

ABBHEY WICK

North Dakota State University
Soil Science Department
239 Walster Hall, Dept 7680
Fargo, ND 58108
Office: 701-231-8973
Email: abbey.wick@ndsu.edu

CURRENT POSITION

August 2012-current *North Dakota State University* *Fargo, ND, USA*
Assistant Professor of Soil Health-Extension

I incorporate both fundamental and applied approaches to my research and extension activities, addressing the theory behind ecosystem processes as well as management practices to repair ecosystem processes following disturbance. I am specifically trained in soil organic matter dynamics/nutrient cycling, soil structural development and microbial ecology. Each property is a sensitive indicator of soil health, especially in lands that have been disturbed or impacted by salinity and/or sodicity.

PREVIOUS POSITION

March 2008-July 2012 *Virginia Tech* *Blacksburg, VA, USA*
Post-Doctoral Research Associate/Senior Research Associate
Marginal Soils Research Group (W. Lee Daniels)

I predominately assessed biological processes in undisturbed and disturbed soils using soil organic matter fractionation techniques, trace gas measurements and microbial assays. Research areas include: (1) modeling biogenic trace gas emissions and soil organic matter dynamics, (2) soil development with vegetation succession following mining, (3) crop establishment on marginal soils, (4) remediation of contaminated, acid forming and/or saline dredge sediment in an upland setting, and (5) rehabilitation of severely compacted urban soils to optimize tree establishment and growth (with Susan Day). Promoted to Senior Research Associate in 2011.

EDUCATION

August 2004-July 2007 *University of Wyoming* *Laramie, WY, USA*
Ph.D. Soil Science
Soil Ecology Lab (Pete Stahl)

Emphasis of research was the evaluation of soil organic matter pools in relation to re-established plant communities commonly found on reclaimed mine lands in the Powder River Basin of Wyoming. Analysis of naturally occurring stable carbon isotopes was used to investigate organic matter transfer among soil pools and soil aggregate hierarchy. This research was part of a larger project where microbial community structure, arthropod and nematode communities were evaluated.

September 2001-June 2004 *University of Denver*
M.A. Physical Geography
Geomorphology and Reclamation (Terry Toy)

Denver, CO, USA

Research was conducted on reclaimed mine lands in North Dakota to address questions pertaining to plant species establishment and recruitment on varying soil replacement depths and slope positions over sodic spoil material.

September 1997-June 2001 *University of Denver*
B.A. Geography

Denver, CO, USA

Keck Scholarship was awarded for the summer of 2000 to write a Geologic Training Manual for Florissant Fossil Beds National Monument, Florissant, CO and for the development of a virtual field trip for Timpanogos Cave National Monument, American Fork Canyon, UT. Partners in Scholarship (PINS) awarded for the fall of 2000 to work on urban change in the Observatory Park neighborhood of Denver, CO.

PUBLICATIONS

Published or accepted:

Huzurbazar, S., **A.F. Wick**, C. Gasch, and P.D. Stahl. Accepted (2/14/13). Incorporating Bayesian Predictive Distributions to Better Understand Soil Aggregation in Undisturbed Semiarid Grasslands. *Soil Science Society of America Journal*.

Wick, A.F., W.L. Daniels, Z. Orndorff and M.M. Alley. Accepted (1/10/13). Organic Matter Accumulation post-Mineral Sands Mining. *Soil Use and Management*.

Wick, A.F., R.L. Phillips, M.A. Liebig, M. West and W.L. Daniels. 2012. Linkages between Soil Micro-site Properties and CO₂ and N₂O Emissions during a Simulated Thaw for a Northern Prairie Mollisol. *Soil Biology and Biochemistry* 50:118-125.

Dangi, S.R., P.D. Stahl, **A.F. Wick**, L.J. Ingram and J.S. Buyer. 2012. Soil Microbial Community Recovery in Reclaimed Soil on a Surface Coal Mine Site. *Soil Science Society of America Journal* 76: 915-924.

Phillips, R.L., **A.F. Wick**, M.A. Liebig, M. West and W.L. Daniels. 2012. Biogenic Emissions of CO₂ and N₂O at Multiple Depths Increase Exponentially during a Simulated Soil Thaw for a Northern Prairie Mollisol. *Soil Biology and Biochemistry* 45:14-22.

Wick, A.F., S.D. Merrill, T.J. Toy and M. A. Liebig. 2011. Effect of Soil Depth and Land Structure on Plant Productivity and Community Development on 28-Year Old Reclaimed Mine Lands. *Journal of Soil and Water Conservation* 66: 201-211.

Wick, A.F., P.D. Stahl, L.J. Ingram and L. Vicklund. 2009. Soil Aggregation and Organic Carbon in Short-term Stockpiles. *Soil Use and Management* 25: 311-319.

Wick, A.F., P.D. Stahl, and L.J. Ingram. 2009. Aggregate Associated Carbon and Nitrogen in Reclaimed Sandy Loam Soils. *Soil Science Society of America Journal* 73: 1852-1860.

Wick, A.F., S. Huzurbazar, and P.D. Stahl. 2009. Use of Bayesian Methods to Model Soil Aggregation in Undisturbed Semiarid Grasslands. *Soil Science Society of America Journal* 73: 1707-1714.

Ganjugunte, G.K., **A.F. Wick**, P.D. Stahl and G.F. Vance. 2009. Soil Organic Carbon Sequestration in Reclaimed Coal Mine Lands. *Land Degradation and Development* 20:156-175.

