

# Asmeret Asefaw Berhe

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Earth and Planetary Sciences, University of California, Berkeley • 307 McCone Hall # 4767 • Berkeley, CA 94720-4767  
Phone (510) 967-7196 • Fax (510) 643-9980 • E-mail: AABerhe@berkeley.edu • Web <http://eps.berkeley.edu/~aaberhe>

## EDUCATION

<b>University of California, Berkeley.</b> Ph.D. in Environmental Science, Policy and Management (Biogeochemistry) Prof. John Harte, Dr. Jennifer W. Harden and Dr. Margaret S. Torn, advisors.	2006
<b>Michigan State University.</b> M.Sc. in Resource Development (Political Ecology)	2000
<b>University of Asmara.</b> B.Sc. in Soil and Water Conservation (top 2% of class)	1996

## PROFESSIONAL EXPERIENCE

Presidents Postdoctoral Fellow, Prof. Johan Six advisor. Department of Plant Sciences, <b>University of California, Davis</b> Dynamics of deep soil organic matter and its influence on dissolved organic matter chemistry and surface CO <sub>2</sub> flux. Prof. Jillian F. Banfield advisor. Department of Earth and Planetary Sciences, <b>University of California, Berkeley</b> Role of changing amount and seasonality of rainfall on stock and biochemical composition of soil organic matter; and effect of iron oxide size and concentration on stabilization and destabilization of organic carbon.	2006-Present
Graduate Student Researcher, Department of Environmental Science, Policy, and Management, <b>University of California, Berkeley</b> Role of soil erosion in terrestrial carbon sequestration – <i>in situ</i> and <i>ex situ</i> rates of organic matter decomposition; and mechanisms of organic matter stabilization; agro-pastoral practices of the Ittu-Oromo tribe in Ethiopia, geological prospects of oil exploration in the Horn of Africa.	2000-2006
Guest Researcher, Geological Division, <b>US Geological Survey, Menlo Park, CA</b> Storage and stabilization of organic carbon in a lacustrine environment	2002-2006
Graduate Student and Guest Researcher, <b>Lawrence Berkeley National Laboratory</b> Comparing effect of changing land use on soil carbon dynamics in modern and archived (100 yr) soils from the Russian Black Soil Belt; and effect of soiling on energy efficiency of roofing membranes	2001-2005
Research Assistant, Department of Resource Development <b>Michigan State University</b> Contribution of landmines to land degradation	2000

## COMPETITIVE AWARDS, FELLOWSHIPS, AND HONORS

University of California President's Postdoctoral Fellowship (\$ 80,000)	2006-2009
NASA Earth System Science Graduate Fellowship (\$ 72,000)	2003-2006
Young Fellow, Millennium Ecosystem Assessment	2002-2005
Zayed Environmental Prize (co-recipient of \$ 300,000 award for work in the Millennium Ecosystem Assessment)	2005
Fellow, University of California Institute for Preparing Future Faculty	2005
Carolyn Meek Memorial Fellowship (Soil Science), UC Berkeley (\$ 14,000)	2003-2004
Chancellor's Predoctoral Fellowship, UC Berkeley (\$ 84,000)	2000-2003, 2005
College of Agri. & Nat. Resources Scholarship, Michigan State University (\$ 1,000)	1999-2000
Graduate Opportunity Fellowship, Michigan State University (\$ 3,000)	1999-2001

## GRANTS

- US Department of Agriculture, CSREES, NRI Soil Processes Program Grant . Reactivity, Aggregation and Transport of Nanocrystalline Sesquioxides in the Soil System. P.I. A.A. Berhe (\$ 123,000). 2007-2009
- User Grant. Environmental Molecular Sciences Lab, Pacific Northwest National Laboratory. Effect of Increasing rainfall and temperature on molecular architecture of soil organic matter. (Use of 300Hz NMR spectrometer for five weeks) . P.I. A.A. Berhe, Co-PIs M. Waldrop and J.F. Banfield 2007-2008
- Regents Fellowship, University of California - Travel Grants (\$ 3,450) 2001,02,03,05,06
- US Department of Agriculture, NRI Soils and Soil Biology Program Grant . Stability and Loss Potential of Buried Soil Organic Carbon. P.I. J. Harte; Lead Author A.A. Berhe (\$ 310,000). 2003-2006
- NSF Travel grant, Frontiers in Exploration of the Critical Zone meeting (\$ 500) 2005
- User Grant. Environmental Molecular Sciences Lab, PNNL. Stabilization of soil organic matter: land use, erosion and burial (Use of 300Hz and 500Hz NMR spectrometers for five weeks). P.I. M.S. Torn, Co-PIs A.A. Berhe and E. Marín-Spiotta 2004
- National Park Service, Coastal Research Grant.. Stability and Loss of Buried Soil Organic Carbon in a Depositional Toposequence on a Coastal Watershed in Tennessee Valley, CA.. P.I. A.A. Berhe (\$ 1,000) 2003-2004
- International Campaign to Ban Landmines, Landmine Monitor Research Grant (Socio-economic and Ecological Reproussions of the Global Landmine Crisis, the Eritrean Case). P.I. A.A. Berhe (\$ 4,200) 1999-2000

