

Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.

Signature _____ Date _____

I. Personal Information

I.A. UID, Last Name, First Name, Middle Name, Contact Information

Brian Andrew Needelman
Department of Environmental Science and Technology
College of Agriculture and Natural Resources
University of Maryland
1213 HJ Patterson Hall
College Park, MD 20742
bneed@umd.edu
<http://enst.umd.edu/people/faculty/brian-needelman>
UID 100876970

I.B. Academic Appointments at UMD

Associate Professor 2008–present; Appointment: 60% Research, 40% Teaching
Assistant Professor 2002–2008; Appointment: 60% Research, 40% Teaching

I.C. Administrative Appointments at UMD

I.D. Other Employment

| | | |
|-----------|---|---------------------|
| 1998–2001 | The Pennsylvania State University <i>Graduate Research Assistant</i> | University Park, PA |
| 1998–2001 | USDA-Agricultural Research Service <i>Research Support Scientist</i> | University Park, PA |
| 1995–1997 | University of Illinois <i>Graduate Research Assistant</i> | Urbana, IL |
| 1994 | Drumlin Farm's Food Project <i>Farm Manager and Youth Instructor</i> | Lincoln, MA |
| 1992–1993 | Kenya Institute of Organic Farming <i>Agricultural Extension Agent</i> | Gakurwe, Kenya |
| 1992 | Apongares Community Farm | El Sauce, Nicaragua |

I.E. Educational Background

| | | |
|------|---|---------------------|
| 2002 | The Pennsylvania State University <i>Ph.D. Soil Science</i> Adviser: Gary W. Petersen | University Park, PA |
| 1997 | University of Illinois | Urbana, IL |

M.S. Agronomy – Soil Science
Adviser: Michelle M. Wander

1993

School for International Training
B.I.S. International Studies

Brattleboro, VT

I.F. Professional Certifications and Licenses

II. Research, Scholarly and Creative Activities

In my field authors are listed in decreasing order of contribution, except for some cases in which senior author(s) are listed last. The following diacritics are used to identify authorship roles for book chapters, journal articles and professional publications:

- [^] (*caret*) designates senior or co-senior author(s)
- * (*asterisk*) identifies the corresponding author(s)
- # (*hash tag*) identifies co-authors I mentored as undergraduate and graduate students, postdoctoral researchers, or faculty research assistants

II.A. Books (include full citation information and ISBN)

II.A.1. Books Authored (*specify original or revised edition*)

II.A.2. Books Edited

II.A.3. Books Translated (*as translator*)

II.A.4. Textbooks

II.A.5. Major Reference Works

II.A.6. Exhibition Catalogs

II.A.7. Other

1. **Needelman, B.A.**, S. Crooks, C.A. Shumway, J.G. Titus, R. Takacs, and J.E. Hawkes. 2012. Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration. B.A. Needelman, J. Benoit, S. Bosak, and C. Lyons (eds.). Restore America's Estuaries, Washington D.C., pp. 1-63. (Non-refereed) Available at <https://www.estuaries.org/restore-adapt-mitigate-responding-to-climate-change-through-coastal-habitat-restoration>
2. Emmer, I.M., **B.A. Needelman**, S. Emmett-Mattox, S. Cooks, J.P. Megonigal, D. Myers, M. Oreska, K. McGlathery, and D. Schoch. 2015. Methodology for Tidal Wetland and Seagrass Restoration. VCS Methodology, 20 November 2015, v. 1.0. Verified Carbon Standard, Washington, DC. 116 pp. (Refereed). Available at <http://www.v-c-s.org/methodologies/methodology-tidal-wetland-and-seagrassrestoration-v10>.
3. Emmer, I.M., M. von Unger, **B.A. Needelman**, S. Cooks, and S. Emmett-Mattox. 2015. Coastal Blue Carbon in Practice: A Manual for Using the VCS Methodology for Tidal Wetland and Seagrass Restoration. Restore America's Estuaries, Arlington, VA., v. 1, 82 p. (Non-refereed). Available at https://www.estuaries.org/images/rae_coastal_blue_carbon_methodology_web.pdf
4. Emmer I.M., **Needelman B.A.**, Emmett-Mattox S., Crooks S., Megonigal J.P., Myers D., Oreska M.P.J., McGlathery K.J. (2020 a). Estimation of Baseline Carbon Stock Changes and Greenhouse Gas Emissions in Tidal Wetland Restoration and Conservation Project Activities (BL-TW). VCS Module VMD0050, v 1.0. Verra (Verified Carbon Standard): Washington, D.C. (Refereed)
 - a. World's first international blue carbon crediting protocol for tidal wetland conservation and restoration
5. Emmer I.M., **Needelman B.A.**, Emmett-Mattox S., Crooks S., Megonigal J.P., Myers D., Oreska M.P.J., McGlathery K.J. (2020b). Methods for Monitoring of Carbon Stock Changes and Greenhouse Gas Emissions and Removals in Tidal Wetland Restoration and Conservation Project

Activities (M-TW). VCS Module VMD0051, v 1.0, Verra (Verified Carbon Standard): Washington, D.C. (Refereed)

- a. World's first international blue carbon crediting protocol for tidal wetland conservation and restoration

II.B. Chapters

II.B.1. Books

1. Kleinman P.J.A. ^*, A.L. Allen, **B.A. Needelman**. 2010. The role of drainage ditches in nutrient transfers from heavily manured fields of the Delmarva Peninsula. In: M.T. Moore and R. Kroger (eds.) *Agricultural Drainage Ditches: Mitigation Wetlands for the 21st Century*. Research Signpost, Kerala, India. p. 107–123. ISBN 978-81-308-0376-0. (Refereed)
2. Rabenhorst, M.C. ^*, and **B.A. Needelman**. 2016. Soils of Tidal Wetlands. In: M.J. Vepraskas et al. (eds) *Wetland Soils: Genesis, Hydrology, Landscapes, and Classification*, 2nd ed., CRC Press, Boca Raton, FL, pp. 347-364. (Refereed).
3. Johnson, K., **B.A. Needelman**^, and M. Paolisso^. 2017. Vulnerability and Resilience to Climate Change in a Rural Coastal Community. In: Michele Companion and Miriam Chaiken (eds.) *Responses to Disasters and Climate Change: Understanding Vulnerability and Fostering Resilience*. CRC Press, Boca Raton, FL, pp. 5-14. (Refereed)
4. **Needelman, B. A.**^*, I. M. Emmer, M. P. J. Oreska, and J. P. Megonigal. 2018. Blue Carbon Accounting for Carbon Markets. In: L. Windham-Myers, S. Crooks, and T. Troxler (eds.). *A Blue Carbon Primer: The State of Coastal Wetland Carbon Science, Policy, and Practice*. CRC Press, Boca Raton, FL, pp. 283–294.

II.B.2. Collections

II.B.3. Encyclopedia

II.B.4. Series

II.B.5. Research Paper

II.B.6. Other

1. **Needelman, B.A.** 2012. Overview of Coastal Habitats, In B.A. Needelman, J. Benoit, S. Bosak, and C. Lyons (eds.), *Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration*, Restore America's Estuaries, Arlington, VA, pp.7–13 (Non-refereed)
2. **Needelman, B.A.** 2012. Climate change and coastal habitats, In B.A. Needelman, J. Benoit, S. Bosak, and C. Lyons (eds.), *Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration*, Restore America's Estuaries, Arlington, VA, p. 14–22. (Refereed)
3. **Needelman, B.A.**, and J.E. Hawkes. 2012. Mitigation of greenhouse gases through coastal habitat restoration. In B.A. Needelman, J. Benoit, S. Bosak, and C. Lyons (eds.), *Restore-Adapt-Mitigate: Responding to Climate Change Through Coastal Habitat Restoration*, Restore America's Estuaries, Arlington, VA, p. 49–57. (Refereed)

II.C. Articles in Refereed Journals

1. Smith, O.H., G.W. Petersen^*, and **B.A. Needelman**. 1999. Ecological indicators of agroecosystems. *Advances in Agronomy* 69:76–97.

2. **Needelman, B.A.**, M.M. Wander^{^*}, G.A. Bollero, C.W. Boast, G.K. Sims, and D.G. Bullock. 1999. Interaction of tillage and soil texture: Biologically active soil organic matter in Illinois. *Soil Science Society of America Journal* 63:1326–1334.
3. **Needelman, B.A.**, W.J. Gburek^{^*}, A.N. Sharpley, and G.W. Petersen. 2001. Environmental management of soil phosphorus: Modeling spatial variability in small fields. *Soil Science Society of America Journal* 65:1516–1522.
4. **Needelman, B.A.**, M.M. Wander^{^*}, and G.S. Shi. 2001. Organic carbon extraction efficiency in chloroform fumigated and non-fumigated soils. *Soil Science Society of America Journal* 65:1731–1733.
5. Gburek, W.J.^{^*}, C.C. Drungil, M.S. Srinivasan, **B.A. Needelman**, and D.E. Woodward. 2002. Variable-source-area controls on phosphorus transport: Bridging the gap between research and design. *Journal of Soil and Water Conservation* 57:534–543.
6. Kleinman, P.J.A.^{^*}, **B.A. Needelman**, A.N. Sharpley, and R.W. McDowell. 2003. Using soil phosphorus profile data to assess phosphorus leaching potential in manured soils. *Soil Science Society of America Journal* 67:215–224.
7. **Needelman, B.A.**, W.J. Gburek^{^*}, G.W. Petersen, A.N. Sharpley, and P.J.A. Kleinman. 2004. Surface runoff along two agricultural hillslopes with contrasting soils. *Soil Science Society of America Journal* 68:914–923.
8. Gburek, W.J.^{^*}, **B.A. Needelman**, and M.S. Srinivasan. 2005. Fragipan controls on runoff generation: Hydropedological implications at landscape and watershed scales. *Geoderma* 131:330–344.
9. **Needelman, B.A.**^{^*}, and D.E. Ruppert#. 2006. Graduate student-run course framework for comprehensive professional development. *Journal of Natural Resource and Life Sciences Education*. 35:62–71.
10. Hsieh, C., A.P. Davis^{^*}, and **B.A. Needelman**. 2007. Bioretention column studies of phosphorus removal from urban stormwater runoff. *Water Environment Research* 79:177–184.
11. Scott, M.L.#, **B.A. Needelman**^{^*}, and M.C. Rabenhorst. 2007. Morphology and characterization of soils formed in Marlboro Clay regolith. *Soil Science* 172:233–241.
12. Vaughan, R.E.#, **B.A. Needelman**^{^*}, P.J.A. Kleinman, and A.L. Allen. 2007. Spatial variation of soil phosphorus within a drainage ditch network. *Journal of Environmental Quality*. 36:1096–1104.
13. **Needelman, B.A.**^{^*}, P.J.A. Kleinman, J.S. Strock, and A.L. Allen. 2007. Improved management of agricultural drainage ditches for water quality protection: An overview. *Journal of Soil and Water Conservation* 62:171–178.
 - Review article.
14. **Needelman, B.A.**^{^*}, D.E. Ruppert#, and R.E. Vaughan#. 2007. The role of ditch soil formation and redox biogeochemistry in mitigating nutrient and pollutant losses from agriculture. *Journal of Soil and Water Conservation* 62:207–215.

15. Kleinman, P.J.A.^*, A.L. Allen, **B.A. Needelman**, A.N. Sharpley, P. Vadas, L. Saporito, G. Folmar, and R.B. Bryant. 2007. Dynamics of phosphorus transfers from heavily manured Coastal Plain soils to drainage ditches. *Journal of Soil and Water Conservation* 62:225–235.
16. Hsieh, C., A.P. Davis^*, and **B.A. Needelman**. 2007. Nitrogen removal from urban stormwater runoff through layered bioretention columns. *Water Environment Research* 79:2404–2411.
17. Penn, C.^*, R. Bryant, **B.A. Needelman**, and P.J.A. Kleinman. 2007. Spatial distribution of soil phosphorus across selected New York dairy farm pastures and hay fields. *Soil Science* 172(10):797–810.
18. Vaughan, R.E.#, **B.A. Needelman**^*, P.J.A. Kleinman, and A.L. Allen. 2007. Vertical distribution of phosphorus in agricultural drainage ditch soils. *Journal of Environmental Quality* 36:1895–1903.
19. Scott, M.L.#, and **B.A. Needelman**^*. 2007. Utilizing water well logs for soil parent mapping in the Mid-Atlantic Coastal Plain. *Soil Science* 172:701–720.
20. Mirsky, S.B.*, L.E. Lanyon^, and **B.A. Needelman**. 2008. Evaluating soil management using particulate and chemically labile soil organic matter fractions. *Soil Science Society of America Journal* 72:180–185.
21. Mirsky, S.B.*, L.E. Lanyon^, and **B.A. Needelman**. 2008. Mechanical grinding for particulate organic matter analysis. *Communications in Soil Science and Plant Analysis* 39:1147–1153.
22. Vaughan, R.E.#, **B.A. Needelman**^*, P.J.A. Kleinman, and M.C. Rabenhorst. 2008. Morphology and characterization of ditch soils at an Atlantic Coastal Plain farm. *Soil Science Society of America Journal* 72:660–669.
23. Wills, S.A.#, **B.A. Needelman**^*, and R.W. Weil. 2008. Carbon distribution in restored and reference marshes at Blackwater National Wildlife Refuge. *Archives of Agronomy and Soil Science* 54:239–248.
24. Vaughan, K., M.C. Rabenhorst^*, and **B.A. Needelman**. 2009. Saturation and temperature effects on the development of reducing conditions in soils. *Soil Science Society of America Journal* 73:663–667.
25. Devereux, O.H. #*, K.L. Prestegard^, **B.A. Needelman**^, A.C. Gellis. 2010. Suspended sediment sources in an urban watershed, Northeast Branch Anacostia River, Maryland. *Hydrological Processes* 24:1391–1403.
26. Poffenbarger, H.#, **B.A. Needelman**^*, and J.P. Megonigal^*. 2011. Salinity influence on methane emissions from tidal marshes. *Wetlands* 31:831–842.
 - Most cited paper in this journal in 2011.
27. Leslie, A.W.*, R.F. Smith, D.E. Ruppert#, K. Bejleri, J.M. McGrath^, **B.A. Needelman**^, W.O. Lamp^. 2012. Environmental factors structuring benthic macroinvertebrate communities of agricultural ditches in Maryland. *Journal of Environmental Entomology* 41:802–812.
 - W.O. Lamp primary senior author.
28. Bickford, W.A.#, **B.A. Needelman**^*, R.R. Weil, and A.H. Baldwin. 2012. Vegetation response to prescribed fire in Mid-Atlantic brackish marshes. *Estuaries and Coasts* 35:1432–1442.

