

**Nicholas T. Basta**  
**Professor of Soil and Environmental Science**

**PERSONAL PROFILE**

School of Environment and Natural Resources  
The Ohio State University  
410C Kottman Hall, 2021 Coffey Road, Columbus, OH 43210  
Phone (614) 208-7280  
[basta.4@osu.edu](mailto:basta.4@osu.edu)

**EDUCATION**

Ph.D. 1989 Iowa State University, Soil Chemistry; Minor in Analytical Chemistry  
M.S. 1984 Iowa State University, Soil Science  
B.S. 1981 The Pennsylvania State University, Chemistry

**PROFESSIONAL EXPERIENCE**

7/13-present Director / Co-Director, Environmental Science Graduate Program, The Ohio State University, Columbus, OH.  
7/03–present Professor of Soil and Environmental Science, School of Environment and Natural Resources, The Ohio State University, Columbus, OH.  
8/91-6/03 Professor of Soil Chemistry, Dept. of Plant and Soil Sciences, Oklahoma State University, Stillwater, OK  
6/90-7/91 Research Soil Scientist, USDA ARS, North Central Soil Conservation Research Laboratory, Morris, MN

**CURRICULUM VITAE SUMMARY, BY THE NUMBERS**

<b>Professional Awards</b>	International (1), National (4), University (4)
<b>Grants and Contracts</b>	Total (58) \$29.1M Extramural (46) \$28.5M Intramural (12) \$521K
<b>Publications</b>	<b>Total</b>
Refereed journal manuscripts	127
Books / Book chapters	16
Abstracts and proceedings	333
Final Technical Reports	28
Other	10
News Releases	18
<b>Total</b>	<b>532</b>
<b>Teaching and Advising</b>	
Environment and Natural Resources 5262: Environmental Soil Chemistry and Remediation	Taught 22 times from Au 2003 to Au 2024 last 3y 25 students; SEI 4.7
Environment and Natural Resources 5273: Environmental Fate and Impact of Pollutants in Soil and Water	Taught 21 times from Sp 2004 to Sp 2024 last 3y 48 students; SEI 4.7
Environment and Natural Resources 5279: Urban Soils and Ecosystem Services: Assessment and Restoration	Co-taught 11 times from Au 2013 to Au 2024 with Dr. Brian Slater. Last 3y 44 students; SEI 4.3
Environmental Science 7899: Seminar, 1 semester hr, Autumn and Spring semesters	Co-taught 10 times (Au and Sp semesters) from Au 2019 to Au 2024 with Kelly Malone and Dr. Mary Gardiner; last 3 y 48/y students; SEI 4.4
<b>Graduate Student Advising and Conferred Graduate Degrees</b>	
Doctor of Philosophy, Ph.D. conferred	12
Master of Science, M.S. conferred	27
Ph.D. and M.S. in progress	6
<b>Significant Professional Scientific Conference Contributions</b>	
Plenary and Keynote Presentations	19
Symposium Organized for International and National Scientific Meetings	26
<b>Professional Service</b>	
Editorial Boards	Active: 4; career total: 8
External Examiner	International: 11; National: 16
International Committees	Active: 3
National Committees	Active: 3
Visiting Scientists -International	3
University Service Committees	Active:2; Total: 7
College and Department /School Committees	Active: 1; Total:16
Consulting and Expert Witness Service	Career total: 6

## **PROFESSIONAL RECOGNITION and AWARDS**

### **Awards**

#### International

2018. North American Colleges and Teachers of Agriculture (NACTA) Educator Award.

#### National

2010. Excellence in Review Award. Environmental Science and Technology Journal, American Chemical Society.

2008. U.S. Environmental Protection Agency, "Friend of Office of Solid Waste Award." In recognition of the "pathbreaking research work on the National Foundry Sand Risk Assessment" which led to USEPA guidance for beneficial use of foundry sand in topsoil blends.

2004. Fellow, Soil Science Society of America.

2003. Fellow, American Society of Agronomy.

#### University

2006. College of Food, Agricultural, and Environmental Sciences, Pomerene Departmental Teaching Excellence Award, The Ohio State University.