Wick, A.F., P.D. Stahl, L.J. Ingram. 2009. Aggregate and Organic Matter Dynamics in Reclaimed Soils as Indicated by Stable Carbon Isotopes. *Soil Biology and Biochemistry* 41:201-209.

Ingram, L.J., P.D. Stahl, **A.F. Wick**, and J.A. Anderson. 2009. Organic Carbon Accumulation in Reclaimed Mine Soils of the Western U.S.A. pp. 311-319. In: R. Lal and R. Follett (Eds.) *Soil Carbon Sequestration and the Greenhouse Effect*, 2nd Edition, SSSA Special Publication 57, Madison, WI.

In review:

Gasch, C., A.F. Wick, S. Huzurbazar, S. Rana-Dangi, and P.D. Stahl. In review (12/5/12). Impacts of Crested Wheatgrass versus Native Species Establishment on Soil Properties in Two Reclamation Chronosequences. *Applied Soil Ecology*.

Wick, A.F., W.L. Daniels, W.L. Nash and J.A. Burger. In review (3/7/13). Aggregate Recovery in Reclaimed Coal Mine Soils in SW Virginia. *Geoderma*.

Chen, Y., S.D. Day, **A.F. Wick**, B.D. Strahm, P.E. Wiseman, W.L. Daniels. In review. The Effects of Urban Land Development Practices and Post-development Soil Rehabilitation on Soil Carbon Pools and Microbial Biomass Carbon. *Soil Biology and Biochemistry*.

In preparation:

Wick, A.F. and W.L. Daniels. In preparation. Mine Soil Development 19 Years after Biosolids Application. *Journal of Environmental Quality*.

Wick, A.F., J. Li, W.L. Daniels, G.E. Evanylo, W.L. Nash and J.A. Burger. In preparation. Organic Matter Quantity and Quality in Reclaimed Mine Soils of Southwest Virginia. *Organic Geochemistry*.

Wick, A.F., B.D. Strahm, and W.L. Daniels. In preparation. Comparison of Methods for Assessing Soil Carbon and Nitrogen Pools. *Soil Science Society of America Journal*.

MAGAZINE ARTICLES AND REPORTS

Wick, A.F. 2013. Does my Soil Have to be White to be Saline? Farm Forum, pp. xx.

Wick, A.F. 2013. Early Career Message: Bringing Ideas Together. Reclamation Matters, Official Publication of the American Society of Mining and Reclamation. Pp. xx. DEL Communications, Inc.

Wick, A.F. 2012. Salts, Sodium, Alkali – What’s the Difference? Corn Talk Magazine, North Dakota Corn Growers Association, pp. 12-13.

Wick, A.F., J. Harmon, D. Prischmann-Voldseth. 2012. Whole System Effects of Salinity in Corn and Soybean: An Overview of a Multi-Year, Multi-System Approach. Corn Talk Magazine, North Dakota Corn Growers Association, pp. 15.

Day, S.D. 2012. Soil Profile Rebuilding Specification. Guidelines for soil restoration techniques to be used at urban sites. Adopted for practice by landscape architects, planners, designers and municipalities. Contributors: S. Day, R. Layman, Y. Chen, K. Rolf, R. Harris, W. Daniels, P. Wiseman, K. McGuire, B. Strahm, **A. Wick** and B. Mauzy. www.urbanforestry.frec.vt.edu/SRES/specification.html

Wick, A.F., W.L. Daniels, and G. Whittecar. 2012. Annual Monitoring Report for 2011 Calendar Year Weanack Dredge Spoil Utilization. Annual permit compliance report to Virginia DEQ, Richmond, VA, February 22, 2012. 48 p.

Wick, A.F. 2012. Early Career Message: Re-visiting our Goals. Reclamation Matters. Official Publication of the American Society of Mining and Reclamation. Pp. xx. DEL Communications, Inc.

Wick, A.F., N.W. Haus, B.F. Sukkariyah, K.C. Haering, and W.L. Daniels. 2011. Remediation of PAH-Contaminated Soils and Sediments: A Literature Review. Available online: <http://landrehab.org/publications>

Wick, A.F. 2011. Early Career Message. Reclamation Matters. Official Publication of the American Society of Mining and Reclamation. Pp. 7. DEL Communications, Inc.

Daniels, W.L., G. Whittecar, and **A.F. Wick**. 2011. Annual Monitoring Report for 2010 Calendar Year Weanack Dredge Spoil Utilization. Annual permit compliance report to Virginia DEQ, Richmond, VA, February 22, 2011. 73 p.

Orndorff, Z.W., W. Lee Daniels, K. Meredith and **A.F. Wick**. 2011. Returning Heavy Mineral Sands Mines to Productive Agricultural Use. Reclamation Matters. Official Publication of the American Society of Mining and Reclamation. Pp. 24-29. DEL Communications, Inc.

Wick, A.F. 2010. Young Professionals Message. Reclamation Matters. Official Publication of the American Society of Mining and Reclamation. Pp. 6. DEL Communications, Inc.

Wick, A.F. 2009. Young Professionals Invitation and Message: The Next Generation of ASMR. Reclamation Matters. Official Publication of the American Society of Mining and Reclamation. Pp. 6-7. DEL Communications Inc.

Z. Orndorff, **A.F. Wick**, W.L. Daniels, C Teutch, M. Alley and C. Clarke. 2009. Reclamation Following Mineral Sands Mining: Annual Research Report. Submitted to Iluka Mineral Resources, Stony Creek, VA.

P.D. Stahl, L.J. Ingram, and **A.F. Wick**. 2008. Influence of Plant Community Structure and Topsoil Handling Method on Soil Structure Development and Microbial Community Recovery in Reclaimed Soil: Annual Research Report. Office of Surface Mining, Technology Transfer.