29. Bickford, W.A. #*, A.H. Baldwin[^], **B.A. Needelman[^]**, and R.R. Weil. 2012. Canopy disturbance alters competitive outcomes between two brackish marsh plant species. *Aquatic Botany* 103:23–29.
30. **Needelman, B.A.** 2013. What Are Soils? *Nature Education Knowledge* 4(3):2.
<http://www.nature.com/scitable/knowledge/library/what-are-soils-67647639>
31. Laub, B.G., O.W. McDonough, **B.A. Needelman**, M.A. Palmer^{^*}. 2013. Comparison of channel stability restoration and riparian buffer restoration effects on riparian soils. *Restoration Ecology*.
32. Geatz, G.W.#, **B.A. Needelman^{^*}**, R.R. Weil, and J.P. Megonigal. 2013. Nutrient availability and soil organic matter decomposition response to prescribed burns in Mid-Atlantic brackish marshes. *Soil Science Society of America Journal* 77: 1852–1864.
33. Gold, A.J.^{^*}, K. Addy, M.B. David, L.A. Schipper, and **B.A. Needelman**. 2013. Artificial sinks: Opportunities and challenges for managing offsite nitrogen losses. *Journal of Contemporary Water Research and Education* 151:9–19.
34. Fenstermacher, D.E., M.C. Rabenhorst^{^*}, M.W Lang, G.W. McCarty, and **B.A. Needelman**. 2014. Distribution, Morphometry, and Land Use of Delmarva Bays. *Wetlands* 34: 1219–1228.
35. Bickford, W.A.#, **B.A. Needelman^{^*}**, M.M. Miller#, W.G. Hutchins#. 2015. Prescribed fire increases soil temperatures through canopy removal in a Mid-Atlantic brackish marsh. *Journal of Coastal Research* 31:941-945.
36. Goldman, M.#, and **B.A. Needelman^{^*}**. 2015. Wetland restoration and creation for nitrogen removal: Challenges to developing a watershed-scale approach in the Chesapeake Bay Coastal Plain. *Advances in Agronomy* 132:1-38.
37. Stolt, M.^{^*}, and **B.A. Needelman**. 2015. Fundamental Changes in Soil Taxonomy. *Soil Science Society of America* 79(4):1001–1007.
38. Fenstermacher, D.E., M.C. Rabenhorst^{^*}, M.W Lang, G.W. McCarty, and **B.A. Needelman**. 2016. Soil Carbon in Natural, Cultivated and Restored Depressional Wetlands in the Mid-Atlantic Coastal Plain. *Journal of Environmental Quality* 45:743–750.
39. Ruppert D.E.*#, **B.A. Needelman[^]**, P.J.A. Kleinman, M.C. Rabenhorst, B. Momen, D.B. Wester. 2017. Hydrology and Soil Manipulations of Iron-Rich Ditch Mesocosms Provide Little Evidence of Phosphorus Capture within the Profile. *Journal of Environmental Quality* 46:596–604.
40. Wainger, L.^{^*}, A. McMurray, M. Paolisso, K.J. Johnson, and **B.A. Needelman**. 2017. Coastal Community Values for Marsh-Dependent Socioecological Services Revealed through a Systematic Qualitative Approach. *Agricultural and Resource Economics Review* 46:338–364.
41. B.W. Davis#, **B.A. Needelman^{^*}**, M.A Cavigelli, S.A. Yarwood, J.E. Maul, G.A. Bagley, S.B. Mirsky^{^*}. 2017. A Novel Approach to Estimating Nitrous Oxide Emissions during Wetting Events from Single-Timepoint Flux Measurements. *Journal of Environmental Quality* 46:247–254.
42. Oreska, M.^{^*}, K. McGlathery, I. Emmer, **B.A. Needelman**, S. Emmett-Mattox, S. Crooks, J.P. Megonigal, D. Myers. 2018. Comment on ‘Geoengineering with seagrasses: is credit due where credit is given?’. *Environmental Research Letters* 13.

43. **Needelman, B.A.**^{^*}, I. Emmer, , S. Emmett-Mattox, S. Crooks, J.P. Megonigal, D. Myers, M.P.J. Oreska, and K. McGlathery. 2018. The science and policy of the Verified Carbon Standard Methodology for Tidal Wetland and Seagrass Restoration. *Estuaries and Coasts*. *Estuaries and Coasts*. 41:2159–2171.
 - Article selected to be featured in Coastal and Estuarine Science News (an electronic newsletter for coastal managers).
44. Davis, B.W.#, **B.A. Needelman**, M.A Cavigelli, S.A. Yarwood, and S.B. Mirsky^{^*}. 2019. Nitrous oxide emissions increase exponentially with organic N rate from cover crops and poultry litter. *Agriculture, Ecosystems & Environment* 272:165–174.
45. Paolisso, M. ^{^*}, C. Prell, K. Johnson, **B.A. Needelman**, I.M.P Khan, K. Hubacek. 2019. Enhancing socio-ecological resilience in coastal regions through collaborative science, knowledge exchange and social networks: A case study from the Deal Island Peninsula, USA. *Socio-Ecological Practice Research* 1:109–123.
46. Goldman, M.A.#, **B.A. Needelman**^{^*}, M.C. Rabenhorst, M.W. Lang, G.W. McCarty, P. King. 2020. Digital soil mapping in a low-relief landscape to support wetland restoration decisions. *Geoderma* 373:114420.
47. Stolt, M.H.^{^*}, A.T. O’Geen, D.E. Beaudette, P.J. Drohan, J.M. Galbraith, D.L. Linbo, H.C. Monger, **B.A. Needelman**, M.C. Rabenhorst, M.D. Ransom, J.N. Shaw. 2021. Changing the hierarchical placement of soil moisture regimes in Soil Taxonomy. *Soil Science Society of America Journal* 85: 488–500.
 - Authors alphabetical following Beaudette.
48. Wessel, B.* , M.C. Rabenhorst[^], **B.A. Needelman**. 2021. A subaqueous soil-landscape conceptual model to guide soil survey in Chesapeake Bay subestuaries. *Soil Science Society of America Journal* 85:1727-1740.
49. Derby, R.K.#, **B.A. Needelman**^{^*}, A.A. Roden, and J.P. Megonigal. 2022. Vegetation and hydrology stratification as proxies to estimate methane emission from tidal marshes. *Biogeochemistry* 157:227–243.

II.D. Published Conference Proceedings

II.D.1. Refereed Conference Proceedings

1. Rubinstein, M.I.#, **B.A. Needelman**, D.M. Balduff, and M.C. Rabenhorst. 2003. LIDAR for subaqueous and terrestrial soil landscape analysis. In *Proc. Terrain Data: Applications and Visualization, Terrain Data Conference 2003*, Oct. 25–30, ASPRS and MAPPS.

II.D.2. Non-Refereed Conference Proceedings

II.D.3. Historical Conference Proceedings (10+ years ago)

II.D.4. Other

II.E. Conferences, Workshops, and Talks

II.E.1. Keynotes

II.E.2. Invited Talks

International

1. **Needelman, B.A.** 2001. The hydrology of phosphorus transport on two agricultural hillslopes. In *Annual Meetings Abstracts [CD-ROM]*. ASA-CSSA-SSSA, Madison, WI.

2. Vaughan, R.E.#, and **B.A. Needelman**. 2004. Drainage ditches. Influence of man-made activities on the soil-water environment due to agricultural activities. A scientific video conference between Moscow State University Environmental Engineering and the University of Maryland, Oct. 15, College Park, MD.
3. **Needelman, B.A.** 2006. Soil versus a soil: Natural bodies in our age. 18th World Congress of Soil Science, July 9–15, Philadelphia, PA.
4. **Needelman, B.A.** 2008. Carbon offsetting through tidal marsh restoration and conservation. The Society of Wetland Scientists 29th Annual Meeting, May 26–30, Washington, DC.
5. **Needelman, B.A.**, W.A. Bickford#; G.W. Geatz#, A.H. Baldwin, and J.P. Megonigal. 2012. Prescribed fire increases coastal marsh plant productivity through canopy removal. University of Antwerp, June 25, Antwerp, Belgium.
6. **Needelman, B.A.** 2012. Blue carbon opportunities and challenges in the Chesapeake Bay. International Blue Carbon Scientific Working Group 4th Workshop, Oct. 9–11, Annapolis, MD.
7. Emmer, I., S. Emmett-Mattox, S. Crooks, and **B.A. Needelman**. 2014. Greenhouse Gas Accounting in Tidal Wetland Conservation. North American Blue Carbon Experts and Partners Workshop, April 23-25, Menlo Park, CA.
8. **Needelman, B.A.**, I. Emmer, S. Emmett-Mattox, S. Crooks, J.P. Megonigal, D. Myers, M. Oreska, and K. McGlathery. 2014. International Tidal Wetland and Seagrass Restoration Accounting Methodology for the Verified Carbon Standard. Joint Aquatic Sciences Meeting, May 18-23, Portland, OR.
9. Megonigal, J.P., **B.A. Needelman**, S. Crooks, S. Emmett-Mattox, and D. Myers. 2015. A research agenda to support carbon credit accounting in tidal wetlands. Society of Wetland Scientists Annual Meetings, May 31 – June 4, Providence, RI.
10. Needelman, B.A. 2019. Blue Carbon Accounting for Carbon Markets. Soil Science Society of America Annual Meeting, Nov 10–13. San Antonio, TX.

National

11. **Needelman, B.A.** 2008. Restoration strategies and climate change. Adaptive Management of Estuaries in the Face of Climate Change, session at the 4th National Conference on Coastal and Estuarine Habitat Restoration, Oct. 11–15, Providence, RI.
12. **Needelman, B.A.** 2008. Overview of climate change and coastal habitat restoration interactions: The emerging role of coastal habitat restoration for carbon sequestration. START: Evaluating the Relationship Between Climate Change Impacts and Coastal Habitat Restoration, session at the 4th National Conference on Coastal and Estuarine Habitat Restoration, Oct. 11–15, Providence, RI.
13. Strelbel, D.E., **B.A. Needelman**, J. Sherwell. 2010. Coastal wetlands restoration and carbon markets: A Maryland perspective. Restore America's Estuaries 5th National Conference on Coastal and Estuarine Habitat Restoration, Nov. 13–17, Galveston, TX.
14. **Needelman, B.A.**, 2012. Mitigating greenhouse gases through coastal habitat restoration. American Wetland Month Webinar, US EPA, May 15, Washington, DC.
15. Paolisso, M., K.J. Johnson, and **B.A. Needelman**. 2015. Building Marsh and Community Resilience

on the Deal Island Peninsula. Bridging the Gulfs, Interdisciplinary Methods for Stakeholder Engagement and Collaborative Research in the National Estuarine Research Reserve System, Wells National Estuarine Research Reserve, Sept. 22-23, Maine.

16. Johnson, K.J., M. Paolisso, and **B.A. Needelman**. 2015. Building Marsh and Community Resilience on the Deal Island Peninsula. Bridging the Gulfs, Interdisciplinary Methods for Stakeholder Engagement and Collaborative Research. Lessons from the National Estuarine Research Reserve System (NERRS), Mission Aransas National Estuarine Research Reserve, Jan. 14-15, Texas.

State/Regional/Local

17. **Needelman, B.A.** 2001. Phosphorus transport and the pedologist. Current Trends in Phosphorus and P Index Research. Pennsylvania Association of Professional Soil Scientists. May 5, The Pennsylvania State University, University Park, PA.
18. **Needelman, B.A.** 2006. A pedologist digs into the ditches – soils, phosphorus, and the black ooze. University of Maryland Center for Environmental Science, Horn Point Laboratory, Cambridge, MD.
19. **Needelman, B.A.**, S.A. Wills#, M.C. Rabenhorst, and R.R. Weil 2007. Carbon sequestration in restored tidal wetlands: Worth the credit? Versar, Inc., March 9, Columbia, MD.
20. **Needelman, B.A.** 2007. Value of sequestered carbon in restored tidal marshes at the Blackwater National Wildlife Refuge. Global Climate Change Meeting, Chesapeake Marshlands National Wildlife Refuge Complex, April 4, Cambridge, MD.
21. **Needelman, B.A.**, M.L. Scott#, and M.C. Rabenhorst. 2007. Mapping and Morphology of the Marlboro Clay Formation in Prince George's County. Delaware/Maryland Soil Survey Work Planning Conference, Dec. 4, Woodside, DE.
22. **Needelman, B.A.** 2007. Keeping our heads above water: Carbon sequestration for sustainability of Maryland tidal marshes. Maryland Department of Natural Resources MANTA seminar series, Dec. 13, Annapolis, MD.
23. **Needelman, B.A.** and R.C. Crew#. 2008. Tidal marshes and sustainability. Focus The Nation 2008, Jan. 31, University of Maryland, Baltimore.
24. **Needelman, B.A.** 2008. Tidal marsh restoration and conservation for climate change mitigation and adaptation. Joint Global Change Research Institute seminar series, March 12, College Park, MD.
25. **Needelman, B.A.** 2009. Prescribed burns and sustainability in Chesapeake Bay marshlands. Research Experience for Undergraduates (REU) Summer Seminar Series, University of Maryland Center for Environmental Science, Horn Point Laboratory, July 16, Cambridge, MD.
26. **Needelman, B.A.** 2009. Wetland science: Understanding wetland function, formation, preservation and restoration. Workshop on Chesapeake Clean Water Initiative: Wetland Science, Ecosystem Health, Water Resources and Management, University of Maryland, Feb. 26, College Park, MD.
27. **Needelman, B.A.**, and A.H. Baldwin. 2009. The value of wetlands and coastal marshes: Carbon sequestration and treatment wetlands. The Maryland-Asia Environmental Partnership's Environmental Leadership Series, University of Maryland, Oct. 1, College Park, MD.
28. **Needelman, B.A.** 2012. Mitigating climate change impacts through habitat restoration. Habitat

Restoration Workshop of the Long Island Sound Study, Dec. 4, E. Setauket, NY.

29. **Needelman, B.A.**, and M. Paolisso. 2014. Deal Island Peninsula Marsh and Community Project: The collaborative learning approach. Community of Practice on Climate Adaptation for Eastern Shore Tidal Marshes and Coastal Communities, April 24, Blackwater National Wildlife Refuge, Cambridge, MD.
30. **Needelman, B.A.**, M. Paolisso, and K.J. Johnson. 2014. Resilience and decision-making in a coastal socio-ecological system responding to sea-level rise. Center for the Advanced Study of Communities and Information (CASCI) speaker series, April 15, School of Information Studies, College Park, MD.
31. Paolisso, M., K.J. Johnson, and **B.A. Needelman**. 2014. Integrating social and Natural Sciences to Build Marsh and Community Resilience. External Advisory Board, Maryland Sea Grant, College Park, MD.
32. Derby, R.K.#, **B.A. Needelman**, and J.P. Megonigal. 2016. Methane Emissions from Four Plant Communities on the Deal Island Peninsula in Maryland. Maryland Department of Natural Resources, Sept, Annapolis, MD.
33. **Needelman, B.A.** 2021. The Basics of Blue Carbon. Webinar: Accounting for Maryland's Blue Carbon. Webinar Series: Collaborative Activities on Blue Carbon in Maryland. University of Maryland Center for Environmental Science, Maryland Departments of the Environment and Natural Resources, and Maryland Sea Grant on behalf of the Maryland Commission on Climate Change, Dec 8, 70 participants.