1998. James A. Whatley Award for Meritorious Research in Agricultural Science, Oklahoma State Univ. Award for outstanding researcher in College of Agricultural Sciences

1996. Outstanding Teaching Award, Dept. of Agronomy, Oklahoma State Univ.

1989. Research Excellence Award, Iowa State Univ. dissertation research designated as among top 10% at Iowa State)

### **Recognition**

2023. The National Academies of Sciences, Engineering and Medicine U.S. National Committee for Soil Science, Sept 2023-Oct 2026. Reappointed for 2<sup>nd</sup> term

2020. The National Academies of Sciences, Engineering and Medicine U.S. National Committee for Soil Science, May 2020-Aug 2023.

2022. Soil & Environmental Health Editorial Board.

2020. The National Academies of Sciences, Engineering and Medicine U.S. National Committee for Soil Science, 2020-2023.

2015. Professor Courtesy Appointment, Division of Environmental Health Sciences, College of Public Health, The Ohio State University. March 1, 2015.

2017. Interstate Technology Regulatory Council 2016 Team of the Year. Bioavailability in Contaminated Soil Member.

2008. Chair, Soil Chemistry (Division S-2), Soil Science Society of America, 2008-2011

2007. Technical Editor, Journal of Environmental Quality, 2002-2007

2002. Associate Editor, Journal of Environmental Quality, 1997-2002

2001. Board Representative, Environmental Soil Science (Division S-11), Soil Science Society of America, 2001-2004

## **SOCIETY MEMBERSHIP**

American Association for the Advancement of Science (AAAS) (member 2004-present, 20 yr)  
American Chemical Society (ACS) (member 1989-present, 35 yr)  
American Society of Agronomy (ASA) (member 1981-present, 43yr)  
Geological Society of America (GSA) (member 2021-present, 3 yr)  
International Conference of Biogeochemistry of Trace Elements (ICOBTE) (1999-present, 25 yr)  
International Conference on Heavy Metals in the Environment (ICHMET) (2016-present, 8 yr)  
International Union of Soil Sciences (IUSS), (member 1982-present, 22yr)  
Ohio Academy of Science  
Society for Environmental Toxicology and Chemistry (SETAC) (member 1996-present, 28 yr)  
Soil Science Society of America (SSSA) (member 1982-present, 42 yr)

## **PROFESSIONAL SERVICE**

### **Editorial Boards**

#### Active

Soil & Environmental Health, 2022-present  
Guest Editorial Board, J. Environmental Quality, 2022-present  
Frontiers in Soil Science-Soils and Human Health, 2021-present  
Editorial Board, Soil Systems, 2018-present.

#### Past

Guest Editorial, Environ. Pollution. Special Issue on Bioavailability, 2019-2020.  
Editorial Board, *J. Soil and Sediment Contamination*; 2003-2015  
Editorial Board, J. Environmental Quality,  
    Technical Editor, 2002-2007; Associate Editor, 1997-2002  
Editorial Board, Critical Reviews in Environmental Science and Technology, 2004-2006.

### **International Committees**

Global Contaminated Soil Advisory Group, Society for Environmental Toxicology and Chemistry,  
    1997-present  
International Conference for Heavy Metals in the Environment (2016-present)  
International Committee, International Conference on Biogeochemistry of Trace Elements  
    (2001-present)

### **National Committees**

#### Active

The National Academies of Sciences, Engineering and Medicine U.S. National Committee for  
    Soil Science, May 2020-2023. Reappointed for 2<sup>nd</sup> term Sept 2023-Oct 2026.  
The National Academies of Sciences, Engineering and Medicine. 2023-2024. Exploring  
    Linkages between Soil Health and Human Health.  
USDA National Institute of Food and Agriculture (NIFA) MultiState Project W-5170 (OHO01361-  
    MRF), Beneficial Use of Residuals to Improve Soil Health and Protect Public, and  
    Ecosystem Health.", 1992-present, 32 yr.