## TEACHING EXPERIENCE

- Graduate Student Instructor, UC Berkeley 2002-2004  
Biosphere, - Fall '04, with Profs. Jill Banfield and Andrew Gutierrez  
Quantitative Aspects of Global Environment - Spring '03, with Prof. John Harte and Dr. Jim Williams  
Environmental Biology - Fall '03, with Prof. Ignacio Chapella  
Oceanography - Fall '02, with Profs. Lynn Ingrham and Thomas Powell
- Instructor, Michigan State University (Tigrigna, Eritrean) 1998-2000
- High School Teacher, Barka Comprehensive Secondary School, Asmara (English) 1993-1994

## OTHER PROFESSIONAL TRAINING

- Molecular Geomicrobiology: From Genomes to Ecosystems, UC Berkeley 2005
- Use of Radiocarbon in Ecology and Earth System Science, UC Irvine 2005
- Institute for Preparing Future Faculty, UC Berkeley 2005
- Stable Isotope Ecology summer short course and Laboratory, Uni. of Utah 2004

## PUBLICATIONS

- Berhe, A. A.**, Harden, J., Torn, M.S., Harte, J. (Accepted). Role of Landform Position in Erosion-Induced Terrestrial Carbon Sequestration. *Journal of Geophysical Research - Biogeosciences*.
- Harden, J.W., **Berhe, A.A.**, Torn, M.S., Harte, J., Liu, S., Stallard, R.F. 2008. Soil Erosion: Data Say C Sink (Technical Comment). *Science*. 320(5873): 178 - 179.
- Berhe, A.A.** and Ghezzehei, T.A. 2008. Biogeochemical Feedbacks. *Encyclopedia of Global Warming and Climate Change*. S. G. Philander (Ed). Sage Publishers.
- Berhe, A.A.** and Ghezzehei, T.A. 2008. Climate Data - Sediment Records. *Encyclopedia of Global Warming and Climate Change*. S. G. Philander (Ed). Sage Publishers.
- Berhe, A.A.**, Harte J., Harden, J. W., Torn, M.S. 2007. The Significance of the Erosion Induced Terrestrial Carbon Sink. *Bioscience*. 57(4):337-346.
- Berhe, A.A.** 2007. The Contribution of Landmines to Land Degradation. *Land Degradation and Development*. 18: 1-15

- Nelson, G., Bennett, E., **Berhe, A.A.**, Cassman, K., DeFries, R., Dietz, T., Dobermann, A., Dobson, A., Janetos, A., Levy, M., Marco, D., Nakicenovic, N., O'Neill, B., Norgaard, R., Petschel-Held, G., Ojima, D., Pingali, P., Watson, R., Zurek, M. 2006. Anthropogenic Drivers of Ecosystem Change: An Overview. *Ecology and Society*. 11(2): 32. **INVITED**.
- Berhe, A. A.**, Harden, J. W., Harte, J., Torn, M.S. 2006. Soil Degradation and Global Change: The role of soil erosion and deposition in carbon sequestration. University of California International and Area Studies. Breslauer Symposium. Paper 2. <http://repositories.cdlib.org/ucias/breslauer/2>.
- Akbari, H., **Berhe, A. A.**, Levinson, R., Graveline, S., Foley, K., Delgado, A. H., Paroli, R. M. Aging and weathering of cool roofing membranes. 2006. *Proceedings of the First International Conference on Passive and Low Energy Cooling for the Built Environment*. May 17, 2005, Athens, Greece. Also published as Lawrence Berkeley National Lab. Report, LBNL-58055.
- Levinson, R., Berdhal, P., **Berhe, A.A.**, Akbari, H.. 2005. Effect of Soiling and Cleaning on the Reflectance and Solar Heat Gain of a White Roofing Membrane. *Atmospheric Environment*, 39(40):7807-7824.
- Berhe, A.A.** 2005. Politicizing Indiscriminate Terror: Imagining an Inclusive Framework for the Anti-Landmines Movement. *Journal of Environment and Development*, 14: 375-393.
- Lavelle, P., Dugdale, R., Scholes, R., **Berhe, A.A.**, Carpenter, E., Codispoti, L., Izac, A.-M., Lemoalle, J., Luizao, F., Scholes, M., Tréguer, P., Ward, B.. 2005. Chapter 12 - *Nutrient Cycling*. In R. Hassan, et al., eds. *Ecosystems and Human Well-being: Current State and Trends, Volume 1. Findings of the Condition and Trends Working Group of the Millennium Ecosystem Assessment*. Island Press.
- Nelson, G.C., Bennett, E., **Berhe, A.A.**, Cassman, K.G., DeFries, R., Dietz, T., Dobson, A., Dobermann, A., Janetos, A., Levy, M., Marco, D., Nakic'enovic', N., O'Neill, B., Norgaard, R., Petschel-Held, G., Ojima, D., Pingali, P., Watson, R., Zurek, M. 2005. Chapter 7 - *Drivers of Change in Ecosystem Condition and Services*. In S. R. Carpenter, et al., eds. *Ecosystems and Human Well-being: Scenarios, Volume 2. Findings of the Scenarios Working Group of the Millennium Ecosystem Assessment*. Island Press.
- Berhe, A.A.** 2004. Of Land and Identity: Territorialization of the Eritrean National Identity. *Eritrean Studies Review*, 4 (1): 55-82.
- Berhe, A.A.** 2000. Eritrea. *Landmine Monitor Report 2000: Towards a Mine Free World*, pp. 209-211. International Campaign to Ban Landmines.