II.E.3. Refereed Presentations

34. **Needelman, B.A.**, P.J.A. Kleinman, A.L. Allen, and F.J. Coale. 2006. The Ditch Project: Soils, phosphorus, and the ooze. USDA-CSREES 2006 National Water Conference: Research, Extension, and Education for Water Quality and Quantity. Feb. 5–9, San Antonio, TX.
35. **Needelman, B.A.** 2010. The human side of implementation of climate change adaptation for coastal habitats. Restore America's Estuaries 5th National Conference on Coastal and Estuarine Habitat Restoration, Nov. 13–17, Galveston, TX.
36. Paolisso, M., K.J. Johnson, **B.A. Needelman**, and S. Land. 2014. Building marsh and community resilience on the Deal Island Peninsula. Restore America's Estuaries National Summit, Washington, DC.
37. Emmer, I., S. Emmett-Mattox, **B.A. Needelman**, and S. Crooks. 2014. New carbon market procedures: Recognizing the value of delta wetlands. Deltas in Times of Climate Change II, Sept. 24–26, Rotterdam, Netherlands.
38. **Needelman, B.A.**, and M.H. Stolt. 2015. Fundamental Changes in Soil Taxonomy Task Force. National Cooperative Soil Survey Conference, June 7–11, Duluth, MN.
39. Goldman, M.A.#, and **B.A. Needelman**. 2015. Digital soil disaggregation in a low-relief landscape to support wetland restoration decisions. National Cooperative Soil Survey Conference, June 7–11, Duluth, MN.
40. Goldman, M.A., **B.A. Needelman**, M. Lang, M.C. Rabenhorst, J. Brewer, P. King. 2015. Digital Soil Disaggregation in a Low-Relief Landscape to Support Wetland Restoration Decisions. National

Cooperative Soil Survey National Conference, June 7–11, Duluth, MN.

41. **Needelman, B.A.**, M.H. Stolt, D. Beaudette, P. Drohan, J. Galbraith, J. Hempel, D. Lindbo, C. Monger, A. O'Geen, M.C. Rabenhorst, M. Ransom, and J. Shaw. 2015. Fundamental Changes in Soil Taxonomy Task Force. National Cooperative Soil Survey National Conference, June 7–11, Duluth, MN.
42. Derby, R.K.#, **B.A. Needelman**, and J.P. Megonigal. 2016. Data for a Tidal Brackish Marsh Methane Emissions Model Validation. Society of Wetland Scientists Annual Meetings, June, Corpus Christi, TX.
43. Derby, R.K.#, **B.A. Needelman**, and J.P. Megonigal. 2016. High Pore Water Hydrogen Sulfide in a Tidal Brackish Marsh with Substantial Methane Emissions. 8th International Acid Sulfate Soils Conference, July, College Park, MD.
44. Derby, R.K.#, **B.A. Needelman**, and J.P. Megonigal. 2016. *Spartina alterniflora* has Higher Methane Emissions in a Tidal Brackish Marsh than Other Plant Communities at Similar Salinities. Restore America's Estuaries, Bi-Annual Meeting, Dec, New Orleans, LA.
45. **Needelman, B.A.** 2018. Tidal Wetland Soils for Greenhouse Gas Mitigation: Scientific Progress and Research Gaps. World Congress of Soil Science, Aug 12–17, Rio De Janeiro, Brazil.
46. Arias-Ortiz, Ariane, Jaxine Wolfe, Scott Bridgham, James R. Holmquist, Sara Knox, Gavin McNicol, Patrick Megonigal, **Brian Needelman**, Julie Shahan, Ellen J. Stuart-Haëntjens, Jianwu Tang, Lisamarie Windham-Myers, Patty Oikawa. 2021. A Synthesis of Tidal Wetland Methane Emissions Across the Contiguous United States. American Geophysical Union Annual Meeting, Dec 13–17 New Orleans, LA.
 - Authors alphabetical following Wolfe.

II.E.5. Refereed Posters

47. Scott, M.L.#, and **B.A. Needelman**. 2003. Technological advancements of Maryland soil survey information with GIS technology. Proc. Towson University GIS Conference, June 2–3, Baltimore, MD.
48. Scott, M.L.#, and **B.A. Needelman**. 2004. Taking a closer look at a problematic formation: Digitally mapping the Marlboro Clay Formation. Proc. Towson University GIS Conference, March 22–23, Baltimore, MD.
49. **Needelman, B.A.**, S.A. Wills#, M.C. Rabenhorst, and R.R. Weil. 2006. Carbon sequestration in soils of restored tidal marshes. International Tidal Wetlands Conference, May 31–June 2, Salisbury, MD.
50. **Needelman, B.A.** 2008. Coastal wetland restoration for carbon offsets: Science and policy. National Council for Science and the Environment's 8th National Conference: Climate Change: Science and Solutions, Jan. 16–18, Washington, DC.
51. Gindi, L.# and **B.A. Needelman**. 2013. Ditch-drained marshes: A geospatial assessment of extent, health and restoration potential in Maryland's tidal marshes. 26th annual TUGis conference, March 19, Towson, MD.
52. Fanning, D.S., M.C. Rabenhorst, **B.A. Needelman**, M. Levin, and W.L. Daniels. 2015. Eighth

International Acid Sulfate Soils Conference at University of Maryland. National Meeting of the American Society of Mining and Reclamation, Reclamation Opportunities for a Sustainable Future, June 6 – 11, Lexington, KY.

53. Derby, R.K.#, **B.A. Needelman**, J.P. Megonigal, and J.T. Morris. 2014. Developing a model for methane emissions in brackish marshes for use in carbon crediting. Restore America's Estuaries, Bi-Annual Meeting, Washington, DC.

II.E.6. Refereed Panels

54. **Needelman, B.A.**, M. Paolisso, S. Land, and C. Feurt. 2014. Bridging social sciences and ecology using collaborative science to increase habitat and community resilience. Restore America's Estuaries National Summit, Washington, DC.

II.E.7. Non-Refereed Presentations

55. Bollero, G.A., M.M. Wander, **B.A. Needelman**, and D.G. Bullock. 1997. The use of multivariate statistics in soil quality data. p. 56. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.
56. **Needelman, B.A.**, M.M. Wander, G.A. Bollero, C.W. Boast, and D.G. Bullock. 1997. Tillage, texture, and biologically-active soil organic matter in Illinois soils. p. 213. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.
57. Wander, M.M., G.A. Bollero, **B.A. Needelman**, and G. Walter. 1997. Tillage impacts on soil quality: Process and analysis. p. 213. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.
58. Kleinman, P.J.A., A.N. Sharpley, **B.A. Needelman**, T.C. Daniel, P.A. Moore. 2000. National phosphorus project protocol: Sampling and source water. Southern Extension-Research Activity – Information Exchange Group 17. July 29, 2000, Madison, WI.
59. Gburek, W.J., **B.A. Needelman**, and M.S. Srinivasan. 2001. Phosphorus transport in upland catchments—Connectivity of field to stream. Changing Wetlands—New Developments in Wetland Sciences, University of Sheffield, Sheffield, UK.
60. Srinivasan, M.S., W.J. Gburek, and **B.A. Needelman**. 2001. Identification of runoff generation mechanisms: Scaling from hillslope to watershed. Chapman Conference—State-of-the-art in hillslope hydrology. American Geophysical Union, Sunriver, OR.
61. **Needelman, B.A.**, W.J. Gburek, and M.S. Srinivasan. 2003. Fragipan controls on runoff generation: Hydropedological implications at landscape and watershed scales. Soil Science Society of America International Annual Meetings, Madison, WI.
62. Lal, R., L. Biehl, S. Duiker, P. Grace, W. McFee, **B.A. Needelman**, X. Niu, P. Robertson, M. Sperow, and Z. Tan. 2005. Opportunities and challenges of sequestering carbon in the terrestrial ecosystems of the midwestern region. Fourth Annual Conference on Carbon Capture and Sequestration. May 2–5, Alexandria, VA.
63. Kleinman, P.J.A., A.L. Allen, A.N. Sharpley, and **B.A. Needelman**. 2005. Monitoring phosphorus transport in a ditch-drained farming system. Soil Science Society of America International Annual Meetings, Madison, WI.
64. **Needelman, B.A.**, A.L. Allen, P.J.A. Kleinman, F.J. Coale, and J. McCoy. 2005. Drainage ditch

management to mitigate nutrient losses from agroecosystems. USDA-CSREES 2005 National Water Quality Conference: Research, Extension, and Education for Clean Water. February 7-9, La Jolla, CA.

65. **Needelman, B.A.**, R.E. Vaughan#, and M.C. Rabenhorst. 2005. The new soils: A pedological investigation of drainage ditches. Soil Science Society of America International Annual Meetings, Madison, WI.
66. Allen, A.L., P.J.A. Kleinman, A.N. Sharpley, and **B.A. Needelman**. 2006. Monitoring agricultural drainage ditches for water quality protection. USDA-CSREES 2006 National Water Conference: Research, Extension, and Education for Water Quality and Quantity. February 5–9, San Antonio, TX.
67. Allen, A.L., F. Hazem, P.J.A. Kleinman, and **B.A. Needelman**. 2006. Exposing high school scholars to geospatial information technologies and water quality management. USDA-CSREES 2006 National Water Conference: Research, Extension, and Education for Water Quality and Quantity. February 5–9, San Antonio, TX.
68. **Needelman, B.A.**, M.C. Rabenhorst, R.R. Weil. 2006. Carbon sequestration in restored tidal marshes at Blackwater National Wildlife Refuge. Chesapeake Marshlands National Wildlife Refuge Complex Third Annual Science Meeting, March 8, Cambridge, MD.
69. Allen, A.L., P.J.A. Kleinman, A.N. Sharpley, P. Vadas, and B.A. Needelman. 2006. Phosphorus losses in a ditch-drained farming system in the Delmarva Peninsula. 18th World Congress of Soil Science, July 9–15, Philadelphia, PA.
70. **Needelman, B.A.** 2006. Understanding the role of ditch soil formation and biogeochemistry in mitigating nutrient and pollutant losses from agriculture. Improved management of agricultural drainage ditches for water quality protection: science, policy and management, Aug. 23, College Park, MD.
71. Devereux, O.H.#, **B.A. Needelman**, K.L. Prestegard, A.C. Gellis, and J.C. Ritchie. 2006. Quantifying fine sediment sources in the Northeast Branch of the Anacostia River using trace elements and radionuclides. Geological Society of America Annual Meetings, Oct. 22–25, Philadelphia, PA. GSA Abstracts, Vol. 38, No. 7.
72. **Needelman, B.A.** 2007. Soil genesis for sustainability in ditches and marshes. Department of Environmental Science and Technology seminar series, Sept. 19, College Park, MD.
73. **Needelman, B.A.** 2008. Carbon sequestration for the sustainability and funding of marsh restoration and conservation projects. Atlantic Estuarine Research Society Spring Meeting: Effects of Climate Change on Mid-Atlantic Coastal Wetlands: Science and Conservation, March 13–15, Lewes, DE.
74. **Needelman, B.A.**, R.C. Crew#, M.C. Rabenhorst, R.R. Weil, J.P. Megonigal, J.S. Clough. 2008. Carbon sequestration and organic matter accumulation in Blackwater tidal marshes. Chesapeake Marshland National Wildlife Refuge Complex 5th Annual Science Meeting, April 9, Wye Mills, MD.
75. Crew, R.C.#, **B.A. Needelman**, R.R. Weil, M.C. Rabenhorst, and J.P. Megonigal. 2008. Accretion response of soils in a restored and natural tidal marsh under rapid relative sea level rise. Soil Science Society of America International Annual Meetings, Madison, WI.

76. **Needelman, B.A.**, H. Poffenberger#, and J.P. Megonigal. 2009. Methane emission and carbon sequestration balance in brackish marshes. Coastal and Estuarine Research Federation 20th Biennial Conference, November 1–5, Portland, OR.
77. Lamp, B., A. Leslie, B. Smith, K. Bejleri, Y. Fouli, J. McGrath, **B.A. Needelman**, and D.E. Ruppert. 2010. Ecological function and bioassessment of agricultural ditches on the Delmarva Peninsula. National Water Conference, Feb. 23, Hilton Head, SC.
78. Bickford, W.A.#, **B.A. Needelman**, R.R. Weil, A.H. Baldwin, and J.P. Megonigal. 2010. Above and below-ground vegetation response to prescribed fire in Mid-Atlantic brackish marshes. Chesapeake Marshland National Wildlife Refuge Complex 7th Annual Science Meeting, March 17, Wye Mills, MD.
79. Geatz, G.W.#, **B.A. Needelman**, R.R. Weil, and M.C. Rabenhorst. 2010. Organic matter decomposition response to prescribed fire in mid-Atlantic brackish marshes. Chesapeake Marshland National Wildlife Refuge Complex 7th Annual Science Meeting, March 17, Wye Mills, MD.
80. **Needelman, B.A.** 2010. Implementation, coasts, climate change and our uncertain demise. ENST Departmental Seminar, Sept. 29, College Park, MD.
81. Wolf, J.#, **B.A. Needelman**, L. Ziska, and G. Mora-Bourgeois. 2011. The effects of global change on soils, using urbanization as a surrogate in field studies. George Wright Society meeting, New Orleans, LA.
82. **Needelman, B.A.**, W.A. Bickford#; G.W. Geatz#, A.H. Baldwin, R.R. Weil, and J.P. Megonigal. 2011. Prescribed burns promote sedge plant production through the mechanism of canopy removal in marshes at the Blackwater National Wildlife Refuge. Society of Wetland Scientists South Atlantic and Mid-Atlantic Joint Chapter Meeting, March 7–8, Reston, VA.
83. **Needelman, B.A.** 2011. Carbon crediting for coastal wetland restoration: Science and policy update from Maryland. In Annual Meetings Abstracts. SSSA, Madison, WI.
84. Ruppert, D.E.#, **B.A. Needelman**, B. Momen, M.C. Rabenhorst, B. James, and P.J.A. Kleinman. 2011. Phosphorus release from ditch mesocosms: The effects of pedology and hydrology. In Annual Meetings Abstracts. SSSA, Madison, WI.
85. **Needelman, B.A.**, and L.A. Gindi#. 2012. Geospatial Data and Soil Survey Interpretations for Siting Artificial Nitrogen Sinks. 2012 Land Grant/Sea Grant National Water Conference, May 20–24, Portland, OR.
86. **Needelman, B.A.**, J.P. Megonigal. 2012. Carbon crediting for tidal marshes: Projects in Maryland. INTECOL 9 International Wetlands Conference, June 3–8, Orlando, FL.
87. **Needelman, B.A.**, W.A. Bickford#; G.W. Geatz#, A.H. Baldwin, J.P. Megonigal. 2012. Prescribed fire increases coastal marsh plant productivity through canopy removal. Society of Wetlands Science European Chapter Meeting, June 17–21, Aarhus, Denmark.
88. **Needelman, B.A.**, and L. Gentry. 2012. Biophysical limits to adoption of denitrification management systems. Soil Science Society of America Annual Meetings, Oct. 21–24, Cincinnati, OH.
89. Gold, A., K. Addy, M. David, L. Schipper, **B.A. Needelman**, J. Raval, and E. Monahan. 2013. Advancing the adoption and strategic placement of artificial nitrogen sinks. 68th International

Conference of the Soil and Watershed Conservation Society, July 21–24, Reno, NV.