## **International and National Scientific Conference Contributions**

### **Plenary and Keynote Presentations, 2019-2024**

- Basta, N.T. 2024. Beneficial Use of Water Treatment Residuals. Beneficial Use of DWTR Workshop. Ohio EPA Office of Environmental Innovation, Delaware, OH. Dec. 12.
- Basta, N. T., & Lake, L. 2023. Bioavailability-Based Approaches for Controlling the Transfer of Lead in Soils. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. Oct. 29-Nov Keynote (invited)  
<https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/149556>Nicholas T. Basta.
- Basta, N.T. 2022. Biosolids: A Solution for Soil Health and Sustainability. Residuals and Biosolids 2022 Annual Meeting, Water Environment Association, Columbus, OH, May 25-27, 2022.
- Environmental Science Graduate Program. International Seminar: Developing Agriculture and Environmental Sciences, OSU-UC Partnership, Pontificia Universidad, Santiago, Chile, July 30, 2019.
- Key considerations to develop a framework to select bioaccessibility in contaminated soils. Modification of an existing in vitro method to predict relative bioavailable arsenic in soils. School of the Environmental, Nanjing University, Nanjing, China May 5, 2019.
- Bioavailability-Based soil remediation by soil amendment. 2019. Shandong University. People's Republic of China. May 11, 2019.
- Bioavailability-Based soil remediation by soil amendment. 2019. Jinan University, People's Republic of China. May 10, 2019.

### **PUBLISHED ABSTRACTS AND PROCEEDINGS, 2022-2024**

- Basta, N.T. 2024. Using residuals to improve urban soil health. Midwest Biosolids Association Annual Meeting, Purdue University, West Lafayette, IN. March 26. (invited)
- Basta, N.T. 2024. Living (Safely) with Forever Soil Contaminants Application of Soil Science to Protect Human Health. The National Academies of Sciences, Engineering and Medicine U.S. National Committee for Soil Science, Wash DC, April 25. (invited)
- Basta, N.T. K. Scow. 2024. Exploring Linkages between Soil Health and Human Health. Northwest Biosolids Association, webinar. June 13. (invited)
- Basta, N.T. 2024. Toxic Algal Blooms and Beneficial Reuse of Drinking Water Treatment Residuals as a Liming Soil Amendment. USDA NIFA Multistate Research Project W-4170, Seattle, WA. June 24-26.
- Basta, N.T., S.D. Whitacre, L.M. Lake, A.L. Foster, C. Alpers, P. Myers and V.L. Hanley. 2024. Performance of the California Bioaccessibility Method for Predicting Arsenic Relative Bioavailability in Contaminated Soils. Advances in Environmental Geochemistry. Geological Society of America Annual meeting, Anaheim, CA., 22–25 September (invited)
- McVey, Connor, Alpers, Charles N., Benzel, William M., Foster, Andrea L., Marvin-Dipasquale, Mark., Kieu, Le., Basta, Nick and Whitacre, Shane D. Geochemistry, mineralogy, and bioaccessibility of arsenic and mercury in mine waste from sulphur bank mercury mine, lake county, California. Advances in Environmental Geochemistry Geological Society of America Annual meeting, Anaheim, CA., 22–25 September