Wick, A.F., Z. Orndorff, W. Lee Daniels, C Teutch, M. Alley, P. Donovan, L. Zelazny, and C. Clarke. 2008. Reclamation Following Mineral Sands Mining: Annual Research Report. Submitted to Iluka Mineral Resources, Stony Creek, VA.

Wick, A.F. and D.B. Tinker. 2008. Prairie Restoration Environmental Assessment for Bent's Old Fort National Historic Site, La Junta, Colorado. National Park Service.

Stahl, P.D., L.J. Ingram, **A.F. Wick**, S. Rana, C.J. Bilbrough and S.V. Huzurbazar. 2007. Recovery of Belowground Ecosystem Components under Different Plant Communities on Coal Mine Reclamation Sites. AML Interim Progress Report 2006-2007.

CONFERENCE PROCEEDINGS (REVIEWED)

*presented all first author citations

Wick, A.F., W.L.Daniels, and C.H. Carter III. 2011. Soil Development and Vegetation Establishment on Amended Dredge Sediments. American Society of Mining and Reclamation meeting, June 11-16, Bismarck, ND. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Wick, A.F., W.L.Daniels, Z.W. Orndorff, and C.H. Carter III. 2011. Upland Placement and Management of Acid-Forming Dredge Materials. American Society of Mining and Reclamation meeting, June 11-16, Bismarck, ND. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Orndorff, Z.W., W.L. Daniels, K.R. Meredith, M.M. Alley, and **A.F. Wick**. 2011. Effects of Prime Farmland Soil Reconstruction Methods on Post-Mining Productivity of Mineral Sands Mine Soils in Virginia. American Society of Mining and Reclamation meeting, June 11-16, Bismarck, ND. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Wick, A.F., W.L. Daniels, W.L. Nash and J.A. Burger. 2010. Soil Aggregate, Organic Matter and Microbial Dynamics under Different Amendments after 30 Years of Mine Soil Development. American Society of Mining and Reclamation meeting, June 5-11, Pittsburgh, PA. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

W.L. Daniels, **A.F. Wick**, N.W. Haus, G.R. Whittecar, and C. Carter III. 2009. Criteria for Beneficial Utilization of Dredge Sediments in Virginia, USA. 3rd AMIREG International Conference: Assessing the Footprint of Resource Utilization and Hazardous Waste Management, Athens, Greece, September 7-9.

Wick, A.F. and W.L. Daniels. 2009. Physical Protection of Organic Matter in Reclaimed Coal Mine Soils of SW Virginia. Billings Land Reclamation Symposium, May 30-June 5, 2009, Billings, MT. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Clayton, H.G., **A.F. Wick** and W.L. Daniels. 2009. Microbial Biomass of Reclaimed Soils following Coal Mining in Virginia. Billings Land Reclamation Symposium, May 30-June 5, 2009, Billings, MT. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

P.D. Stahl, **A.F. Wick**, S. Dangi, V. Regula, L.J. Ingram, and D.L. Mummey. 2009. Ecosystem Recovery on Reclaimed Surface Minelands. Billings Land Reclamation Symposium, May 30-June 5, 2009, Billings, MT. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

P.D. Stahl, **A.F. Wick**, G. Gangegunte, U. Norton and L.J. Ingram. 2009. Redevelopment of soil carbon pools on reclaimed surface mine lands. Billings Land Reclamation Symposium, May 30-June 5, 2009, Billings, MT. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Wick, A.F., P.D. Stahl, L.J. Ingram and L. Vicklund. 2008. Soil Aggregate and Aggregate Associated Carbon Recovery in Short-term Stockpiles. American Society of Mining and Reclamation Meeting, June 14-19, Richmond, VA. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Wick, A.F., P.D. Stahl, S. Rana and L.J. Ingram. 2007. Recovery of Reclaimed Soil Structure and Function in Relation to Plant Community Composition. American Society of Mining and Reclamation Meeting, June 2-7, 2007, Gillette, WY. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Rana, S., P.D. Stahl, L.J. Ingram and **A.F. Wick**. 2007. Soil Microbial Community Composition in Reclaimed Soil under Different Vegetation in Wyoming Mine Lands. American Society of Mining and Reclamation Meeting, June 2-7, 2007, Gillette, WY. Published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Wick A.F., P.D. Stahl, L.J. Ingram, G.E. Schuman, and G.F. Vance. 2006. Aggregate Size Distribution and Stability under a Cool Season Grass Chronosequence on Reclaimed Coal Mine Lands in Wyoming. Billings Land Reclamation Symposium, June 5-8, 2006, Billings, MT. Jointly published by Billings Land Reclamation Symposium and American Society of Mining and Reclamation, 3134 Montevesta Rd., Lexington, KY 40502.

Stahl, P.D., L.J. Ingram, **A.F. Wick** and S. Rana. 2006. Relating Mineland Reclamation to Ecosystem Restoration. Billings Land Reclamation Symposium, June 5-8, 2006, Billings, MT. Jointly published by Billings Land Reclamation Symposium and American Society of Mining and Reclamation, 3134 Montavesta Rd., Lexington, KY 40502.

Rana, S., P.D. Stahl, and **A.F. Wick**. 2006. Influence of Plant Community Structure on Recovery of Belowground Microbial Communities in Reclaimed Surface Mined Soil. Billings Land Reclamation Symposium, June 5-8, 2006, Billings, MT. Jointly published by Billings Land Reclamation Symposium and American Society of Mining and Reclamation, 3134 Montavesta Rd., Lexington, KY 40502.