90. **Needelman, B.A.** 2013. Soil science contributions to socio-ecological system resilience. Multi-state Project NE1038 Hydropedology: Genesis, Properties, and Distribution of Hydromorphic Soils Annual Meetings, June 3–6, Salisbury, MD.
91. **Needelman, B.A.** 2013. Carbon crediting for coastal wetlands. Multi-state Project NE1038 Hydropedology: Genesis, Properties, and Distribution of Hydromorphic Soils Annual Meetings, June 3-6, Salisbury, MD.
92. Wolf, J.W.#, L. Ziska, **B.A. Needelman**. 2013. Refining expectations of soil organic carbon storage under future climate change with observational studies. Carbon-Climate Connections in the Earth System, National Center for Atmospheric Research, July 29 – Aug 16, Boulder, CO.
93. **Needelman, B.A.**, Michael J. Paolisso, Patricia Delgado, Sasha Land, Lisa Wainger, Paul Leisnham, Andrew Baldwin, Robert Tjaden, Dorothea Lundberg#, Katherine J. Johnson, Diane Leason, Natallia Leuchanka. 2013. Building Marsh & Community Resilience on the Chesapeake Bay: Integrating socio-ecological research and collaborative learning to increase marsh and community resilience to sea-level rise. Biennial Conference of the Coastal and Estuarine Research Federation (CERF), Nov. 3–7, San Diego, CA.
94. Megonigal, P.J., **Needelman, B.A.**, S. Crooks, D. Myers, S. Emmett-Mattox, and I. Emmer. 2013. A research agenda to support carbon credit accounting in tidal wetlands. Coastal and Estuarine Research Federation (CERF), Nov. 3–7, San Diego, CA.
95. **Needelman, B.A.**, D. Lundberg#, K.J. Johnson, M. Paolisso, L. Wainger, A. Baldwin, P. Leisnham, D. Leason, and R. Tjaden. 2013. Ditch-Drained Marsh Soil Characterization to Support Socio-Ecological Restoration Decisions. Soil Science Society of America International Annual Meetings, Nov. 3–6, Tampa, FL.
96. Geatz, G.W.#, **B.A. Needelman**, R.R. Weil, M.C. Rabenhorst, and J.P. Megonigal. 2013. Nutrient Levels and Organic Matter Decomposition Following Prescribed Burns in Mid-Atlantic Coastal Marshes. Soil Science Society of America International Annual Meetings, Nov. 3–6, Tampa, FL.
97. Collins, L.M., G.K. Felton, R.B. Bryant, **B.A. Needelman**, and A.L. Allen. 2013. Surface Application of Flue Gas Desulfurization Gypsum and Infiltration Rates in a Coastal Plain Soil. Soil Science Society of America International Annual Meetings, Nov. 3–6, Tampa, FL.
98. Paolisso, M.P., K.J. Johnson, and **B.A. Needelman**. 2014. Culture, Collaborative Learning, and Socio-Ecological Resilience to Sea-Level Rise and Flooding. Annual Meeting of the Resilience Increasing Strategy for Coasts (RISC) Project. May 7-9, Cambridge University, England.
99. **Needelman, B.A.**, and S. Simpson. 2014. Applying the new tidal wetland and seagrass restoration methodology. ACES (A Community on Ecosystem Services) Conference, Dec. 8-12, Washington, D.C.
100. Megonigal, J.P., **B.A. Needelman**, S. Crooks, S. Emmett-Mattox, D. Myers, and I. Emmer. 2015. A research agenda to support carbon credit accounting in tidal wetlands. Society of Wetland Scientists Annual Meetings, May 31–June 4, Providence, RI.

101. **Needelman, B.A.** 2016. Carbon Sequestration, Methane Emissions and Prescribed Fire at the Blackwater National Wildlife Refuge. Management of Wetlands and Marshes: A Project for Iran. Blackwater National Wildlife Refuge, March 15, Cambridge, MD.

II.E.9. Non-Refereed Posters

102. **Needelman, B.A.**, M.M. Wander, G.A. Bollero, C.W. Boast, D.G. Bullock, and G.K. Sims. 1996. Tillage and texture: Interactions and impacts on biologically-active soil nitrogen pools. p. 238. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.

103. **Needelman, B.A.**, M.M. Wander, and G.S. Shi. 1998. Extraction efficiency in the chloroform fumigation-extraction method. p. 224. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.

104. **Needelman, B.A.**, W.J. Gburek, A.N. Sharpley, and G.W. Petersen. 1999. Site-specific environmental management for small fields: Modeling spatial P distribution with low sampling intensity. p. 285. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.

105. **Needelman, B.A.** P.J.A. Kleinman, A.N. Sharpley. 2000. Runoff plot-scale variability in soil phosphorus: Implications for soil sampling design. p. 332. In Agronomy abstracts. ASA-CSSA-SSSA, Madison, WI.

106. **Needelman, B.A.**, and P.J.A. Kleinman. 2002. Submeter to landscape scale spatial variability of soil phosphorus: Modeling and implications. Soil Science Society of America International Annual Meetings, Madison, WI.

107. Coppock, C.C., M.C. Rabenhorst, and **B.A. Needelman**. 2003. Subaqueous soils in Rehoboth Bay, DE: Soil mapping in a coastal lagoon. Soil Science Society of America International Annual Meetings, Madison, WI.

108. Scott, M.L.#, **B.A. Needelman**, and S. Davis. 2003. Old and new techniques to map a problematic soil. Soil Science Society of America International Annual Meetings, Madison, WI.

109. Vaughan, R.E.#, **B.A. Needelman**, A.L. Allen, and P.J.A. Kleinman. 2003. Nutrient transport in soils of Coastal Plain agricultural drainage ditches. Soil Science Society of America International Annual Meetings, Madison, WI.

110. Coppock, C.R., M.C. Rabenhorst, and **B.A. Needelman**. 2004. Subaqueous soil landscape models in a coastal lagoon. Soil Science Society of America International Annual Meetings, Madison, WI.

111. Iyappan, S.#, **B.A. Needelman**, R.R. Weil, and M.C. Rabenhorst. 2004. Carbon sequestration potential in wetlands of the Mid-Atlantic and Midwest. Soil Science Society of America International Annual Meetings, Madison, WI.

112. Ruppert, D.E.#, and **B.A. Needelman**. 2004. Graduate student-run course framework in scientific communication and professional development. Soil Science Society of America International Annual Meetings, Madison, WI.

113. Scott, M.L.#, **B.A. Needelman**, and S. Davis. 2004. Characterizing and mapping the Marlboro Clay formation for a soil survey update. Soil Science Society of America International Annual Meetings, Madison, WI.

114. Vaughan, R.E.#, **B.A. Needelman**, P.J.A. Kleinman, and A.L. Allen. 2004. Drainage ditch soil

morphological properties: Implications for nutrient transport. Soil Science Society of America International Annual Meetings, Madison, WI.

115. Devereux, O.H.#, **B.A. Needelman**, A.C. Gellis, K.L. Prestegard, and J.C. Ritchie. 2005. Determining sediment source in the Anacostia River through fingerprinting and GIS data analysis. Soil Science Society of America International Annual Meetings, Madison, WI.
116. Devereux, O.H.#, **B.A. Needelman**, K.L. Prestegard, A.C. Gellis, and J.C. Ritchie. 2005. Determining sediment sources in the Anacostia River watershed. American Geophysical Union Fall Meeting. December 5–9, San Francisco, CA.
117. Ruppert, D.E.#, **B.A. Needelman**, P.J.A. Kleinman, and A.L. Allen. 2005. Phosphorus and organic matter in drainage ditches of the Atlantic Coastal Plain. Soil Science Society of America International Annual Meetings, Madison, WI.
118. Scott, M.L.#, **B.A. Needelman**, and M.C. Rabenhorst. 2005. Water well logs for county-level parent material mapping. Soil Science Society of America International Annual Meetings, Madison, WI.
119. Devereux, O.H.#, **B.A. Needelman**, K.L. Prestegard, A. Gellis, J. Ritchie. 2006. Sediment source identification in an urban watershed. 18th World Congress of Soil Science, July 9–15, Philadelphia, PA.
120. Vaughan, R.E.#, D.E. Ruppert#, **B.A. Needelman**, P.J.A. Kleinman, M.C. Rabenhorst, A.L. Allen. 2006. Drainage ditch phosphorus: Vertical, lateral, and temporal dynamics. 18th World Congress of Soil Science, July 9–15, Philadelphia, PA.
121. Allen, A.L., **B.A. Needelman**, P.J.A. Kleinman, and T. Earl. 2006. Exposing High School scholars to geospatial information technologies and water quality management. Improved management of agricultural drainage ditches for water quality protection: science, policy and management, Aug. 23, College Park, MD.
122. Ruppert, D.E.#, **B.A. Needelman**, P.J.A. Kleinman, and A.L. Allen. 2006. Seasonal dynamics of phosphorus sorption and transport in two ditch soils. Soil Science Society of America International Annual Meetings, Madison, WI.
123. Wills, S.A.#, **B.A. Needelman**, M.C. Rabenhorst, and R.R. Weil. 2006. Initial carbon distribution in restored tidal marshes at Blackwater National Wildlife Refuge. Soil Science Society of America International Annual Meetings, Madison, WI.
124. Devereux, O.H.#, **B.A. Needelman**, K.L. Prestegard, J.C. Ritchie, and A.C. Gellis. 2006. Quantifying fine sediment sources in the Northeast Branch of the Anacostia River using trace elements and radionuclides. Soil Science Society of America International Annual Meetings, Madison, WI.
125. Wills, S.A.#, **B.A. Needelman**, P.J.A. Kleinman, and A.L. Allen. 2006. Phosphorus transport in a ditch-drained agroecosystem during two large stormflow events. Soil Science Society of America International Annual Meetings, Madison, WI.
126. Wills, S.A.#, **B.A. Needelman**, M.C. Rabenhorst, and R.R. Weil. 2007. Accretion and carbon sequestration in restored tidal marshes at Blackwater National Wildlife Refuge. Chesapeake Marshlands National Wildlife Refuge Complex 4th Annual Science Meeting, Mar 14, Cambridge, MD.

127. Kranowitz, J., J. Bradbury, D. Birch, and **B.A. Needelman**. 2007. Carbon sequestration at the Blackwater National Wildlife Refuge. Chesapeake Marshlands National Wildlife Refuge Complex 4th Annual Science Meeting, Mar 14, Cambridge, MD.
128. Ruppert, D.E.#, **B.A. Needelman**, M.C. Rabenhorst, and P.J.A. Kleinman. 2007. Ditch soil mesocosms: The effects of soil horizonation on P uptake. 10th International Symposium on Wetland Biogeochemistry, April 1–4, Annapolis, MD.
129. Wills, S.A.#, **B.A. Needelman**, M.C. Rabenhorst, and R.R. Weil. 2007. Soil carbon and nitrogen distributions in restored tidal marshes at Blackwater National Wildlife Refuge. 10th International Symposium on Wetland Biogeochemistry, April 1–4, Annapolis, MD.
130. **Needelman, B.A.** 2007. Carbon credits for coastal wetland restoration. Soil Science Society of America International Annual Meetings, Madison, WI.
131. Ruppert, D.E.#, **B.A. Needelman**, M.C. Rabenhorst, P.J.A. Kleinman, and A.L. Allen. 2007. Ditch soil mesocosms: The effects of soil horizonation and hydrology on P uptake. Soil Science Society of America International Annual Meetings, Madison, WI.
132. Wills, S.A.#, R.C. Crew#, **B.A. Needelman**, M.C. Rabenhorst, and R.R. Weil. 2007. Accretion and carbon sequestration in restored tidal marshes at Blackwater National Wildlife Refuge. Soil Science Society of America International Annual Meetings, Madison, WI.
133. Wolf, J.#, L.H. Ziska, **B.A. Needelman**, and K. George. 2007. Community composition and growth dynamics of arbuscular mycorrhizal fungi along an urban-to-rural gradient. Soil Science Society of America International Annual Meetings, Madison, WI.
134. Crew, R.C.#, **B.A. Needelman**, #G.W. Geatz, M.C. Rabenhorst, R.R. Weil, and J.P. Megonigal. 2008. Organic matter accumulation, carbon sequestration and methane emissions in the tidal marshes at Blackwater National Wildlife Refuge. Chesapeake Marshland National Wildlife Refuge Complex 5th Annual Science Meeting, April 9, Wye Mills, MD.
135. Pitman, E.M.#, **B.A. Needelman**, and #R.C. Crew. 2008. Predicting marsh loss and migration in the Blackwater National Wildlife Refuge using the Sea Level Affecting Marsh Model (SLAMM). Chesapeake Marshland National Wildlife Refuge Complex 5th Annual Science Meeting, April 9, Wye Mills, MD.
136. Jaffe, V.B., M.C. Rabenhorst, **B.A. Needelman**, and B. James. 2008. Effect of temperature and organic carbon on the development of reducing conditions in soils. Soil Science Society of America International Annual Meetings, Madison, WI.
137. Ruppert, D.E.#, **B.A. Needelman**, P.J.A. Kleinman, M.C. Rabenhorst, B. James, B. Momen, and A.L. Allen. 2008. P Flux in Ditch Soil Mesocosms: the Effects of Pedologic and Hydraulic Treatments. Soil Science Society of America International Annual Meetings, Madison, WI.
138. Poffenbarger, H.#, and **B.A. Needelman**. 2009. Are brackish marshes greenhouse gas sources or sinks? Undergraduate Research Day, University of Maryland, College Park, MD.
139. Bickford, W.A.#, **B.A. Needelman**, R.R. Weil, A.H. Baldwin, and J.P. Megonigal. 2009. Above and belowground vegetative response to prescribed fire in Mid-Atlantic brackish marshes. Coastal and Estuarine Research Federation 20th Biennial Conference, November 1–5, Portland, OR.