- Basta, N.T. 2024. Innovative Soil Blend for Remediation of Lead Contaminated Urban Soils and Protection of Public Health. Mid-Atlantic Biosolids Association webinar. Nov. 7.
- Basta, N.T., S.D. Whitacre, L.M. Lake, A.L. Foster, C. Alpers, P. Myers and V.L. Hanley. 2024. Performance of the California Bioaccessibility Method for Predicting Arsenic Relative Bioavailability in Contaminated Soils. Advances in Environmental Geochemistry. Geological Society of America Annual meeting, Anaheim, CA., 22–25 September (invited)
- Basta, N.T. 2024. Beneficial Use of Water Treatment Residuals. Beneficial Use of DWTR Workshop. Ohio EPA Office of Environmental Innovation, Delaware, OH. Dec. 12.
- Basta, N.T. 2024. Toxic Algal Blooms and Beneficial Reuse of Drinking Water Treatment Residuals as a Liming Soil Amendment. Sea Grant Freshwater Science Webinar. Dec 17 online 350 attendees
- Basta, N. T. 2024. W5170 Research Updates and Next Steps. Ohio Water Environment Association. Residuals and Biosolids Workshop. Dublin, OH December 3 2024
- Basta, NT. 2023. Innovative Soil Blend for Remediation of Lead Contaminated Urban Soils and Protection of Public Health. Mid-Atlantic Biosolids Assoc. Nov. 7.
- Dacres, A. P., Basta, N. T., & Ippolito, J. A. (2023) Bioavailability-Based Remediation of Lead (Pb)-Contaminated Sites through the Application of Biochar Amendments [Abstract]. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. Oct. 29-Nov 1. (invited) <https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/153731>Dacres, Adriana, NT
- Basta, N. T., & Lake, L. (2023) Bioavailability-Based Approaches for Controlling the Transfer of Lead in Soils [Abstract]. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. Oct. 29-Nov 1 KEYNOTE (invited) <https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/149556>Nicholas T. Basta.
- Lake, L., Basta, N. T., & Hettiarachchi, G. M. (2023) Use of Potassium Permanganate to Remediate Co-Contaminated Urban Soils [Abstract]. ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. <https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/153472>. Oct. 29-Nov 1. (invited)
- Basta, N. T., Slater, B., & Borders, M. (2023) Restoration Education for All: A Case Study of Open-Source Software Products in Urban Soils and Ecosystem Services Education ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. Invited Oct. 29-Nov 1. <https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/154344>
- Loryssa Lake and Nicholas Basta. 2023. **Innovative soil blend for remediation of lead contaminated urban soils and protection of public health.** First Joint International Conference of Biogeochemistry of Trace Elements (ICOBTE) & International Conference of Heavy Metals (ICHMET), Wuppertal, Germany, Sept. 6-10.
- Basta, Nicholas, and Loryssa Lake. 2023. Reactive Topsoil to Reduce Exposure to Heavy Metal Contaminated Soil and Protect Public Human Health. First Joint International Conference of Biogeochemistry of Trace Elements (ICOBTE) & International Conference of Heavy Metals (ICHMET), Wuppertal, Germany, Sept. 6-10.
- Basta, NT. 2023. A Risk Management Approach using Biosolids and other residuals to Reduce Exposure to Contaminated Soil and Protect Public Health. USDA NIFA W4170 Multistate annual meeting, Chicago, IL. June 26-28.

Basta, NT. 2023. Using Dredge to Clean up Lead and Other Dirty Soil Issues for Community Health on a Budget. 2023. Dredge Research and Innovation in Farming Team (DRIFT). Ohio EPA. May 3.

Basta, NT. 2023. Long Term Soil Quality and Health Benefits from a One Time Land Application of Biosolids. Michigan Water Environment Biosolids Conference, Battle Creek, MI. Mar 29-30.

Nicholas T. Basta and Loryssa M. Lake. 2022. A Risk Management Approach to Reduce Exposure to Contaminated Soil and Protect Public and Community Health. Soil Science Society of America International Annual Meeting, Baltimore, MD. Nov. 6-9, 2022.

Samantha Hall, Jocelyn Fimbres, Kaylee Abato, Julia Termine, Maria Pilar Botana Martinez, Diana Ceballos, Shane Whitacre, Nicholas Basta, and Wendy Heiger-Bernays. Community Garden Soil Sampling for Metals to Inform a Community Renovation and Expansion Project. International Society for Exposure Science, Lisbon, Portugal, Sept. 25-29, 2022

Basta, N.T. 2022. Biosolids: A Solution for Soil Health and Sustainability. Residuals and Biosolids 2022 Annual Meeting, Water Environment Association, Columbus, OH, May 25-27, 2022.

### **Symposia Organized for International and National Scientific Meeting, 2019-2024**

Translation of Soil Chemistry Science to Reduce Contaminant Exposure and Protect Human Health. Soil Science Society of America International Annual Meeting, Phoenix, AZ. Nov. 2020. Organizers: Ganga M. Hettiarachchi (Kansas State Univ.) and Nick Basta (Ohio State University).