Wick, A.F., S.D. Merrill, T.J. Toy, J. Hendrickson, and M.A. Liebig. 2005. The Effects of Soil Depth and Soil Characteristics on Plant Community Development in North Dakota. P. 1233-1243. American Society of Mining and Reclamation Annual Meeting, Invited Session, June 19-23, 2005, Breckenridge, CO. Published by the Billings Land Reclamation Symposium and American Society of Mining and Reclamation, 3134 Montavesta Rd., Lexington, KY 40502.

EXTENSION PRESENTATIONS

Wick, A.F. 2012. Managing for Soil Health Parameters: Organic Matter and Aggregation. October 30, Soil Health Tour, Forman, ND (50 attendees)

Wick, A.F., C. Augustin, N. Kalwar. 2012. Soil Health – Where are we Headed and What’s your Role, November 8, NDSU Fall Extension Conference, Holiday Inn, Fargo, ND (40 attendees)

Wick, A.F., C. Augustin, N. Kalwar. 2012. Soil Health: Identifying and Managing Saline Soils, Two mini-sessions, November 19, ND Association of Soil Conservation Districts, Ramkota, Bismarck, ND (175 attendees).

Wick, A.F. 2012. Soil Health Challenges and Options, November 27, Northern Ag Expo, FargoDome, Fargo, ND (125 attendees).

Wick, A.F. 2012. NDSU Soil Health Initiative and Irrigation. December 6, Irrigation Workshop, Ramkota, Bismarck, ND (40 attendees)

Wick, A.F. 2012. NDSU Soil Health Initiative Update. December 7, ND Irrigation Association Board Meeting, Ramkota, Bismarck, ND (20 attendees)

Wick, A.F. 2012. Soil Salinity in Southwest North Dakota. December 13, 29th Annual Western Dakota Crops Day, Hettinger Armory, Hettinger, ND (50 attendees)

Wick, A.F. 2013. Salinity and Sodicity Issues and Management. January 4, Richland County Ag Day, Wahpeton, ND (50 attendees)

Wick, A.F. 2013. Soil Health Challenges and Options, January 7, American Crystal Corporate Office, Moorhead, MN (55 attendees)

Wick, A.F., C. Augustin, S. Samson-Liebig, H. Weiser, M. Liebig. 2013. January 9, Building a Sustainable Operation through Soil Health, Mandak Zero Tillage Meeting, Ramkota, Bismarck, ND (farmer rap session; 43 attendees)

Wick, A.F. 2013. Precision Agriculture and Salinity Mapping. January 22, Precision Agriculture Summit, Jamestown, ND (200 attendees)

Wick, A.F. 2013. Soil Health: Issues and Approaches. January 31, The Best of the Best in Wheat and Barley Research, Doublewood Inn, Bismarck, ND (75 attendees)

Wick, A.F. and B. Nelson. 2013. Salty Soils and Soybean Cyst Nematode: What do we Advise for Managing these Challenges, February 8, Advanced Crop Advisors Workshop, Fargo, ND (2 talks, 200 attendees)

Wick, A.F. 2013. Recovery of Soil Health Parameters in Reclaimed Lands. February 26, Reclamation-Bringing Ideas Together meeting at Dickinson State University, Dickinson, ND (225 attendees)

Wick, A.F. 2013. Soil Biology Linked to Soil Health. February 28, Grand Forks County Soil Health Workshop, Grand Forks, ND (150 attendees)

Wick, A.F. 2013. Soil Health Update. February 28, SBARE visit to NDSU, Fargo, ND (15 people)

Wick, A.F., A-M. Fortuna. 2013. Soil Health Update. March 6, NDSU REC annual meeting, Fargo, ND (30 people).

Wick, A.F. 2013. Building Aggregation and Soil Organic Matter in Agroecosystems. March 18, McLean Co. Ag Day (___ attendees)

Wick, A.F. 2013. Eastern and Western US Reclamation. March 25, Dickinson State University Reclamation Class, Dickinson, ND (5 attendees)

Wick, A.F. 2013. Soil Health in southeast ND, March 28, Forman workshop/Ag Day (___ attendees)

RESEARCH PRESENTATIONS AND POSTERS

*presented all first author presentations and posters

Wick, A.F., B.D. Strahm, R.L. Phillips, S. Waldron, K. Minick, and W.L. Daniels. 2012. Organic Matter Pools in Reclaimed Soils: Quantification Using Biological, Chemical and Physical Fractionation Methods. Presentation, Soil Science Society of America Meeting, October 21-24, Cincinnati, OH.

Chen, Y., S.D. Day, **A.F. Wick**, W.L. Daniels, B.D. Strahm, P.E. Wiseman. 2012. Relation of Microbial Biomass Carbon and Aggregate Size Distribution to Soil Carbon Pools Four Years after Urban Soil Rehabilitation. Presentation, Soil Science Society of America Meeting, October 21-24, Cincinnati, OH.

Carter III, C.H., W.L. Daniels, **A.F. Wick**, and C. Saunders. 2012. Development and Application of Screening Criteria for Beneficial Utilization of Dredge Sediments in Virginia, USA. Poster, PIANC USA/COPRI ASCE Dredging 2012, October 22-25, San Diego, CA.

Chen, Y., S.D. Day, B.D. Strahm, R.J. Shrestha, **A.F. Wick** and W.L. Daniels. 2012. Greenhouse Gas Emissions in Rehabilitated Urban Landscape Soils. Poster, Ecological Society of America Annual Meeting, August 5-10, Portland, OR.