140. Geatz, G.W.# IV, **B.A. Needelman**, R.R. Weil, and M.C. Rabenhorst. 2009. Organic matter decomposition response to prescribed burns in Mid-Atlantic marshes. Coastal and Estuarine Research Federation 20th Biennial Conference, November 1–5, Portland, OR.
141. Ruppert, D.E.#, **B.A. Needelman**, M.C. Rabenhorst, B. James, P.J.A. Kleinman, and B. Momen. 2009. P Mobility in Ditch Soil Mesocosms. Soil Science Society of America International Annual Meetings, Madison, WI.
142. **Needelman, B.A.** 2011. Realism, implementation, climate change, and coastal wetland ecosystem services. 21st Biennial Conference of the Coastal and Estuarine Research Federation, Nov. 6–10, Daytona Beach, FL.
143. Lundberg, D.J.#, and **B.A. Needelman**, P.T. Leisnham. 2011. Hydrology of restored Atlantic Coast and Chesapeake Bay grid-ditched marshes. 21st Biennial Conference of the Coastal and Estuarine Research Federation, Nov. 6–10, Daytona Beach, FL.
144. Lundberg, D.J.#, and **B.A. Needelman**. 2012. Ecohydrological linkages of eastern shore Maryland coastal marshes: A two part assessment on the conditions of parallel ditched marshes. Geological Society of America International Annual Meeting, Nov. 4–7, Charlotte, NC.
145. Goldman, M.A.# and **B.A. Needelman**. 2012. Developing a GIS-based approach to siting and designing artificial nitrogen sinks in agricultural watersheds. Soil Science Society of America International Annual Meetings, Oct. 21–24, Cincinnati, OH.
146. Leuchanka, N., M. Paolisso, **B.A. Needelman**, S. Land, L. Wainger. 2014. Facilitating a collaborative learning approach in socio-ecological research to increase coastal marsh resilience to sea level rise on the Chesapeake Bay. ASLO, AGU, TOC Ocean Sciences Meeting, Feb. 23–28, Honolulu, HI.
147. Leuchanka, Natallia, Michael J. Paolisso, Lisa Wainger, **Needelman, B.A.**, Katherine J. Johnson, Patricia Delgado, Sasha Land, Robert Tjaden, Diane Leason. 2013. Socio-economic assessment and coastal marsh resilience on the Chesapeake Bay. Coastal and Estuarine Research Federation (CERF), Nov. 3–7, San Diego, CA.
148. Addy, K., N. Sacha, J. Raval, A.J. Gold, L. Schipper, M.B. David, and **B.A. Needelman**. 2013. Advancing the Adoption of Artificial Nitrogen Sinks. Soil Science Society of America International Annual Meetings, Nov. 3–6, Tampa, FL.
149. Lundberg, D.J.#, and **B.A. Needelman**. 2013. Ecohydrological linkages of Eastern Shore Maryland coastal marshes: A two part assessment on the conditions of parallel ditched marshes, Maryland Eastern Shore. Maryland Water Monitoring Council, Dec. 5th, Maritime Institute, North Linthicum, MD.
150. Lundberg, D.J.#, **B.A. Needelman**, and K. Prestegaard. 2014. Hydrology of Ditched and Unditched Atlantic Coast and Chesapeake Bay Marshes, Maryland Eastern Shore. Atlantic Estuarine Research Society, March 27–29, Ocean City, MD.
151. Goldman, M.A.#, and **B.A. Needelman**. 2014. Mapping Soil Hydrologic Conditions Using Soil Survey, Environmental Data, and Spatial Disaggregation Techniques. Soil Science Society of America International Annual Meetings, Nov. 2–5, Long Beach, CA.
152. Palardy, C., M.C. Rabenhorst, **B.A. Needelman**, S. Yarwood, M. Lang, and G. McCarty. 2014. Organic Matter Decomposition in Restored and Natural Wetlands. Soil Science Society of America

International Annual Meetings, Nov. 2–5, Long Beach, CA.

153. Derby, R.K.#, **B.A. Needelman**, J.P. Megonigal, and J. Morris. 2015. Validating a model for methane emissions in brackish marshes for use in carbon crediting. Society of Wetland Scientists Annual Meetings, May 31–June 4, Providence, RI.
154. **Needelman, B.A.**, M.H. Stolt, D. Beaudette, P. Drohan, J. Galbraith, J. Hempel, D. Lindbo, C. Monger, A. O'Geen, M.C. Rabenhorst, M. Ransom, and J. Shaw. 2015. Overview of the Fundamental Changes in Soil Taxonomy Task Force. National Cooperative Soil Survey Conference, June 7–11, Duluth, MN.
155. Fanning, D.S., M.C. Rabenhorst, **B.A. Needelman**, M. Levin, T. Reinsch, and W.L. Daniels. 2015. Eighth International Acid Sulfate Soils Conference at University of Maryland. National Cooperative Soil Survey Conference, June 7–11, Duluth, MN.
156. Davis, B., S.B. Mirsky, **B.A. Needelman**, M.A. Cavigelli, J. Spargo, and H. Poffenbarger. 2015. Nitrogen Use. Efficiency in Cover-Crop Based Corn Production, Soil Science Society of America Annual Meetings, Nov. 15-18, Minneapolis, MN.
157. **Needelman, B.A.**, Greenhouse gas emissions from soils. 2016. Webinar on Newly Approved VCS Methodology for Tidal Wetland and Seagrass Restoration, Verified Carbon Standard Feb. 25. Webinar, 147 attendees.
158. **Needelman, B.A.** 2016. Socio-ecological systems, marshes, and lots of ditches. Farm to Phrag: Eastern Shore Research Network. Socio-environmental Synthesis Center, Feb. 26, Annapolis, MD.
159. Davis, B.#, S.B. Mirsky, J. Spargo, H. Poffenbarger, M.A. Cavigelli, and **B.A. Needelman**. 2017. Liebig's Law of the Minima: Interpreting Nutrient Response in 2 Dimensions. American Society of Agronomy Annual Meetings, Oct. 22-25, Tampa, FL.
160. Oikawa, P. Y., Holmquist, J. R., Megonigal, P., Russell, S., Knox, S., Najarro, M., Windham-Myers, L., Stuart-Haëntjens, H.J., McNicol, G., **Needelman, B.**, Sihi, D., Forbrich, I., Tang, J., Bridgham, S., Lonneman, M., Wolfe, J., Fluet-chouinard, E., Arias-Ortiz, A. (2020, December). United States Methane Budget from Tidal Wetlands: Developing an Open-source Database of Methane Measurements and Process-based Models. In AGU Fall Meeting 2020. AGU.

II.E.10. Non-Refereed Panels

II.E.11. Symposia

Stolt, M.H., and **B.A. Needelman**. 2014. Fundamental Changes in Soil Taxonomy. Soil Science Society of America International Annual Meetings, Nov. 2–5, Long Beach, CA.

II.E.12. Workshops

II.E.13. Colloquia

II.E.14. Historical Conferences, Workshops, Talks (10+ years ago)

II.E.15. Other

II.F. Professional Publications

II.F.1. Reports and Non-Refereed Monographs

1. Maguire, R.O.^, **B.A. Needelman**, and P.A. Vadas. 2005. Drainage ditch management. In Phosphorus Best Management Practices: Protecting Water Quality. Southern Extension Research

Activity-Information Exchange Group-17. [Online]. Available online at http://www.sera17.ext.vt.edu/Documents/BMP_drainage_ditch.pdf.

2. **Needelman, B.A.**[^], S. Iyappan[#], M.C. Rabenhorst, and R.R. Weil. 2005. Wetlands. p. 162–176. In The Midwest Regional Carbon Sequestration Partnership (MRCSP): Phase I Final Report. Batelle, Columbus, OH. [Online]. Available online at <http://198.87.0.58/PhaseIReport.aspx>.
3. **Needelman, B.A.**[^], and S.A. Wills[#] (eds.) 2006. Improved management of agricultural drainage ditches for water quality protection: Field tour guide. University of Maryland, College Park, Maryland.
4. **Needelman, B.A.**[^], A.L. Allen, P.J.A. Kleinman, and R.B. Bryant. 2008. Managing Delmarva agricultural drainage ditches for water quality protection. [Fact sheet] University of Maryland, College Park, Maryland.
5. National Energy Technology Laboratory. 2010. Best practices for: Terrestrial sequestration of carbon dioxide. U.S. Department of Energy. Available at http://www.netl.doe.gov/technologies/carbon_seq/refshelf/BPM_Terrestrial.pdf.
 - a. Authored section entitled “Terrestrial Sequestration Field Test: Wetlands”; p. 40–42
6. Tjaden, R.[^], **B.A. Needelman**, and N. Stewart. 2012. Defining ecosystem services. University of Maryland Extension Fact Sheet 631, College Park, Maryland.
7. **Needelman, B.A.**[^], W.A. Bickford[#], G.W. Geatz[#], A.H. Baldwin, R.R. Weil, and J.P. Megonigal. 2012. Why do prescribed burns stimulate marsh plant growth? University of Maryland, College Park, Maryland.
8. **Needelman, B.A.** 2014. Carbon Sequestration and Methane Emissions in Tidal Marshes at the Blackwater NWR, Maryland (Region 5). In Biological Carbon Sequestration Accomplishments Report 2009–2013. P. 20–21. U.S. Fish and Wildlife Service.
9. Emmer, I.[^], **B.A. Needelman**, S. Crooks, and S. Emmett-Mattox. 2014. Greenhouse Gas Offset Methodology Criteria for Tidal Wetland Conservation. Commission for Environmental Cooperation, 36 pp., Montreal, Canada.

II.F.2. Pre-Print/Working Paper (Not Work in Progress)

II.F.3. Legal Briefs

II.F.4. Policy Briefs

II.F.5. Other

II.G. Book Reviews, Notes, and Other Contributions

II.G. 1. Book Reviews

II.G. 2. Essays

1. **Needelman, B.A.** 2014. Champions: A soil science publicity success story. Soil Horizons. doi:10.2136/sh2014-55-2-rc2

II.G. 3. Notes

II.G. 4. Manuals

II.G. 5. Other

II.H. Completed Creative Works

- II.H.1. Digital Media (e.g., CDs, DVDs)
- II.H.2. Datasets
- II.H.3. Constructed Projects
- II.H.4. Demonstrations
- II.H.5. Inventions
- II.H.6. Original Plans and Designs
- II.H.7. Photography
- II.H.8. Software and Applications
- II.H.9. Websites
- II.H.10. Exhibitions and Installations
- II.H.11. Curatorial Practice
- II.H.12. Performance or Interpretation – Performing Arts
- II.H.13. Direction - Performing Arts
- II.H.14. Production - Performing Arts
- II.H.15. Costume, Stage, Multimedia, and Theatrical Design
- II.H.16. Artistic and Graphic Design
- II.H.17. Dramaturgy
- II.H.18. Artwork
- II.H.19. Choreography
- II.H.20. Playwriting, Screenwriting, and Musical Composition
- II.H.21. Works of Creative Writing
- II.H.22. Performance or Interpretation - Film, Video, and Multimedia
- II.H.23. Direction - Film, Video, and Multimedia
- II.H.24. Production - Film, Video, and Multimedia
- II.H.25. Citations and Reviews
- II.H.26. Historical Completed Creative Works (10+ years ago)
- II.H.27. Other

II.I Significant Works in Public Media

Specify the following – Title, Publication/Media Name, Contributors, Types (Print, online, broadcast, video, documentary)

- II.I.1. Explanatory, Investigative, or Long-Form Journalism
- II.I.2. Other Significant Journalism
- II.I.3. Commentary/Analysis
- II.I.4. Interactive Online Database
- II.I.5. Other

II.J. Sponsored Research

List source, title, amount awarded, time period and role (i.e. principal investigator or co-investigator) in reverse chronological order or its inverse. If there are co-investigators, please list these.

II.J.1. Grants

35,000 – LIDAR topographic data for soil landscape analysis

10/01/02 – 9/30/04

USDA, Natural Resources Conservation Service, Soil Landscape Analysis Program

- Project Investigator

\$3,500 – Nutrient transport in ditch-drained agroecosystems

7/03–9/04

UMD General Research Board, Research Support Award

- Project Investigator

- University competitive

\$530,000 – Drainage ditch management to mitigate nutrient loss from agroecosystems

9/15/03 – 9/14/07

USDA-Cooperative State Research, Education, and Extension Service (CSREES), National Integrated Water Quality Program

- Project Investigator
- Co-PI's: Frank Coale, UM; Arthur L. Allen, University of Maryland Eastern Shore; John McCoy, Maryland Department of Natural Resources
- National competitive

\$14,950 – Fingerprinting sediment to determine sources in an urban watershed

3/1/05 – 2/28/06

Maryland Water Resources Research Center

- Project Investigator
- Co-PI's: Allen C. Gellis, USGS and Jerry C. Ritchie, USDA-ARS, Beltsville, MD
- Regional competitive

\$70,000 – Soil carbon in an urban ecosystem: How does urbanization affect soil carbon and microbial communities?

8/15/05 – 8/14/08

USDA Agricultural Research Service

- Project Investigator
- Co-PI's: Lewis Ziska, USDA Agricultural Research Service, Beltsville, MD

\$27,800 – Improved management of agricultural drainage ditches for water quality protection

6/15/06 – 6/14/07

Keith Campbell Foundation for the Environment

- Project Investigator
- Co-PI: Kevin Sellner – Chesapeake Research Consortium.
- Grant routed through the Chesapeake Research Consortium; \$9,188 dispersed to the University of Maryland as a subcontract
- Regional competitive

\$25,000 – Bioassessment of ecological function of agricultural ditches on the Delmarva Peninsula

7/01/07 – 6/30/08

Maryland Agriculture Experiment Station

- Co-Project Investigator
- PI: William Lamp, UM; co-PI: Joshua McGrath, UM
- College competitive

\$136,439 – Prescribed burns in the sustainable conservation and restoration of tidal marshes

2/01/09 – 1/31/2011

Maryland Sea Grant

- Project Investigator
- Co-PI: Raymond Weil and Andrew Baldwin (UM); Patrick Megonigal – Smithsonian Environmental Research Center
- State competitive (including DC)

- \$4,104 – The effects of future global change on arbuscular mycorrhizal fungi and soil carbon
 09/08/2009 – 09/30/2010
Urban Ecology Research Learning Alliance, Chesapeake Watershed Cooperative Ecosystem Studies Unit
- Project Investigator
 - Lead-authored by doctoral student Julie Wolf
 - Regional competitive
- \$600,000 (ENST \$80,000) – Efficacy, Constraints And Uncertainties Of Constructed Wetlands And Bioreactors: A Place-Based, Integrated Approach To Foster N Abatement
 09/30/11 – 8/30/15
USDA, National Institute of Food and Agriculture
- Co-Project Investigator
 - UM portion: \$80,000
 - PI: Arthur Gold, Univ. of Rhode Island; Co-PI's: Louis Schipper, University Of Waikato, New Zealand, Mark David, University of Illinois, Kelly Addy, University of Rhode Island.
 - National competitive
- \$30,000 – Ecological and social responses to grid-ditched coastal marsh restoration
 07/01/11 – 6/30/12
University of Maryland, Agricultural Experiment Station
- Project Investigator
 - Co-PI's: Paul Leisnham, Andrew Baldwin, Michael Paolisso, Robert Tjaden, Univ. of Maryland.
 - College competitive
- \$26,140 – Ecohydrology of Ditch-Drained Coastal Marshes
 03/1/11 – 2/28/13
USGS, Maryland Water Resources Research Center
- Project Investigator
 - Co-PI's: Paul Leisnham, Andrew Baldwin, Univ. of Maryland.
 - Proposal co-authored by doctoral student Dorothea Lundberg
 - State competitive
- \$598,645 (ENST \$361,861) – Socio-ecological research and collaborative learning to promote marsh and community resilience
 09/01/12 – 8/31/14
NOAA National Estuarine Research Reserve System (NERRS), Science Collaborative Program
- Project Investigator
 - Co-PI's: Michael Paolisso (Anthropology); Patricia Delgada (NOAA NERRS); Paul Leisnham, Andrew Baldwin, Robert Tjaden (ENST); Lisa Wainger, Univ. of Maryland Center for Environmental Science.
 - National competitive
- \$25,000 – Integrating Cultural Knowledge, Social Networks, Livelihood Strategies and Environmental Science to Foster Coastal Resilience to Climate Change at Multiple Scales
 06/01/14 – 11/30/15
UMD College of Behavioral & Social Sciences internal competition
- Co-Project Investigator
 - PI: Michael Paolisso (Anthropology); Co-PIs: Christina Prell (Sociology), Klaus Hubacek (Geographical Sciences)