Trace element bioavailability in aquatic and terrestrial environments and implications to human and ecological risk assessment. International Conference on the Biogeochemistry of Trace Elements, Nanjing, China May 5-9, 2019. Organizers: Nick Basta (Ohio State University, USA), Claude Fortin (INRS – Eau Terre Environment, Canada), Ying Ge (Nanjing Agricultural University, China), Albert Juhasz (University of South Australia) and Lena Ma (SW Forestry University, China)

## **RESEARCH**

### **Focus**

My research program focuses on soil and environmental chemistry / science and its application for soil and environmental remediation:

- ✚ Environmental chemistry of organic and inorganic pollutants in contaminated soils with emphasis on human (e.g., public health), agronomic (e.g., crop, animal), and ecological bioavailability, contaminant fate and transport, and human health and ecological risk assessment
- ✚ Development and evaluation of new technologies used for in situ remediation of contaminated soils (e.g., soil amendments).
- ✚ Development of innovative *in vitro* laboratory methods to predict (1) contaminant and nutrient bioavailability and (2) the ability of remediation methods to reduce contaminant bioavailability and human and ecological exposure.
- ✚ Beneficial use of agricultural, industrial, and municipal by-products through land application; soil and environmental chemistries of by-products in agronomic/environmental systems with emphasis on their risk and environmental impact

- ✚ Fundamental biogeochemical processes that affect heavy metal and trace element bioavailability, human and ecological health in soil-water systems

### Grants and Contracts

Source	Number	Project Total (\$)
Extramural Sources	46	28,565,108
Intramural Sources, Oklahoma State Univ.	8	201,265
Intramural Sources, Ohio State Univ.	4	521,226
All	58	29,086,334

### Active Projects

Source: US Geological Survey

Title: Evaluation of in vitro bioaccessibility for assessing the biogeochemistry of lead and other elements in soil

Investigator(s): Basta PI

Project Total: \$ 32,254

Grant Duration: 9/24 to 9/26

Source: USDA ARS

Title: The soil health nexus: Biochar use for improving soil health and limiting PFAS movement in soil

Investigator(s): Ippolito PI, Basta Co-PI

Project Total: \$ 618,497

Grant Duration: 9/23 to 9/27

Source: Rambol Environ, Inc

Title: Soil Amendment Technology Evaluation Study (SATES), discrete sampling

Investigator(s): N. T. Basta (PI)

Project Total: \$ 39,312

Grant Duration: 7/1/23 12/31/25

Source: Colorado State Univ

Prime Sponsor: Natural Resources Conservation Service

Title: Review and assess the state of PFAS science in agriculture to improve knowledge and understanding of agricultural PFAS issues and conduct a suite of PFAS research projects to inform NRCS activities

Investigator(s): N. Basta

Project Total: \$ 179,733

Grant Duration: 9/22 to 9/25

Source: Ohio Department of Higher Education

Title: Do Conservation Channel Designs deliver an effective Last-Ditch Defense against Downstream Phosphorus Impairment.

Investigator(s): J. Witter PI, R. Winston, N. Basta, A. Shah, V. Shedekar, J. D'Ambrosio, D. Mecklenburg

Project Total: \$331,432

Grant Duration: 8/22 to 12/24



Source: Ohio Department of Higher Education  
 Title: Beneficial Use of Byproducts to Reduce P Loss from Agricultural Land  
 Investigator(s): N. Basta PI, J. Witter, C. Penn, M. Brooker, A. Shah, J. Ziss  
 Project Total: \$238,243  
 Grant Duration: 8/22 to 12/24

Source: City of Columbus  
 Title: Long Term Effect of Land Application of City of Columbus Biosolids on Soil Health and Crop Quality  
 Investigator(s): N. T. Basta (PI)  
 Project Total: \$141,670  
 Grant Duration: 10/1/19 to present