Wick, A.F., W.L. Daniels, Z.W. Orndorff, and M.M. Alley. 2012. Carbon Accumulation and Stabilization Following Mineral Sands Mining in Eastern Virginia. Presentation. American Society of Mining and Reclamation meeting, June 8-15, Tupelo, MS. Abstract published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Daniels, W.L., **A.F. Wick**, C.H. Carter III, and C. Saunders. 2012. Screening Criteria for Beneficial Utilization of Dredge Sediments in Virginia, USA. Presentation. American Society of Mining and Reclamation meeting, June 8-15, Tupelo, MS. Abstract published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Chen, Y., S.D. Day, P.E. Wiseman, **A.F. Wick**, B.D. Strahm, W.L. Daniels and K.J. McGuire. 2012. Relation of Microbial Biomass Carbon and Tree Root Distribution to Soil Carbon Dynamics Four Years after Urban Soil Rehabilitation. Poster, Ecological Society of America – Mid-Atlantic Chapter Annual Meeting, April 14-15, Blacksburg, VA.

Li, J., G. Evanylo, **A.F. Wick**. 2011. Effects of Long Term Application of Organic Residues on Quantitative and Qualitative Soil Carbon Sequestration. Presentation, Soil Science Society of America Meeting, October 16-19, San Antonio, TX.

Chen, Y., S.D. Day, **A.F. Wick**, W.L. Daniels, B.D. Strahm, P.E. Wiseman, and K.J. McGuire. 2011. Characterization of Soil Carbon Pools Three Years after Urban Soil Rehabilitation. Poster, Soil Science Society of America Meeting, October 16-19, San Antonio, TX.

Howren, M.A., **A.F. Wick**, P. Donovan, W.L. Daniels, and C.H. Carter III. 2011. Plant-Soil Relations on Marine Dredge Material. Poster, American Society of Mining and Reclamation meeting, June 11-16, Bismarck, ND. Abstract published by ASMR, 3134 Montevesta Rd., Lexington, KY 40502.

Daniels, W.L., **A.F. Wick**, Z.W. Orndorff, C.H. Carter III. 2011. Prediction and Control of Sulfide Oxidation in Upland Placed Dredge Sediments. Presentation, Battelle International Conference on Remediation of Contaminated Sediments, February 7-10, New Orleans, LA.

Wick, A.F., W.L. Daniels, and P.D. Stahl. 2010. Carbon Accumulation and Storage in Reclaimed Mined Land Soils. Presentation, Soil Science Society of America Meeting, October 31-November 4, Long Beach, CA.

Wick, A.F., R.L. Phillips, M.A. Liebig, and W.L. Daniels. 2010. Soil Physiochemical Controls on Trace Gas Emissions from a North Dakota Mollisol. Presentation, Soil Science Society of America Meeting, October 31-November 4, Long Beach, CA.

Daniels, W.L., Z.W. Orndorff, M.M. Alley, **A.F. Wick**, and J.M. Galbraith. 2010. Mine Soil Properties, Reconstruction Protocols and Row-Crop Productivity of Reclaimed Mineral Sands Mines in Virginia. Presentation, Soil Science Society of America Meeting, October 31-November 4, Long Beach, CA.

Chen, Y., S.D. Day, **A.F. Wick**, P.E. Wiseman, and W.L. Daniels. 2010. Characterization of Soil Carbon Pools Two Years after Urban Soil Rehabilitation. Poster, International Society of Arboriculture, July 23-28, Chicago, IL.

Merrill, S.D., **A.F. Wick**, and M.A. Liebig. 2009. Effects of Land Form and Soil Characteristics on Plant Community Developments and Productivity on 28-Year Old Reclaimed Mine Land. Poster, Soil Science Society of America Meeting, November 1-5, Pittsburgh, PA.

Wick, A.F., K. Meredith, W.L. Daniels, M. Alley, and Z. Orndorff. 2008. Row Crop Response to Soil Reconstruction Methods Following Mineral Sands Mining in Virginia. Poster, Soil Science Society of America Meeting, October 5-9, 2008, Houston, TX.

Wick, A.F., P.D. Stahl, and L.J. Ingram. 2008. Aggregate Carbon and Nitrogen under Reestablished Grasses and Shrubs. Presentation, Soil Science Society of America Meeting, October 5-9, 2008, Houston, TX.

Wick, A.F., P.D. Stahl, L.J. Ingram, G.S. Schuman, and G.F. Vance. 2006. Soil Structural Recovery in Relation to Carbon and Nitrogen Content in a Chronosequence of Reclaimed Sites. Presentation, Soil Science Society of America Meeting, November 12-16, 2006, Indianapolis, IN.

Schmidt, S., **A.F. Wick**, and P.D. Stahl. 2006. Effects of Surface Coal Mining on Soil Structure and General Properties. Student Research Apprenticeship Program Symposium and Poster Session, July 28, 2006, Laramie, WY.

Wick, A.F., P.D. Stahl, L.J. Ingram, G.E. Schuman, and G.F. Vance. 2006. Soil Structural Recovery in Relation to Carbon, Nitrogen and Light Fraction Content in a Reclaimed Cool Season Grass Chronosequence in Wyoming. Presentation, University of Wyoming Graduate School Student Symposium, April 3-4, 2006, Laramie, WY.

Regula, V., **A.F. Wick**, and P.D. Stahl. 2006. Recolonization of Reclaimed Soils in Wyoming by Arthropods. Poster, University of Wyoming Graduate School Student Symposium, April 3-4, 2006, Laramie, WY.

