEP SURE), Julia Siegrist (Zurich), Caitlin O'Neill (SULI), Julia Gratton (Whitman College); Theodore Yassa (Berwick Academy, High School)

**Professional Affiliations**

American Geophysical Union  
Ecological Society of America