**Current USDA-NIFA Projects**

The Ohio State University  
 Project MRF project W-5170, Beneficial Use of Residuals to Improve Soil Health and Protect Public and Ecosystem Health.  
 Start Date: 10/01/2024 - 09/30/2029

**PUBLICATIONS**

<b>Publication</b>	<b>Total</b>	<b>Last 5 y</b>
Refereed journal manuscripts	127	12
Books / Book chapters	16	3
Abstracts and proceedings	333	30
Final Technical Reports	28	7
Other		
Non refereed journal manuscripts	2	0
Research bulletins	4	0
Extension Publications	4	0
New Releases	18	6
<b>Total</b>	<b>532</b>	<b>58</b>

**Publication Scholar Metrics for Refereed Science Journal Manuscripts**

Citations	12,129
h-index	55
i10-index	117
Publications with >100 citations	33
Five highest cited	989, 662, 637, 608, 526

**Refereed Journal Publications (2019-2024)**

Loryssa M. Lake, Sarah B. Scott, Darryl B. Hood, Meagan Kellis, Mary M. Gardiner, and Nicholas T. Basta. 2024. Risk management approach using ash-based amendment blends for remediation of lead-contaminated urban soils and protection of public health. *Soil & Environmental Health* 2:100102. <https://doi.org/10.1016/j.seh.2024.100102>

- Lake Loryssa M. and Nicholas T. Basta. 2024. Ineffectiveness of Phosphorus-Containing Amendments to Reduce Pb Bioaccessibility in an Urban Alkaline Soil. *J. Environ. Qual.* 53 (5): 743-757. <https://doi.org/10.1002/jeq2.20598>
- Norton, A., Russell, Á., Radford, A. et al. Short Report: Addressing Community Air Traffic Concerns: A Pilot Study on Metals and Other Elements in Soil. 2024. *Water Air Soil Pollut* 235: 22. <https://doi.org/10.1007/s11270-023-06790-y>
- Loryssa M. Lake, Kaitlyn S. Benson, and Nicholas T. Basta. 2023. Evaluation of Dredge Fines Material in Manufactured Soil Blends on Soil Health Parameters. *Agrosyst Geosci Environ.* 2024;7:e20470. <https://doi.org/10.1002/agg2.20470>.
- Tania D. Burgos Hernández, Brian K. Slater and Nicholas Basta. 2023. Comparison of methods for determining organic carbon content of urban soils in central Ohio. *Geoderma Regional* 34:e00680.
- Hettiarachchi, Ganga M, Linda S Lee, Hui Li, Dominic Brose, and Nicholas Basta. 2023. Translating Soil Science to Improve Human Health. *Front. Environ. Sci.* 11:1215416. doi: 10.3389/fenvs.2023.1215416.
- Manfred M. Mayer, Nicholas T. Basta, Kirk G. Scheckel. 2022. Using phosphate amendments to reduce bioaccessible Pb in contaminated soils: a meta-analysis. *Frontiers in Soil Science, Special Issue: Translating Soil Science to Improve Human Health section Soils and Human Health.* p. 1-14. DOI 10.3389/fsoil.2022.1028328
- Amanda Norton, Áine Russell, Arden Radford, Mayah Burgess, Julia A. Bauer, Cindy L. Christiansen, Suzanne Knight, Shane Whitacre, Nicholas Basta, and Diana Ceballos. 2022. Addressing Community Air Traffic Concerns: A Pilot Study on Metals and other Elements in Milton Soil. *International J. of Hygiene and Environ. Health.* In press
- Lake, L.M., N. T. Basta and D.J. Barker. 2021. Modifying Effects of Soil Properties on Bioaccessibility of As and Pb from Human Ingestion of Contaminated Soil. Special Issue "Medical Geology in the Urban Environment." *Geosciences: 11, 126,* <https://doi.org/10.3390/geosciences11030126>
- Azeem, M., A. Ali, P.G.S.A. Jeyasunder, Y. Li, H. Abelrahman, A. Latif, R. Li, N. Basta, G. Li, S.M. Shaheen, J. Rinkleve, and Z. Zhang. 2021. Bone-derived biochar improved soil quality and reduced Cd and Zn phytoavailability in a multi-metal contaminated mining soil. *Environ. Pollut.* 277:116800.
- Zhang, Xiaoqin, Elizabeth A. Dayton, Nicholas T. Basta. 2020. Predicting the modifying effect of soils on arsenic phytotoxicity and phytoaccumulation using soil properties or soil extraction methods. *Environ. Pollut.* 263:1-10.
- Brown, Sally, James A. Ippolito, Lakhwinder Hundal, and Nicholas T. Basta. 2020. Municipal biosolids – A resource for sustainable communities. *Current Opinion in Environmental Science & Health.* 14:56-62.
- Li, Hong-Bo, Di Zhao, Meng-Ya Li, Jie Li, Shi-Wei Li, Albert L. Juhasz, Nicholas T. Basta, and Lena Q. Ma. 2019. Oral bioavailability of As, Pb, and Cd in contaminated soil, dust, and food: method development using animal bioassays. *ES&T.* 53(18):0545-10559.
- Wade, J., S. W. Culman, S. Sharma, M. Mann, M. S. Demyan, K. L. Mercer, and N. T. Basta. 2019. How Does Phosphorus Restriction Impact Soil Health Parameters in Midwestern Corn–Soybean Systems?. *Agron. J.* 0. doi:10.2134/agronj2018.11.0739