Rana, S., **A.F. Wick**, P.D. Stahl, and L.J. Ingram. 2006. Influence of Plant Community Structure on Recovery of Belowground Microbial Communities in Reclaimed Surface Mine Soils. University of Wyoming Graduate School Student Symposium, April 3-4, 2006, Laramie, WY.

Wick, A.F., P.D. Stahl, L.J. Ingram, G.E. Schuman, and G.F. Vance. 2006. Aggregate Size Distribution under a Cool Season Grass Community Chronosequence on Reclaimed Coal Mine Lands in Wyoming. Presentation, Front Range Student Ecology Symposium, March 8, 2006, Ft. Collins, CO.

Wick, A.F., P.D. Stahl, G. F. Vance, G.E. Schuman, L.J. Ingram, L.C. Munn, and E.G. Pendall. 2005. Aggregate Size Distribution and Stability under Cool Season Grass Communities of Different Ages on Reclaimed Coal Mine Lands in Wyoming. Presentation, Soil Science Society of America Meeting, November 6-10, 2005, Salt Lake City, UT.

Garcia, A., **A.F. Wick**, and P.D. Stahl. 2005. Soil pH and Electrical Conductivity: Indicators of Soil Quality at Reclamation Sites. Student Research Apprenticeship Program Symposium and Poster Session, July 19, 2005, Laramie, WY.

Rana, S., **A.F. Wick**, P.D. Stahl, and G.F. Vance. 2005. Recovery of belowground ecosystem components under different plant communities on reclaimed coal mine lands. Poster, University of Wyoming Graduate School Student Symposium, Poster session, April 4-5, 2005, Laramie, WY.

With Paul Shepard, Laboratory of Tree Ring Research. 2001. Pilot Projects in the Sierra de Las Alazanas: (1) Microsite Variations and Tree Rings, (2) Effects of Dwarf Mistletoe Infection on Tree Ring Growth. Presentation, Proceedings of the 11th Annual North American Dendroecological Field week, August 2001, Saltillo, Coahuila, Mexico.

Luchsinger, D.A., and **A.W. Abley (Wick)**. 2001. Development of Geological Training and Reference Manuals for Florissant Fossil Beds National Monument. Presentation, George Wright Society Biennial Conference, April 16-20, 2001, Denver, CO.

Luchsinger, D.A., M.V. Ransmeier, and **A.W. Abley (Wick)**. 2001. Development of a Virtual Field Trip for Timpanogos Cave National Monument. Poster, George Wright Society Biennial Conference, April 16-20, 2001, Denver, CO.

RESEARCH AND EXTENSION GRANTS

Accepted (Total: \$711,016):

Mentor Relationship Travel Grant. NDSU Advance FORWARD, 2013, \$1,373 (**Wick**).

Establishment of the NDSU soil Health and Agricultural Research and Extension (SHARE) Farm. ND Corn Council, 2013-2014, \$68,950 (**Wick** and Casey).

Influence of Soil Salinity Gradients on Corn Production and Arthropod Pest Infestations. ND Corn Council, 2013-2014, \$53,219 (**Wick**, Harmon, Prischmann-Voldseth).

From the Ground Up: How do Soil Salinity Gradients Damage Soybeans, Contribute to Arthropod Pest Infestations and Impact Soil Nitrogen Reserves. North Dakota Soybean Council, 2013-2014, \$58,213 (**Wick**, Harmon, Prischmann-Voldseth).

Soil Health Video Development, ND Corn Council, Producer Education Mini-Grant, 2013, \$4,250 (**Wick**).

Equipment Grant, WinRhizo Pro, NDSU Extension Service and School of Natural Resource Sciences, 2012, \$5,000 (**Wick**).

Eastern North Dakota Soil Salinity Specialist – Years Three Four and Five. EPA-319, 2012-2014, \$191,921 (Franzen and **Wick**).

Soil Health/Soil Biology Training for the Northern Plains. NCR-SARE, 2012-2013, \$49,000 (Franzen; funds managed by **Wick**)

Equipment Grant, Shimadzu GC-2014 Greenhouse Gas analyzer with an AOC-5000 autosampler. Virginia Tech, College of Agriculture and Life Sciences, Equipment Trust Fund, 2010, \$66,760.00 (**Wick** and Daniels).

Vegetation Establishment on Amended Saline Dredge Materials. Weanack Land LLP, 2009-2011, \$90,000.00. (**Wick**, Daniels and Haus).

Influence of Plant Community Structure and Topsoil Handling Methods on Soil Structure Development and Microbial Community Recovery in Reclaimed Soil, Office of Surface Mining, 2007-2008, \$114,874.00 (Stahl, Ingram and **Wick**).

Effects of Stockpiling and Topsoil Replacement on Soil Carbon Pools, Foundation Coal Company, 2007, \$2,500.00 (**Wick** and Stahl).

Use of Stable Carbon Isotopes to Study Organic Matter Incorporation into Soil Aggregates in a Reclaimed Mine Soil, NSF-EPSCoR, 2006-2007, \$4,956.00 (**Wick** and Stahl).

In Review:

Empowering North Dakota Producers to Manage for Soil Health via Improved Extension Programs and Trainings at the County Level. North Central Sustainable Agriculture Research and Education, 2013-2015, \$197,372 (**Wick**)

Submitted, but not Funded:

Soil Health and Land Management Web and Media Development. ND Agricultural Products Utilization Commission, 2013-2014, \$16,975 (**Wick**)

EXTENSION WORKSHOPS AND TOURS

Soil Health Tour, NDSU Extension Service in cooperation with the Wild Rice Soil Conservation District and USDA-NRCS, October 30, 2012, Forman, ND. Funded by NCR-SARE (Franzen and Wick coordinators; 50 attendees).