\$50,000 – Digital soil disaggregation in a low-relief landscape to support wetland restoration decisions
09/15/14 – 09/30/16
USDA-Natural Resources Conservation Service

- Project Investigator
- National competitive

\$30,000 – Increasing the Socio-Ecological Resilience of the Deal Island Peninsula to Climate Change Impacts
01/01/15 – 6/30/16
University of Maryland, Agricultural Experiment Station

- Project Investigator
- Co-PI's: Paul Leisnham, Andrew Baldwin, Robert Tjaden, Michael Paolisso, Univ. of Maryland.
- College competitive

\$140,000 – Integrated Geospatial, Cultural, and Social Assessment of Coastal Resilience to Climate Change
2/1/16 – 1/31/2018
Maryland Sea Grant

- Co-Project Investigator
- PI: Michael Paolisso, Anthropology; Co-PIs: Christina Prell, Sociology; Klaus Habucek, Geography; Sasha Land, Chesapeake Bay National Estuarine Research Reserve-Maryland; Jennifer Dindinger, University of Maryland Extension.
- State competitive (including DC)

\$14,800 – The Maryland Winter Cover Crop Program: Assessing Performance
7/24/17 – 5/31/2019
SARE (Sustainable Agriculture Research & Education)

- Faculty Adviser
- Graduate Student Award for Brian Davis
- Regional competitive

\$300,000 – Linking Rural Decision-Makers with Local Churches to Build Coastal Resilience to a Changing Climate
7/1/17 – 8/30/2019
NOAA Coastal and Ocean Climate Applications

- Co-Project Investigator
- PI: Michael Paolisso, Anthropology; Co-PIs: Christina Prell, Geography; Klaus Habucek, Geography; Fredrika Moser, Maryland Sea Grant; Victoria Chanse, Plant Science and Landscape Architecture; Jo Johnson, Anthropology; Jennifer Dindinger, University of Maryland Extension.
- State competitive (including DC)

\$2,003,778 (UMD \$305,604) – Real-time Farmer Learning on Benefits of Cover Crops for Managing Soil Health, Economics, and Water and Nutrient Dynamics
10/1/20 – 4/07/2024
USDA-NRCS Conservation Innovation Grants

- Co-Project Investigator
- PI: Chris Reberg-Horton, NC State; Co-PIs: Steven Mirsky, USDA ARS, Roderick Rejesus, NC State, Miguel Cabrera, Univ. of Georgia
- Additional non-federal contributions committed: \$1,563,055
- National competitive

II.J.2. Contracts

\$3,000 – NASA Globe education program
2002

NASA Goddard

- Project Investigator

\$80,000 – Subcontract with University of Maryland to provide support to the Midwest Regional Carbon Sequestration Partnership

4/1/04 – 9/30/05

U.S. Department of Energy (through Batelle)

- Project Investigator
- Co-PI's: Raymond R. Weil, Martin C. Rabenhorst, and Sumathi Iyappan, UM

\$45,000 – Carbon pools in restored tidal marshes at Blackwater National Wildlife Refuge

9/12/05 – 8/31/07

Maryland Department of Natural Resources, Power Plant Research Program

- Project Investigator
- Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM; Donald R. Cahoon, U.S. Geological Survey, Beltsville, MD; Dixie L. Birch – U.S. Fish & Wildlife Service, Chesapeake Marshlands National Wildlife Refuge Complex
- Dispersed in two increments

\$20,000 – Carbon pools in restored tidal marshes at Blackwater National Wildlife Refuge

10/1/05 – 9/30/06

Maryland Energy Administration

- Project Investigator
- Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM; Donald R. Cahoon, U.S. Geological Survey, Beltsville, MD; Dixie L. Birch – U.S. Fish & Wildlife Service, Chesapeake Marshlands National Wildlife Refuge Complex

\$200,000 – Carbon sequestration in restored tidal marshes at Blackwater National Wildlife Refuge

06/05/06 – 3/31/11

Maryland Department of Natural Resources, Power Plant Research Program

- Project Investigator
- Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM
- Dispersed in multiple increments

\$23,210 – Climate change impacts and coastal habitat restoration

12/18/07 – 11/21/08

Restore America's Estuaries

- Project Investigator

\$50,000 – Carbon sequestration in Maryland tidal marshes

02/01/11 – 1/31/12

Maryland Department of Natural Resources, Power Plant Research Program

- Project Investigator
- Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM

- \$23,000 (ENST \$0) – Influence of Methane Emissions on the Net Radiative Forcing of Restored Tidal Marshes
10/1/11 – 1/31/13
Maryland Department of Natural Resources, Power Plant Research Program
- Co-Project Investigator
 - PI: J. Patrick Megonigal, Smithsonian Environmental Research Center
- \$50,000 – Carbon sequestration in Maryland tidal marshes
09/01/11 – 3/31/13
Maryland Department of Natural Resources, Power Plant Research Program
- Project Investigator
 - Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM
- \$141,861 – Nitrogen cycling and greenhouse gas emissions in cover crop-based organic rotational no-till
09/13/12 – 8/31/15
USDA Agricultural Research Service, Beltsville Agricultural Research Center
- Project Investigator
 - Cooperative agreement
- \$50,000 – Carbon sequestration in Maryland tidal marshes
09/01/12 – 6/30/14
Maryland Department of Natural Resources, Power Plant Research Program
- Project Investigator
 - Co-PI's: Martin C. Rabenhorst and Raymond C. Weil, UM
- \$40,000 – Nitrogen cycling and greenhouse gas emissions in cover crop-based organic rotational no-till
09/20/12 – 9/20/13
USDA Agricultural Research Service, Beltsville Agricultural Research Center
- Project Investigator
 - Cooperative agreement
- \$50,000 – Carbon sequestration in Maryland tidal marshes
09/01/13 – 6/30/15
Maryland Department of Natural Resources, Power Plant Research Program
- Project Investigator
- \$50,000 – Carbon sequestration in Maryland tidal marshes
09/01/14 – 6/30/16
Maryland Department of Natural Resources, Power Plant Research Program
- Project Investigator
- \$50,000 – The Role of Cover Crop Species and Establishment Method on Biomass Accumulation, Nitrogen Scavenging, and Greenhouse Gas Emissions
08/25/2015 - 08/24/2020
USDA Agricultural Research Service, Beltsville Agricultural Research Center
- Project Investigator
 - Cooperative agreement
- \$50,000 – Carbon sequestration in Maryland tidal marshes
08/01/15 – 12/31/16

Maryland Department of Natural Resources, Power Plant Research Program

- Project Investigator

\$50,000 – Carbon sequestration in Maryland tidal marshes

7/01/16 – 12/31/18

Maryland Department of Natural Resources, Power Plant Research Program

- Project Investigator

\$632,767 – An Integrated Pest Management Approach to Addressing the Multiple Herbicide-resistant Weed Epidemic in U.S. Field Crop Production-MD

08/25/2015 - 08/24/2020

USDA Agricultural Research Service, Beltsville Agricultural Research Center

- Project Investigator
- Cooperative agreement
- Account transferred to me 10/2018

II.J.3. Other

II.K. Fellowships, Gifts and Other Funded Research

II.K.1. Fellowships

II.K.2. Gifts

\$100,000 – Blackwater National Wildlife Refuge tidal marsh carbon sequestration project

7/07

Constellation Energy

- Project Investigator
- Unrestricted gift

II.K.3. Other

II.L. Submissions and Works in Progress

List press, journal, or granting agency.

II.L.1. Current Grant Applications

II.L.2. Manuscripts in Preparation

II.L.3. Manuscripts under Review (*indicate status: submitted or revising to resubmit*)

II.L.4. Working Papers in Preparation

II.L.5. Designs in Preparation

II.L.6. Other

II.M. Centers for Research, Scholarship, and Creative Activities

Specify Name of the Center, Description of Center, Collaborators, Start and End Dates.

II.M.1. Centers Established

II.M.2. Centers Directed

II.M.3. Symposia Organized (*through center*)

II.M.4. Other

II.N. Patents

II.N.1. Device

II.N.2. Other

II.O. Other Research/Scholarship/Creative Activities

III. Teaching, Mentoring and Advising.

III.A. Courses Taught 2017–present

ENST 301/302/303 – Field Soil Morphology – Fall 2017, 2019

- Training for and competition at the Northeast Regional Collegiate Soil Judging Contest
- Primarily a field-based course

ENST 309 — Advanced Field Soil Morphology, Spring 2018, 2020

- Training for and competition at the National Collegiate Soil Judging Contest
- Won National Championship in 2013
- Primarily a field-based course

ENST 414 – Soil Morphology, Genesis and Classification – Fall 2017–21

ENST 702 – Environmental Science and Technology: Communication and Professional Development–
Spring 2018–22

III.B. Teaching Innovations

III.B.1. Major Programs Established

III.B.2. Education Abroad Established

III.B.3. Software, Applications, Online Education, etc.

III.B.4. Instructional Workshops and Seminars Established

III.B.5. Course or Curriculum Development

ENST 414 – Soil Morphology, Genesis and Classification – 2013 & 2015

- Performed course restructure
- Developed and implemented online participation activities through ELMS
- Increased formal collaborative learning activities in course including think-pair-share, small-group discussion, and problem-based learning
- Adapted course to new textbook edition

ENST 414 – Soil Morphology, Genesis and Classification – 2018

- Performed course restructure
- Developed and implemented online participation activities through ELMS
- Increased formal collaborative learning activities in course including think-pair-share, small-group discussion, and problem-based learning
- Removed textbook as mandatory reading and replaced with targeted readings

III.B.6. Historical Innovations (10+ years ago)

III.B.7. Other

LARC 471 Capstone Studio: Community Design

- Visiting instructor, 3/13/14

III.C. Advising: Research or Clinical

This refers to students whose projects the faculty has supervised as adviser, committee chair, or committee member (indicate role). The name of student, academic year(s) involved, and the name of institution if other than UMD should be indicated, as well as placement of the student(s), if the project is completed. List completed work first.

III.C.1. Undergraduate

Katherine Burgy, Undergraduate research assistant (URAP), 2003

Sandra Grabowski, College Park Scholar, 2003

Gemstone Program Senior Team Thesis Conference, Phosphorus Agriculture Runoff Management, discussant, 4/1/06

George Geatz, Independent Research Study (ENST 489), 2008

- Presented seminar entitled “Prescribed burning effects on soil carbon levels in a brackish tidal marshland” in the Spring 2008 Pedology-Fertility-Chemistry Research Meetings

Elise Pittman, ENSP intern, 2008

- Presented research at the Chesapeake Marshland National Wildlife Refuge Complex 5th Annual Science Meeting, April 9, Wye Mills, MD in a presentation entitled “Predicting marsh loss and migration in the Blackwater National Wildlife Refuge using the Sea Level Affecting Marsh Model (SLAMM)”
- 2nd place presentation, Geography Department Undergraduate Research Day, University of Maryland.

Hanna Poffenbarger, Undergraduate intern, 2007–2009

- Lead-authored manuscript for submission to the peer-reviewed journal *Wetlands* entitled “Salinity influence on methane emissions from tidal marshes.” based on her research on methane emissions across salinity gradients in vegetated coastal wetlands.
- Presented seminar entitled “A meta-analysis investigation of sulfate inhibition of methanogenesis in marsh soils” in the Fall 2008 Soils Research Meetings (the only sophomore ever to present in this series)

Emily Hutchins, ENSP intern, 2008; undergraduate intern, 2009–2010

- Presented seminar entitled “Methodology for marsh vegetation response to prescribed burns study” in the Fall 2008 Soils Research Meetings

Miriam Myers, Undergraduate intern, 2008–11

- Presented seminar entitled “Quantifying marsh sulfide concentrations using IRIS tubes along a salinity gradient” in the Fall 2008 Soils Research Meetings

Anastasia Vinnikova, ENSP intern, 2009

- Presented seminar entitled “The effect of prescribed burns on the soil strength and bulk density of salt marsh soils” in the Fall 2009 Soils Research Meetings

Michele Miller, Undergraduate intern, 2009

- Presented seminar entitled “Light availability and soil temperature in marsh burn study” in the Fall 2009 Soils Research Meetings

Laurence Gindi, Undergraduate intern, 2012–2013

- Co-presented seminar entitled “Ditch-drained marshes from the sky, the mud, and the social scientists” in the Fall 2012 Soils Research Meetings

Jonathan Vocke, Undergraduate intern, 2012–2013

- Co-presented seminar entitled “Ditch-drained marshes from the sky, the mud, and the social scientists” in the Fall 2012 Soils Research Meetings

Kevin Willson, Undergraduate intern, 2012–2013

- Co-presented seminar entitled “Ditch-drained marshes from the sky, the mud, and the social scientists” in the Fall 2012 Soils Research Meetings

Zoe Rosenblum, Undergraduate intern, 2013

- Research on ditch-drained marshes

Sergio Torres, Undergraduate intern, 2014

- Research on ditch-drained marshes

Sara Mack, Honors Thesis Committee, member, 2014

- Thesis entitled “The Decomposition Stick: A Viable Substrate for Quantifying Organic Matter Decomposition Rates in Soils”

Zachary Spencer, Undergraduate intern, 2015

- Research on ditch-drained marshes

Chris Seitz, Undergraduate intern, 2015

- Research on digital soil disaggregation in a low-relief landscape to support wetland restoration decisions

Chenglin, Zhu, Undergraduate intern, 2015

- Research on ditch-drained marshes

III.C.2. Master's

Major Adviser

Robert Vaughan, M.S. in Natural Resource Sciences, Soil Science

- Thesis title: Agricultural drainage ditches: Soils and implications for phosphorus transport and retention
- 2002–2005; graduated 2005

Mitchell Scott, M.S. in Natural Resource Sciences, Soil Science

- Thesis title: Mapping and characterization of the Marlboro Clay formation
- 2002–2006; graduated 2006

Olivia Devereux, M.S. in Natural Resource Sciences, Soil Science

- Thesis title: Quantifying fine sediment sources in the Northeast Branch of the Anacostia River, Maryland, using trace elements and radionuclides
- 2004–06; graduated 2006

Wesley Bickford, M.S. in ENST: Wetland Science

- Research: Vegetation response to prescribed fire in Mid-Atlantic tidal marshes
- 2009–2011; graduated 2011

George Geatz, M.S. in ENST: Wetland Science

- Research: Organic matter decomposition rates as affected by prescribed burns in tidal marshes
- 2009–2012; graduated 2012