## MANUSCRIPTS IN REVIEW AND PREPARATION

\*Available upon request

- \*Green, E.G., Taunton, A. E., Welch, S. A., **Berhe, A.A.**, Banfield, J.F. Chemical Weathering Across a Retreating Escarpment. Submitted.
- \***Berhe, A. A.**, Torn, M.S., Harden, J., Harte, J., Effect of Landform Position, Burial, and Mesh Litterbags on Decomposition of Labile and Recalcitrant Organic Matter. Submitted.
- \***Berhe, A. A.**, Torn, M.S., Harden, J., Kleber, M., Burton, S.D., Harte, J. Physical, Chemical, and Biochemical Mechanisms of Eroded Soil Organic Matter Stabilization in two types of Depositional Basins. In Revision.
- \***Berhe, A.A.**, Fuller, C.C., Harden, J.W., Miller, L.G., Young, R. Terrestrial Sedimentation and Carbon Storage in Impoundments: The Case of Searsville Reservoir, California. In Revision.
- Lapenis, A, Torn, M.S., Ratigliano, A., **Berhe, A. A.** Comparisons of Carbon and Nitrogen Dynamics in Modern and 100-year old archived soils of the Russian Black Soil Belt. In Prep.
- Ghezzehei, T.A., **Berhe, A. A.**, Harte, J., Torn, M.S., Harden, J. Temporal Evolution of the Erosion Induced Terrestrial Carbon Sink. In Prep.
- Berhe, A.A.**, Suttle, K.B., and J.F. Banfield. Response of Soil Organic Matter and Base Cations to Anticipated Changes in Amount and Seasonality of Rainfall. In Prep.

## THESES

- Berhe, A. A.** 2006. Storage, Replacement, Stabilization, and Destabilization of Soil Organic Carbon in Eroding and Depositional Settings. *University of California, Berkeley* (Department of Environmental Science, Policy and Management), Berkeley, California. 242p.
- Berhe, A. A.** 2000. Landmines and Land Degradation: A Regional Political Ecology Perspective on the Impacts of Landmines on Environment and Development in the Developing World (Unpublished

Thesis). *Michigan State University* (Department of Resource Development), East Lansing, Michigan, 2000.

Mesfin, A., **Berhe, A. A.**, Weldezghi, A.. 1996. The Effect of Vegetal Cover on Soil Erosion (Honors Thesis). *University of Asmara* (Department of Soil and Water Conservation), Asmara, Eritrea, 1996.

## INVITED TALKS

The Upside of Erosion: Global Change Implications of Soil Degradation. *School of Natural Sciences, University of California, Merced*. April 3, 2008.

Significance of Soil Erosion for Terrestrial Carbon Sequestration. *Energy and Resources Group, University of California, Berkeley*. February 20, 2008.

Contribution of Soil Erosion to Atmospheric Carbon Dioxide Balance. *School of Natural Sciences, University of California, Merced*. October 31, 2007.