Soil Health In Service Workshop, NDSU Langdon Research Extension Center, December 6, 2012, Langdon, ND. Funded by NCR-SARE (Kalwar and Wick coordinators; 100 attendees).

Soil Health in North Central ND, NDSU North Central Research Extension Center, January 29, 2013, Minot, ND. Funded by NCR-SARE (Augustin and Wick coordinators; 60 attendees).

Soil Health Concepts and Success Stories, NDSU Carrington Research Extension Center, February 12, 2013. Carrington, ND. Funded by NCR-SARE (Wick coordinator; 50 attendees).

Whole Systems Approach to Management, NDSU Carrington Research Extension Center, March 12, 2013, Carrington, ND. Funded by NCR-SARE (Wick coordinator).

Soil Health and Land Management in Southwest ND, NDSU Hettinger Research Extension Center, March 19-20, 2013, Hettinger, ND. Funded by NCR-SARE (Geaumont and Wick coordinators).

TEACHING AND MENTORING EXPERIENCE

*2008-Current
Guest Lecturer*

Virginia Tech

Blacksburg, VA, USA

Introductory Soil Science – Lecture series on Soil Ecology to a mixed group of non-science and science majors (75 students)

Plant Materials for Environmental Restoration – Lecture on vegetation succession and soil development and assessment following coal mining to a diverse group of students from landscape architecture, plant science and environmental sciences departments (30 students)

Field Day for Course on Environmental Restoration – Co-taught vegetation assessment techniques for production, cover and composition/diversity in the Powell River region of Virginia (2009; 30 students)

Mentor

I have mentored three undergraduate students (one per year) on a variety of research projects, including biological assessment and organic matter dynamics on reclaimed coal mine soils and plant-soil relations for remediated saline dredge materials. Each student was responsible for experimental and sampling design, implementation of the research, lab and statistical analyses and presentation of results in a scientific paper and/or national conference.

*2004-2007
Guest Lecturer*

University of Wyoming

Laramie, WY

Soils and Environmental Quality – Lectured on mine land reclamation and facilitated discussions on environmental issues on several occasions (30 students)

Mine Land Reclamation and Restoration Ecology Course – Lectured on specific research topics relevant to reclamation in the western United States (20 students)

Soil Genesis and Morphology – Lectured on the recovery of soils in severely disturbed ecosystems. Also, led occasional field trips which were 4 hours in length to demonstrate soil classification techniques in the Laramie Basin of Wyoming (60 students in lecture, 30 students on each field trip)

Lead Teaching Assistant

Introduction to Soils – Developed, coordinated and taught four lab sections on basic soil property analyses and concepts. Each lab started with a 30 minute lecture covering the appropriate background material for the lab (30 students per lab section)

Mentor (Student Research Apprenticeship Program)

Funded by Wyoming NSF EPSCoR, this is a program where high school students are exposed to research in a college setting. Each summer, I mentored one student where we designed a research project, collected samples, conducted lab work and data analysis, wrote a scientific paper and presented the research at a symposium.

2001-2003

University of Denver

Denver, CO

Lecturer

Physical Geography of Canyonlands - Field course co-taught while canoeing down the Green River north of Moab, UT (15-20 students, taught 2 consecutive years)

Natural History of the Black Hills - Field course co-taught in the Black Hills, SD (15 students; taught 2 consecutive years)

Lead Teaching Assistant

Our Dynamic Earth - Core course for non-science majors covering atmospheric sciences/meteorology, hydrology, and geology (120 students in lecture and 30 students per lab section)

Natural Resource Management - Upper division course (25 students)

2000-2001

National Park Service

Florissant, CO

Park Ranger/Educator

I typically gave three interpretive talks per day to visitors followed by a one hour hike around the park. We covered geologic history, current ecosystem dynamics, management and cultural history of the park (20-30 people ranging in age from children to adults)

ADDITIONAL PROFESSIONAL EXPERIENCE

December 2011 *CSU-NREL* *Ft. Collins, CO 80523*
Century/DayCent Training Workshop
William Parton (970-491-1965; billp@nrel.colostate.edu)

Attended a five day workshop on the Century series models (Century4.6, DayCent, ForCent, and PhotoCent). Underlying ecological theory and objectives were covered along with hands on use of the models.

November 2011 *VAPSS/MAPSS* *Fredericksburg, VA 22401*
Acid Sulfate Soils: Recognition, Remediation and Impact Prevention
W. Lee Daniels (540-231-7175; wdaniels@vt.edu)

Attended a one-day field course on acid sulfate soils in northern Virginia and Maryland.

June 2011 *USDA-ARS-NGPRL* *Mandan, ND, 58554*
Visiting Scientist/Collaborator
1701 10th Avenue SW
Rebecca Phillips (701-667-3002; rebecca.phillips@ars.usda.gov)

On-going research includes evaluation of root and soil aggregate influences on trace gas emissions with depth (1 m) under different management types (agricultural field and undisturbed). Research involves modeling of CO₂, N₂O and CH₄ production for in-field gas wells at various depths along with evaluation of soil properties. Additional collaborators include scientists at Woods Hole Research Center, Falmouth, MA.

May 2011 *Shimadzu Training* *Columbia, MD 21046*
Martin Smith (1-800-477-1227 x1932; mdsmith@shimadzu.com)

I attended a five day training course covering information on the Shimadzu GC 2014 greenhouse gas analyzer, Combi-pal autosampler and GC Solutions software. Both theory and mechanical operation concepts were covered as well as sample preparation.