Brian Davis, M.S. in ENST: Soil and Watershed Science

- Research: Characterizing nitrous oxide emissions in a no-till corn rotation with subsurface banded poultry litter and rye/vetch mulches
- Co-advised with Dr. Steven Mirsky
- 2012–2017; graduated 2017

Christopher Chapman, M.S. in Conservation Biology (non-thesis)

- Paper title: Agriculture practices, bulk carbon, and their impacts in the Mid-Atlantic region
- 2012–2013; graduated 2012

Caron Gala, M.S. in ENST: Soil and Watershed Science

- Research: Informal education of fundamental pedological principles
- 2013–2017 (changed major adviser)

R. Kyle Derby, M.S. in ENST: Wetland Science

- Research: Validating a model for methane emissions in brackish marshes for use in carbon crediting
- 2014–2016; graduated 2016

Other service on graduate committees

| <u>Student</u> | <u>Degree</u> | <u>Program</u> | <u>Years</u> |
|-----------------------|---------------|----------------|----------------------------------|
| 1. Karen Castenson | M.S. | Soil Science | 2002–2003 |
| 2. Cary Coppock | M.S. | Soil Science | 2002–2009 (withdrew) |
| 3. Philip Zurheide | M.S. | Soil Science | 2002–2008 |
| 4. Rosalynd Orr | M.S. | Soil Science | 2004–2009 (withdrew) |
| 5. Patrick Morton | M.S. | Soil Science | 2004–2006 (withdrew) |
| 6. Adam Gray | M.S. | Soil Science | 2005–2010 |
| 7. Antti Koskelo | M.S. | MEES | 2005–2008 |
| 8. Rebecca Bourgault | M.S. | Soil Science | 2005–2008 |
| 9. Jennifer Brundag | M.S. | MEES | 2007–2009 (changed thesis topic) |
| 10. Michelle Hetu | M.S. | ENST: Soils | 2007–2011 (withdrew) |
| 11. Dan Fenstermacher | M.S. | ENST: Soils | 2009–2011 |
| 12. Loretta Collins | M.S. | ENST: Soils | 2012–2014 |
| 13. Chris Palardy | M.S. | ENST: Soils | 2013–2017 |
| 14. Sara Mack | M.S. | ENST: Soils | 2015–2018 |
| 15. Dani Weissman | M.S. | Plant Science | 2016–2017 |
| 16. Evan Park | M.S. | ENST: Soils | 2019–2021 |
| 17. Jordan Kim | M.S. | ENST: Soils | 2020–present |

III.C.3. Doctoral

Major Adviser

David Ruppert, Ph.D. in Natural Resource Sciences, Soil Science

- Dissertation title: Redox and soil manipulation effects on ditch soil phosphorus processing
- 2004–2012; graduated 2012

Julie Wolf, Ph.D. in Natural Resource Sciences, Soil Science

- Dissertation title: The effects of future global change on arbuscular mycorrhizal fungi and soil carbon: Using urbanization as a surrogate for future conditions in field studies
- 2005–2012; graduated 2012
- Lead-authored 2009 grant awarded by Urban Ecology Research Learning Alliance (\$4,104)

Dorothea Lundberg, Ph.D. candidate in Marine, Estuarine and Environmental Science

- Research: Hydrology of ditch-drained tidal marshes
- 2011–2016; changed major adviser

Lisa Dosmann, Ph.D. candidate in ENST, Wetland Science

- Research: Organic matter decomposition in ditch-drained tidal marshes
- 2012–2013 (withdrew)

Margaret Goldman, Ph.D. candidate in ENST, Soil and Watershed Science

- Research: Digital soil disaggregation in a low-relief landscape to support wetland restoration decisions
- 2012–2018; graduated 2018

Brian Davis, Ph.D. in ENST: Soil and Watershed Science

- Research: Assessing Performance in Cover Crops

- Co-advised with Dr. Steven Mirsky
- 2017–2020 (withdrew to take full-time Data Scientist position)

Other service on graduate committees

| | <u>Student</u> | <u>Degree</u> | <u>Program</u> | <u>Years</u> |
|-----|-------------------|---------------|----------------|--------------|
| 1. | Danielle Balduff | Ph.D. | Soil Science | 2003–2007 |
| 2. | Allen Roberts | Ph.D. | Geography | 2006–2009 |
| 3. | John Majsztrik | Ph.D. | Plant Science | 2007–2011 |
| 4. | Alan Leslie | Ph.D. | Entomology | 2009–2014 |
| 5. | Ann Rossi | Ph.D. | ENST: Soils | 2010–2014 |
| 6. | Kate White | Ph.D. | Soil Science | 2010–2016 |
| 7. | Rebecca Fox | Ph.D. | MEES | 2011 |
| 8. | Brian Laub | Ph.D. | Biology | 2011 |
| 9. | Christy Hesel | Ph.D. | Anthropology | 2012–2016 |
| 10. | Katherine Johnson | Ph.D. | Anthropology | 2014–2016 |
| 11. | Jeremy Trombley | Ph.D. | Anthropology | 2014–2016 |
| 12. | Liz Van Dolah | Ph.D. | Anthropology | 2016–2018 |
| 13. | Barrett Wessel | Ph.D. | ENST : Soils | 2016–2020 |
| 14. | Jocelyn Wardrup | Ph.D. | ENST : Soils | 2021–present |

III.C.4. Post-doctoral

Skye Wills

- Research: Carbon sequestration in restored tidal marshes
- 2007–2008

III.C.5. Other Research Directions (*K-12 Interactions*)

III.D. Mentorship

III.D.1. Junior Faculty

Mentoring Committee for Joshua McGrath
Member, 2007–2011

Mentoring Committee for Stephanie Yarwood
Chair, 2012–2016

III.D.2. Other

III.E. Advising: Other than Research Direction

III.E.1. Undergraduate

Academic Adviser, 2015–2016

- Six advisees in Environmental Science and Technology program

III.E.2. Master's

III.E.3. Doctoral

III.E.4. Post-doctoral

III.E.5. Other Advising Activities

(Include advising student groups, special assignments, recruiting, etc.)

III.F. Professional and Extension Education

III.F.1. Professional Programs Established

III.F.2. Major Extension Programs

III.F.3. Workshops

III.F.4. Other

III.G. Other Teaching Activities

IV. Service and Outreach

IV.A. Editorships, Editorial Boards, and Reviewing Activities

Include participation for journals and other learned publications (print and electronic).

IV.A.1. Editorships

IV.A.2. Editorial Boards

IV.A.3. Reviewing Activities for Journals and Presses

Associate Editor, Soil Science Society of America Journal, 2008–2011

Reviewed up to eight journal articles per year. Journals included (alphabetically): Agronomy Journal; Biogeochemistry; Biogeosciences; Catena; Ecological Engineering; Estuaries and Coasts; Estuarine, Coastal and Shelf Science; Geoderma; Journal of Coastal Research; Journal of Environmental Quality; Journal of Freshwater Ecology; Journal of Soil and Water Conservation; Landscape Ecology; Nature Education; Soil Science; Soil Science Society of America Journal; Wetlands.

IV.A.4. Reviewing Activities for Agencies and Foundations

Invited reviewer for the National Institutes for Water Resources FY2006 National Competitive Grants Program.

Invited reviewer for USDA National Integrated Water Quality Program intensive grant writing workshop for Extension Education proposal, 2007.

Invited reviewer for Woods Hole Sea Grant Program, 2015

Invited reviewer for the ADVANCE Program for Inclusive Excellence 2015-2016 Interdisciplinary and Engaged Research Seed Grant Program

IV.A.5. Reviewing Activities for Conferences

IV.A.6. Historical Editorships, etc. (10+ years ago)

IV.A.7. Other

Invited review of textbook “Soils: Genesis and Geomorphology” by R.J. Schaetzl and S. Anderson, 2011

Invited reviewer for the Verified Carbon Standard for the addition of wetlands restoration and conservation to the Agriculture, Forestry and Other Land Use (AFOLU) Requirements, 2012

IV.B. Committees, Professional & Campus Service

IV.B.1. Campus Service – Department

Department of Natural Resource Sciences and Landscape Architecture

Computer Committee

Member, 2002–2005

Undergraduate Education Committee

Member, 2003–2004

Chair Search Committee

Member, 2004

Mentoring and Diversity Committee

Member, 2003–2005; Chair, 2004–2005

Merit Pay Committee

Member, 2006

Website Committee

Member, 2006

Department of Environmental Science and Technology

Graduate Committee
Member, 2006–2013
Doctoral Graduate Outcomes Assessment lead, 2011–2013
Faculty Hires Prioritization Committee
Member, 2007
Mentoring Committee for Joshua McGrath
Member, 2007–2011
Environmental Health Faculty Position Search Committee
Member, 2007–2008
Graduate Association for Technology and Environmental Science (GATES)
Faculty Liaison, 2007–2013
Marketing Committee
Member, 2008–2010
Faculty Salary and Review Committee
Member, 2009; Chair, 2010
Environmental Microbiology Faculty Position Search Committee
Chair, 2010–2011
Soil and Watershed Science Curricula Working Group
Chair, 2011–2012
Programs, Courses, and Curricula Committee
Member, 2012–2013
Mentoring Committee for Stephanie Yarwood
Chair, 2012–2016
Interim Associate Chair
2013–2016
Undergraduate Committee
2019–present
Faculty Review and Salary Committee
2020–2021

IV.B.2. Campus Service – College

College of Agriculture and Natural Resources
Programs, Courses, and Curricula Committee
Member, 2011
Undergraduate Researchers of the Year Award Committee
Nominee Reviewer, 2014

IV.B.3. Campus Service - University

University of Maryland
CORE Sciences & Mathematics Subcommittee
Member, 2004
Banneker/Key Scholarship Selection Committee
Member, 2008
Marine, Estuarine and Environmental Sciences Graduate Program
MEES Faculty, Regular Member, 2011–present
University Senate
Tenured Faculty Representative, College of Agriculture and Natural Resources, 2013–2016

IV.B.4. Campus Service - Special Administrative Assignment

IV.B.5. Campus Service - Other

IV.B.6. Offices and Committee Memberships

American Society of Agronomy

Soil Judging Committee, AS245
Past Chair, 2002; Chair, 2001

Mid-Atlantic Association of Professional Soil Scientists

Vice President (2004), President-elect (2005), President (2006), Past-President (2007), Vice President (2012), President-elect (2013), President (2014), Past-President (2015)

Soil Science Society of America

Smithsonian Soils Exhibit Committee

Member and MD State Liaison, 2002–2004

Soil Judging Contest Committee

Chair, 2001; Past Chair, 2002

Hydropedology Working Group, ACS 837 (joint committee with American Society of Agronomy and Crop Science Society of America)

Member, 2002–2008

Membership, Identity, and Visibility Committee, S236.1

Member, 2003–2004

Ad Hoc Committee on Professional Development and Mentoring

Chair, 2004–2006

Smithsonian Soils Exhibit, SSSA Design Committee

Member, 2005–2008

William H. Patrick Memorial Wetland Biogeochemistry Lectureship Committee

Member, 2006–2008; 2013–2015

Soil Science Society of America Journal

Associate Editor, 2008–2011

Wetland Soils Division

Chair-Elect, 2015; Chair 2016; Past Chair 2017

S536.1 Rapid Response Team

Member, 2014–2017

S201.4.12 SSSA Fundamental Changes in Soil Taxonomy Task Force

Co-chair, 2014–2017, member 2017–present

Soil Judging Contest Committee

International Soil Judging Contest Coordinator, 2021–23

Chesapeake Bay Program

Expert Panel to Define Pollutant Removal and Land Use Loading Rates for Agricultural Wetland Restoration and Enhancement

Member, 2014

Maryland Department of Natural Resources

Climate Change Advisory Group for Coastal Best Management Practice Targeting

Member, 2013–2015

Ecological Effects of Sea Level Rise Program, Management Transition Advisory Group & Marsh Modeling Workgroup

Member, 2019–2022

Maryland Regional Greenhouse Gas Initiative

Subgroup on Sequestration and Offset Projects

Member, 2007–2013

Maryland Sea Grant

Academic Advisory Committee
Member, 2012–2015

Smithsonian Institution

Extended Advisory Team, Soils Exhibit 2005–2008

USDA Natural Resources Conservation Service

Northeast Region Research Needs Committee

Experiment Station Member, 2002

National New Technology Standing Committee

Experiment Station Member, 2003

Northeast Region Soil Taxonomy Committee

State representative, 2014

USDA National Institute of Food and Agriculture

Multi-state Project NE1038 Hydropedology: Genesis, Properties, and Distribution of Hydromorphic Soils

Member, 2011–2013

U.S. Fish & Wildlife Service

Chesapeake Marshlands Environmental Restoration Technical Advisory Group

Member, 2007–2010

Adaptive Management Consultancy on Prescribed Burns

Member, 2008–2012

The Conservation Fund

Technical advisory committee on climate change adaptation at Blackwater National Wildlife Refuge

Member, 2011–2012

MADE-CLEAR (Maryland and Delaware Climate Change Education Assessment and Research)

Scientific Advisor, 2013–2015

Restore America's Estuaries

Working Group on Climate change and coastal habitat restoration

Chair, 2008–2012

Working Group on Tidal Wetland Restoration and Conservation Carbon Crediting Methodology

Member, 2012–21

National Blue Carbon Working Group

Member, 2015–present

IV.B.7. Leadership Roles in Meetings and Conferences

Organized symposium entitled "Managing Drainage Ditch Ecosystems on the Delmarva Peninsula at the University of Maryland Eastern Shore", July 15, 2005.

- 55 attendees from a range of private and public institutions
- Lead and co-authored 5 presentations (listed below)

Organized field tour and symposium entitled "Improved management of agricultural drainage ditches for water quality protection", Aug. 22–23, 2006.

- 110 attendees from a range of private and public institutions
- Lead-authored field tour guide. Guide and symposium presentations available online at: <http://www.sawgal.umd.edu/DrainageDitches/2006DitchTour.html>

Co-organized field tour entitled "Sea level rise and wetland loss at Blackwater National Wildlife Refuge", May 26, 2008, Society of Wetland Scientists 29th Annual Meeting.

Co-organized and co-hosted Northeast Regional Pedology Tour (Lead host Dr. Martin Rabenhorst), June 3–6, 2013.

- 40 participants from six Universities.

Restore America's Estuaries and The Coastal Society

National Program Committee (NPC) for the 7th National Summit on Coastal and Estuarine Restoration, Inspiring Action, Creating Resilience
Member, 2013–2014

Contributed to organizing and hosting of the 2013 National Cooperative Soil Survey National Conference, June 16–20, 2013, Annapolis, MD.

Organized and hosted tour of the Blackwater National Wildlife Refuge in Cambridge, MD for 13 Iranian academic scientists participating in the “Management of Wetlands and Marshes: A Project for Iran” program coordinated through the National Academy of Sciences and the State Department, March 15, 2016.

Member of organizing committee for the Eighth International Acid Sulfate Soils Conference held at the University of Maryland July 17–23, 2016.

IV.B.8. Other Non-University Committees, Memberships, Panels, etc.