Global Climate Change. *Science and Math Seminar day, The French American International High School. San Francisco, California*. March 8, 2007.

Coupling Geomorphic and Ecosystem Processes: How Soil Erosion Regulates Carbon Sequestration. *Geography Department, University of California, Santa Barbara*. March 1, 2007.

Decomposition of Soil Organic Matter Along a Toposequence. *Department of Earth and Environmental Sciences, Lehigh University*. February 16, 2007.

Geomorphic Controls on Soil Organic Carbon Stability and Mechanisms of Stabilization. *Department of Earth Sciences, Rice University*. February 1, 2007.

## CONFERENCE PRESENTATIONS

**Berhe, A. A.**, and Banfield, J.F. Effect of changes in amount and seasonality of rainfall on soil carbon and cation nutrient composition.. *ASA-CSSA-SSSA 72<sup>st</sup> Annual Meeting, Houston, TX, October 5-9, 2008* (forthcoming).

Waldrop, M.P., Wickland, K., **Berhe, A. A.**, Harden, J.W., Striegl, R.G., and Aiken, G. Molecular investigations into a globally important carbon pool: permafrost-protected carbon in Alaskan soils. *AGU Fall Meeting, December 10-14, 2007*.

**Berhe, A. A.**, and Banfield, J.F.. Effect of iron oxide concentration on the amount and quality of sorbed organic matter. *ASA-CSSA-SSSA 71<sup>st</sup> Annual Meeting, New Orleans, LA. November 4-6, 2007*.

**Berhe, A. A.**, and Banfield, J.F. Concentration dependent effects of organic matter storage and stabilization by iron oxides. *Third International Conference on Mechanisms of Organic Matter Stabilization and Destabilization in Soils. September 23-26, 2007. Adelaide, Australia*.

K. Cruz, Suttle, K.B., **Berhe, A.A.**, Banfield, J. F. Rainfall variation impact above- and below-ground biota and soil biogeochemistry in the Eel River watershed. *National Center for Earth Surface Dynamics Site Visit, June 12-13, 2007. Minneapolis, MN*

**Berhe, A. A.**, Harden, J. W., Torn, M.S., Burton, S.D., Kleber, M., Harte J. Potentially Labile Soil Organic Carbon in Erosional and Depositional Settings of an Undisturbed Zero-order Watershed. *AGU Fall Meeting, December 11-15, 2006* .

Harden, J.W. van Oost, K., Neff, J., **Berhe, A.A.**, Rosenbloom, N., Schimel, D. Soil Carbon Dynamics in Relation to Landscape Dynamics. *AGU Fall Meeting, December 11-15, 2006 (INVITED)* .

**Berhe, A. A.**, Harden, J.W., Torn, M.S., Harte, J. In situ and ex situ decomposition of organic matter in eroding slopes vs. depositional settings. *ASA-CSSA-SSSA 70<sup>th</sup> Annual Meeting, Indianapolis, IN November 12-16, 2006*.

**Berhe, A. A.**, Harden, J. W., Torn, M.S., Burton, S.D., Kleber, M., Harte J. Geomorphic controls on the amount and quality of organic matter associated with mineral surfaces. *AGU Fall Meeting, December 5-9, 2005*

**Berhe, A. A.**, Harden, J. W. , Harte J., Torn, M.S. Physico-Chemical Controls on Soil Organic Carbon Stabilization in Eroding and Depositional Settings. *NSF Sponsored Workshop "Frontiers in Exploration of the Critical Zone". Newark, Delaware, October 24-26, 2005*.