October 2009, September 2010 *USDA-ARS-NGPRL* *Mandan, ND, 58554*
Visiting Scientist/Collaborator
1701 10th Avenue SW
Rebecca Phillips (701-667-3002; rebecca.phillips@ars.usda.gov)
Mark Liebig (701-667-3079; mark.liebig@ars.usda.gov)

I developed and implemented an incubation experiment measuring biogenic trace gas emissions under simulated spring-thaw and winter-freeze conditions from various depths of intact Mollisol cores. I also was exposed to two eddy covariance systems to track ecosystem fluxes of CO₂ and water vapor.

July 2007-February 2008 University of Wyoming Laramie, WY, 82071
Postdoctoral Research Associate
1000 University Ave.
Pete Stahl (307- 766-2179; unclem@uwyo.edu)
Dan Tinker (307-766-4967; tinker@uwyo.edu)

Research addressed biophysical recovery of reclaimed soils under varying soil replacement reclamation techniques (direct haul and stockpiled topsoil). During this time, I also developed a management plan and wrote an Environmental Assessment for prairie restoration adjacent to Bent's Old Fort National Historic Site, CO.

June 2002-July 2004 BKS Environmental Assoc, Inc. Gillette, WY, 82717
Consultant (summer hire)
PO Box 3467
Brenda Schladweiler (307-686-0800; bschladweiler@bksenvironmental.com)

Work involved soil descriptions and vegetation sampling on currently mined and undisturbed lands in the Powder River Basin, coal bed natural gas development areas, abandoned mined lands and bond release sites in Wyoming and Montana.

August 2001 NADFW Saltillo, Coahuila, Mexico
Attendee
Group leader: Paul Sheppard (520-621-8229; sheppard@ltr.arizona.edu)

I attended the 11th annual North American Dendroecological Field Week (NADFW) at the Universidad Autónoma Agraria. This field week was attended by approximately 50 international scientists. <http://dendrolab.indstate.edu/nadef/>

June 2000-September 2001 National Park Service Denver, CO, 80210
Park Ranger and GIS Specialist
Internship

I worked as a summer intern at the Florissant Fossil Beds National Monument, Florissant, CO (2000). I also worked on access databases and digitized geologic maps using ArcView 3.2 and ArcInfo (2001).

AWARDS AND SCHOLARSHIPS

American Society of Mining and Reclamation Memorial Scholarship for PhD Students, \$1,300.00, June 2007.

Second place, student presentations at the American Society of Mining and Reclamation Meeting, \$200.00, June 2007.

Third place, student presentations at the Billings Land Reclamation Symposium, \$100.00, June 2006.

Best oral presentation in session for University of Wyoming Graduate Symposium, April 2006.

American Society of Mining and Reclamation Memorial Scholarship for MS Students, \$1,000.00, June 2005.

Third place, student presentations at the American Society of Mining and Reclamation Meeting, \$100.00, June 2005.

Best poster in session, University of Wyoming Graduate Symposium, April 2005.

Plummer Scholarships from the School of Environment and Natural Resources at the University of Wyoming, \$3,400.00, August 2004-May 2007.

Minority/Women Graduate Assistantship at the University of Wyoming, \$33,366.00, September 2004-May 2007.

Dr. Robert D. Rudd Memorial Award for Outstanding Graduate Student of 2004 in the Geography Department at the University of Denver, \$100.00, June 2004.

Teaching assistantship at the University of Denver, \$60,204.00, September 2001-June 2003.

Outstanding Women in Geoscience Awards for students from Colorado, New Mexico, South Dakota and Wyoming Colleges and Universities from the Association for Women Geoscientists, April 2001.

Selected to join the Field Quarter travel course (1 of 15 students) at the University of Denver, field locations included Mt. Evans and Grand Mesa, CO, Black Hills, SD, Yellowstone National Park, WY and Baja, Mexico, 2000.

Partners in Scholarship award, \$1,500.00, September 2000.

Keck Scholarship, \$3,000.00, June-August 2000.

PROFESSIONAL MEMBERSHIPS, TRAINING AND COMMITTEES

American Society of Agronomy (2012-present)

Soil Ecology Society (October 2006-present)

American Society of Mining and Reclamation (ASMR, December 2003-present)

Soil Science Society of America (August 2003-present)

Mine Safety and Health Administration (MSHA) trained (2002-2007)

Women Geoscientists of America (June 2001-2007)

ASMR National Executive Committee (NEC) 2008-2011 - elected to this position

ASMR Web Development Committee 2009-2010 – co-chair

ASMR Early Career Members Committee 2009 to present – chair

ASMR National Meeting Planning Committee 2005, 2007, 2008

Coordinator for the ASMR Early Career social event in Pittsburgh, PA (2010, raised \$4000, 75 people) and the 2011 social event (raised \$2600, 55 people) and field tour (to ARS-NGPRL, 15 people) in Bismarck, ND.

EXTRACURRICULAR ACTIVITIES

Activities include running, swimming competitively with the Masters Swim Team, cycling, fly fishing, backpacking, stone sculpture/carving, adventure racing and triathlons.

FOREIGN TRAVEL

Aruba, Australia, Canada, Chile, Denmark, Fiji, Greece, Italy, Mexico, Norway, Sweden, Turkey and Venezuela

REVIEWER FOR THE FOLLOWING JOURNALS

Agriculture, Ecosystems and Environment (1)
European Journal of Soil Science (1)
Journal of Environmental Management (1)
Journal of Environmental Quality (2)
Land Degradation and Development (1)
Soil Use and Management (3)