IV.B.9. Historical Committees, etc. (10+ years ago)

IV.B.10. Other

Developed and maintained web server of soils data for Maryland NRCS used extensively by public users – The Electronic Field Office Technical Guide for Maryland, Delaware, and Washington, D.C., 2002–2010.

Provided technical expertise and support to the Maryland and Delaware National Cooperative Soil Survey Program, 2002–2015.

- Analyzed and processed terrain data for use in the Prince George’s County soil survey update
- Participated in soil survey field reviews

Co-organized The Ditch Project high school scholars summer internship summer program, 2005–2006.

- 20 high school students, primarily from groups underrepresented in the sciences, trained in geospatial information technology and water quality management during a two-week program held at the University of Maryland Eastern Shore

Organized and hosted Northeast Regional Soil Judging Contest, 2007.

Organized and hosted Northeast Regional Soil Judging Contest, Oct 22–25, 2013.

- Event featured in The Frederick News Post in a piece entitled “To win this one, play dirty”, 10/25/13

Speaker and event volunteer at the 3rd International Soil Judging Contest in Rio De Janeiro Brazil (Aug 7–11, 2018); associate coach of the U.S. National Team.

- U.S. Team placed first in the contest

IV.C. External Service and Consulting

IV.C.1. Community Engagements, Local, State, National, International

IV.C.2. International Activities

IV.C.3. Corporate and Other Board Memberships

IV.C.4. Entrepreneurial Activities

IV.C.5. Consultancies (*to local, state and federal agencies; companies; organizations*)

IV.C.6. Historical External Service and Consulting (10+ years ago)

IV.C.7. Other

IV.D. Non-Research Presentations

IV.D.1. Outreach Presentations

Outreach Presentations—invited

- **Needelman, B.A.** 2002. Phosphorus transport in the landscape. Advanced Phosphorus Conference, Maryland Nutrient Management Program – One day continuing education workshop for certified consultants. Oct. 16. Laurel, MD.
- **Needelman, B.A.** 2004. Soil survey interpretations used in the phosphorus site index. Advanced soil science: A one day continuing education workshop for certified consultants. Maryland Nutrient Management Program. July 8. Laurel, MD.
- **Needelman, B.A.** 2004. Surface runoff and drainage ditch impacts on water quality. Mid-Atlantic Regional Listening Session. National Agricultural Research, Extension, Education, and Economics (NAREEE) Advisory Board, USDA. Field tour stop and presentation. July 28. Princess Anne, MD.
- **Needelman, B.A.** 2004. Nutrient transport and drainage ditch management. 12th National Nonpoint Source Monitoring Workshop: Managing Nutrient Inputs and Exports in the Rural Landscape. Presentation and field tour stop. September 29. Princess Anne, MD.
- Scott, M.L., J. Brown, and **B.A. Needelman**. 2004. Soil survey in the District of Columbia regarding erosion control and storm water management. Workshop. April 24. Univ. D.C., Washington, DC.
- Scott, M.L., and **B.A. Needelman**. 2004. Explaining the behaviors of Greenbelt, MD's soils. Explorations Unlimited Workshop. April 16, 2004. Greenbelt Community Center, Greenbelt, MD.
- Vaughan, R.E., **B.A. Needelman**, and D.E. Ruppert. 2004. Drainage ditch management to mitigate nutrient loss from agroecosystems. Princess Anne Ruritans Club. Presentation and discussion. April 5. Princess Anne, MD.
- Ruppert, D.E., and **B.A. Needelman**. 2005. The Ditch Project. Maryland Department of Agriculture Public Drainage Association Ditch Managers meeting. Nov. 23. Salisbury, MD.
- **Needelman, B.A.** 2006. Ditch soils and restoring marshes at Blackwater. Mid-Atlantic Association of Professional Soil Scientists Annual Business Meeting. February 18, Dover, DE.
- **Needelman, B.A.** 2007. Carbon sequestration associated with wetland restoration. Chesapeake Bay Marshlands: Global Warming and Wetland Restoration in the Chesapeake Bay. May 30, Cambridge, MD.
- **Needelman, B.A.** 2007. Improving management of agricultural drainage ditches for water quality protection. Mid-Atlantic Crop Management School, Nov. 13, Ocean City, MD.

- **Needelman, B.A.**, and †R.C. Crew. 2008. Global warming, restoring marshes, and sinking Maryland! Presentation to 6th grade class at The Park School of Baltimore, Baltimore, MD.

Outreach Presentations—contributed

- Allen, A.L., and **B.A. Needelman**. 2005. Overview of the Ditch Project. Managing Drainage Ditch Ecosystems on the Delmarva Peninsula. University of Maryland Eastern Shore, July 15. Princess Anne, MD.
- Kleinman, P.J.A., A.N. Sharpley, A.L. Allen, and **B.A. Needelman**. 2005. Dynamics of nutrient transport in two drainage ditches on the UMES Research Farm. Managing Drainage Ditch Ecosystems on the Delmarva Peninsula. University of Maryland Eastern Shore, July 15. Princess Anne, MD.
- **Needelman, B.A.** 2005. Wetland and urban carbon sequestration demonstration sites for the Midwest Regional Carbon Sequestration Project. Maryland Energy Administration. June 30. Annapolis, MD.
- **Needelman, B.A.**, A.L. Allen, and P.J. Kleinman. 2005. Where do we go from here?. Managing Drainage Ditch Ecosystems on the Delmarva Peninsula. University of Maryland Eastern Shore, July 15. Princess Anne, MD.
- **Needelman, B.A.**, D. Cahoon, D. Birch, and B. Giese. 2005. Carbon sequestration in restored tidal marshes at Blackwater National Wildlife Refuge. Maryland Department of Natural Resources Power Plant Research Program. Aug. 16. Annapolis, MD.
- **Needelman, B.A.**, and F.J. Coale. 2005. Early observations from four ditch-drained farms. Managing Drainage Ditch Ecosystems on the Delmarva Peninsula. University of Maryland Eastern Shore, July 15. Princess Anne, MD.
- **Needelman, B.A.**, and R.E. Vaughan. 2005. Um, What's that black stuff? An explosive finding of concern in the drainage ditches. Managing Drainage Ditch Ecosystems on the Delmarva Peninsula. University of Maryland Eastern Shore, July 15. Princess Anne, MD.
- **Needelman, B.A.** 2008. How do prescribed burns stimulate plant growth? Presentation to U.S. Fish and Wildlife Service Region 5 Fire Management Officers and biology staff, Dec. 9, Cambridge, MD.
- Bickford, W.A., G.W. Geatz, and **Needelman, B.A.** 2009. Prescribed burns in the sustainable conservation and restoration of tidal marshes Presentation to U.S. Fish and Wildlife Service Chesapeake Marshlands National Wildlife Refuge Complex fire management and biology staff, Dec. 16, Cambridge, MD.
- Bickford, W.A., G.W. Geatz, and **Needelman, B.A.** 2009. Prescribed burns in the sustainable conservation and restoration of tidal marshes Presentation to U.S. Fish and Wildlife Service Chesapeake Marshlands National Wildlife Refuge Complex fire management and biology staff, Dec. 16, Cambridge, MD.
- **Needelman, B.A.** 2013. Ditch-drained marsh project: Ecological field research. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, March 11, Cambridge, MD.
- **Needelman, B.A.**, and M. Paolisso. 2013. Building marsh and community resilience on the

Deal Island Peninsula. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, April 5, Deal Island, MD.

- **Needelman, B.A.**, D. Leason, D. Lundberg, P. Leisnham, A. Baldwin, and P. Delgado 2013. Ecological research: Updates and linking to Collaborative Research Project work. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, Oct. 19, Chance, MD.
- **Needelman, B.A.** 2014. Hurricane Sandy Funding Proposal: Fingers crossed and a plan forward. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, Feb. 24, Winona, MD.
- **Needelman, B.A.** 2015. The Deal Island Marsh and Community Project: Next Steps. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, April 8, Deal Island, MD.
- **Needelman, B.A.** 2015. The Deal Island Marsh and Community Project: Overview and Next Steps. Presentation to the Deal Island Marsh and Community Project stakeholder workshop, Nov. 5, Chance, MD.

IV.D.2 Other

Provided technical expertise to staff members of Mr. Wayne Gilchrist, U.S. representative for Maryland's 1st District, on carbon sequestration in coastal wetlands, 6/20/07.

Provided technical expertise to staff member of Mr. Nick Rahall, U.S. representative for West Virginia's 3rd District, on carbon sequestration in coastal wetlands, 5/4/07. Following the meeting Mr. Rahall introduced Bill HR 2337 to the House Committee on Natural Resources, which included language related to carbon sequestration in estuaries.

IV.E. Media Contributions

IV.E.1. Internet

IV.E.2. TV

IV.E.3. Radio

IV.E.4. Digital Media

IV.E.5. Print Media

IV.E.6. Blogs

IV.E.7. Feeds

IV.E.8. Other

IV.F Community & Other Service

Hyattsville Elementary School

Presentation to 2nd grade class on soil science, 2012

Presentation to K, 2nd, 3rd, and 6th grade classes on soil science, 2013

Presentation to 4th grade class on Chesapeake Bay and tidal marshes, 2014

STEM Fair Judge, 2014

Presentation to 2nd grade class on soil science, 2018

Hyattsville Middle School

STEM Fair Judge, 2012

V. Awards, Honors and Recognition

V.1. Research Fellowships, Prizes and Awards

- 1997 – University Graduate Fellowship, Graduate College at Penn State
- 1998 – Gamma Sigma Delta Honor Society of Agriculture, Penn State University
- 1999 – Fellowship, NASA Space Grant Consortium
- 2007 – Merit Award for Research, Gamma Sigma Delta Honor Society of Agriculture, University of Maryland-National Capital Area Chapter
- 2009 – Excellence in Research Award, Department of Environmental Science and Technology, University of Maryland
- 2011 – Journal of Soil and Water Conservation’s Best Research Paper Award for Impact and Quality for paper: Kleinman, P.J.A., A.L. Allen, **B.A. Needelman**, A.N. Sharpley, P. Vadas, L. Saporito, G. Folmar, and R.B. Bryant. 2007. Dynamics of phosphorus transfers from heavily manured Coastal Plain soils to drainage ditches. *Journal of Soil and Water Conservation* 62:225–235.
- 2013 – Honoree, 6th Annual University-Wide Celebration of Scholarship & Research

V.2 Teaching Awards

- 2000 – Coach, Collegiate Soil Judging National Championship (Penn State)
- 2002 – Coach, Collegiate Soil Judging Northeast Regional Championship
- 2006 – Coach, Collegiate Soil Judging Northeast Regional Championship
- 2009 – Teaching Award, Northeast Branch of the American Society of Agronomy, Crop Science Society of America and the Soil Science Society of America
- 2013 – Coach, Collegiate Soil Judging National Championship
- 2019 – Coach, Collegiate Soil Judging Northeast Regional Championship
- 2021 – Teaching Award, Tenure-track Faculty, Department of Environmental Science and Technology

V.3 Service Awards and Honors

V.4 Recognition in Media

Bailey, A. 2004. Council approves site plan: Mixed-use development would be on 361 acres near Bowie. *Prince George’s Journal*. Jan. 28, Vol. 66. p. 1, 7.

- Marlboro Clay research highlighted in local newspaper.

Roylance, Frank. 2007. Scientists dig deep for global solution: Carbon capture could help to curb world warming. *Baltimore Sun*. Feb. 4.

- Carbon sequestration in tidal marshes highlighted.
- <http://www.baltimoresun.com/news/nationworld/bal-te.carbon04feb04,0,4526819.story>

Pelton, Tom. 2007. Can this muck save the planet? *Baltimore Sun*. Oct. 9, No. 282, p. 1A, 7A.

- Front-page coverage of carbon sequestration in tidal marshes research.
- Accompanied by online video.

Morrow, Patsy. 2007. Prof. turns to marsh to help curb warming. Diamondback. Oct. 26, No 42, p. 3.

Ellis, Matt. 2010. Could Fire Help Chesapeake Bay's Tidal Marshes? Nov. 30, Maryland Sea Grant Website, News and Notes (http://www.mdsg.umd.edu/news/fire_tidal_marsh/)

Coverage of 2013 National Collegiate Soil Judging Championship

- Washington D.C. NPR affiliate station WAMU radio piece on the show Metro Connection entitled "Inside the World of... Competitive Soil Judging"
 - http://wamu.org/programs/metro_connection/13/06/07/inside_the_world_of_competitive_soil_judging
- WJLA (ABC7) piece entitled "Soil judging at the University of Maryland", 7/5/13
 - Broadcast during 5:00 News
 - <http://www.wjla.com/articles/2013/07/soil-judging-at-the-university-of-maryland-91014.html>
- Sintetos, Theresa. Soil judging team claims national title. Diamondback, Issue 141, 5/7/13.
 - Front page
 - http://www.diamondbackonline.com/news/campus/article_b6ad2f28-b6d6-11e2-a4be-001a4bcf6878.html
- Tweet of congratulations from Governor Martin O'Malley, 4/30/13.
- Tweet of congratulations from President Wallace Loh, 5/1/13.
- Lancaster Farming, Southern Edition. Terps dig deep to win national championship. Sunday 5/11/13
 - Front page
- Delmarva Farmer. Terps dig deep to win national championship. Tuesday 5/8/13
- UMD Right Now. Terps dig deep to win national championship. 5/2/13.
 - www.umd.edu front page
 - <http://agmr.umd.edu/news/terps-dig-deep-win-national-championship>
- Brown, Lauren, "Soil-judging Students Get Down and Dirty to Defend National Title", TERP magazine, Winter 2014.

Pelton, Tom. 2014. Burning a Protected Marshland to Stimulate Plant Growth. The Environment in Focus. Jan 22.

- Broadcast on WYPR 88.1 FM in Baltimore and affiliate stations
- Broadcast through Environment in Focus podcast.
- <http://wypr.org/post/burning-protected-marshland-stimulate-plant-growth>

Strain, Daniel. 2015. Finding Common Ground on Deal Island: Scientists and Residents of a Small Community Try a New Way of Discussing Sea Level Rise. On The Bay, Maryland Sea Grant. July 31.

- <http://mdsg.umd.edu/onthebay-blog/finding-common-ground-deal-island>

UMD Right Now. 2015. UMD Faculty Helps Develop Method to Encourage Worldwide Wetlands Restoration. Nov. 24.

- <http://www.umdrightnow.umd.edu/news/umd-faculty-helps-develop-method-encourage-worldwide-wetlands-restoration>

Farrell, Liam. 2017. The Tides That Bind: Proud and independent, the people of the Deal Island peninsula are on the front lines of climate change; UMD wants to help make sure their centuries-old community doesn't wash away. *Terp Magazine*. Oct. 10.

- *Terp Magazine* cover story featuring Deal Island Peninsula Project
- <http://terp.umd.edu/the-tides-that-bind/#.WfDwHlu3xhE>

V.5 Other Special Recognition

2013–14 – Leadership Fellow, UMD ADVANCE Program for Inclusive Excellence

VI. Other Information