- Berhe, A. A.,** Torn, M.S. , Harte J., Harden, J. W. Mechanisms of Soil Organic Matter Stabilization in Erosional and Depositional Systems. *Second International Conference on Mechanisms of Organic Matter Stabilization and Destablization in Soils*. October 9-13, 2005. Monterey, California.
- Berhe, A. A.,** Harden, J. W. , Harte J., Torn, M.S. Soil Degradation and Global Change: The role of soil erosion and deposition in carbon sequestration. *Breslauer Graduate Student Symposium on Social and Scientific Aspects of Global Climate Change*. February 25, 2005, University of California at Berkeley.
- Berhe, A. A.,** Harden, J. W. , Harte J., Torn, M.S. The Role of Erosion and Deposition in Soil Carbon Sequestration in an Undisturbed Watershed. *Geophysical Research Abstracts*, Vol. 7, 03871, 2005. *European Geosciences Union*. Vienna, Austria.
- Berhe, A. A.,** Harden, J. W., Torn, M.S. , Harte J. Erosion and Carbon Sequestration in two types of Depositional Basins. *ASA-CSSA-SSSA Abstracts*, Madison WI. (68<sup>th</sup> Annual Meeting Seattle, Washington). 2004.
- Berhe, A. A.,** Harden, J. W., Torn, M.S. , Harte J. Stabilization of eroded soil organic carbon in two types of depositional basins. *EOS Trans. AGU*, 85(47), Fall Meeting Supplements, B51C-0971.
- Berhe, A. A.,** Fischer, M., Torn, M.S. Soil Carbon and Nitrogen under different landuses in the Southern Great Plains. *ASA-CSSA-SSSA Abstracts*, Madison WI. (67<sup>th</sup> Annual Meeting Denver, Colorado). 2003.
- Berhe, A. A.** The Impact of Erosion on the Terrestrial Carbon Reservoir: Ecological and Socioeconomic Implications of Soil Erosion in Eritrea. *International Conference Commemorating the 10<sup>th</sup> Anniversary of the Independence of Eritrea: Lessons and Prospects*. July 22-26, 2001, Asmara, Eritrea..
- Berhe, A. A.** Of Land and Identity: Territorialization of the Eritrean Identity in the Land of Pride, as Delineated with Colonial Maps of Episodic Pain. *The 6<sup>th</sup> Graduate Conference in African Studies. Re-envisioning Africa: Multidisciplinary Perspectives in African Studies*, March 30 - April 2, 2001. Northwestern University, Evanston, Illinois, 2001.
- Berhe, A. A.,** T. Fries, T.A., Fuller, C.C., Harden, J.W., Miller, L.G., Haughy, R., Young, R. Isotope Based Inference of Organic Carbon Storage and Turnover Rates in Buried Sediments. *EOS Trans. AGU*, 83(47), Fall Meeting Supplements, B52A-0751.
- Berhe, A. A.** The Socio-economic and Environmental Reprcussions of the Eritrean Landmine Crisis, Landmine Monitor Conference, The Hague, Netherlands. 2000.

## PROFESSIONAL SERVICES AND SKILLS

Peer reviewer:

Enviornmental Science and Technology  
 Earth Surface Processes and Landforms  
 Journal of Environmental Quality  
 Journal of Agriculture and Human Values  
 Quaternary Research  
 Soil Science Society of America Journal

- Convener and Session Organizer, Soils: Mechanisms of Carbon Stabilization and Response to Climate Change. *American Geophysical Union Fall Meeting*, September 10-14, 2007. San Francisco, CA 2007
- Session chair, Carbon Cycling and Soil Processes. *Ecological Society of America Annual Meeting*, August, 2007. San Jose, CA 2007
- Judge for student presentation award, Society for Ecological Restoration Neering Award 2007
- Panelist and Session chair, From Student to Scientist; Finding a Postdoc & Life as a Postdoctoral Scientist . 2<sup>nd</sup> and 3<sup>rd</sup> *Annual Retreat of Berkeley Edge* (a recruitment, retention and advancement program for traditionally underrepresented minority graduate students in science, mathematics and engineering, UC Berkeley) 2007, 2008
- Mentor, Minorities Striving and Pursuing Higher Degrees of Success (MSPHD's) in Earth System Science Initiative 2007 - Present
- Coordinator, Berkeley NanoGeoChemistry meeting series, UC Berkeley 2006 - Present
- Project leader for Soil Erosion and Carbon Cycling study. University of California, Berkeley (Hired, trained and supervised five undergraduate work study students, laboratry and field research asistants) 2002-2006

Model Scientist for Lawrence Hall of Science's Roots of Knowledge Project " <i>Walk in the Woods</i> " [ K-12 teaching guide]	2003-2006
Mentor (two students) and Freshman Welcome Program volunteer, UC Berkeley	2005
Student representative, Ecosystem Sciences Division, UC Berkeley	2003-2004
Graduate Assembly delegate for student in the Department of Environmental Science, Policy and Management, UC, Berkeley	2001-2002
Co-founder and President of Eritrean Students Union, Michigan State University	1999-2000
Application and some Programming in MathCAD®, Arc View, MADONA, JMP IN®, SPSS® and Macromedia.	
Languages: Proficient in English, Tigrigna (Eritrean), Amharic (Ethiopian) and some speaking and writing in French. Worked as freelance translator for English to and from Tigrigna and Amharic from 1999 - 2005.	

## PROFESSIONAL AFFILIATIONS

American Geophysical Union  
 Soil Science Society of America  
 Mineralogical Society of America  
 Association of Women Soil Scientists  
 Eritrean Studies Association

## REFERENCES

Available upon request.