**Books / Book Chapters (2019-present)**

- National Academies of Sciences, Engineering, and Medicine. 2024. Exploring Linkages Between Soil Health and Human Health. Washington, DC: The National Academies Press. <https://doi.org/10.17226/27459>.
- Hettiarachchi, G.M., A. Betts, C. Wekumbura, L. Lake, M. Meyer, K.G. Scheckel, and N.T. Basta. 2023. Lead: the most extensively spread toxic environmental contaminant. Global Compendium of Contaminated Sites. In (Ravi Ndiou, ed.) Inorganic Contaminants and Radionuclides, 1<sup>st</sup> ed., Elsevier.
- Basta, N.T., Alyssa M. Zearley, Jeffery A. Hattey, and Douglas L. Karlen. 2021. A Risk-Based Soil Health Approach to Management of Soil Lead. In: D.L. Karlen, D.E. Stott, and M.M. Mikha (eds). Soil Health: Vol. 1: Approaches to Soil Health Analysis, Chapter 7, Soil Science Society of America (SSSA) & Wiley International, SSSA, Madison, WI.
- Obrycki J.F., K.K. Minca, and N.T. Basta. 2016. Screening for Soil Lead Contamination Using a Common Soil Test Method. In Sowing Seeds in the City: Municipal and Ecological Considerations (S. Brown, K. Mclvor and E. Snyder (eds.)), Springer, NY.
- Basta, N.T. and A. Juhasz. 2014. Chapter 9: Using In Vivo Bioavailability and/or In Vitro Gastrointestinal Bioaccessibility Testing to Adjust Human Exposure from Soil Ingestion. In : R.J.Bowell, J. Majzlan and C.Alpers (eds.) Geochemistry, Mineralogy and Microbiology of Arsenic in Environment, Reviews in Mineralogy and Geochemistry, Mineralogical Society of America.
- Whitacre, S.D., N.T. Basta, C.J. Everett, K. Minca, and W.L. Daniels. 2013. Identification of toxic agents and potential exposure routes to Appalachian coal mining communities. In: J.R. Craynon (ed.) Environmental considerations in energy production. Soc. Mining Met. & Explor., Englewood, CO.

**Research Project Final Technical Reports (2020-2024)**

- Basta, N.T. 2024. Data Summary Report for the Soil Amendment Technology Evaluation Study Soil Amendment Technology Evaluation Study. "Final Draft"
- Basta, N.T and S.W. Whitacre. 2023. Long Term Effect of Land Application of the City of Columbus Biosolids on Soil Health. Annual Report. City of Columbus, OH.
- Basta, N.T. 2023. Effect of Soil Properties on Leaching Potential and Crop Uptake of Microcystin in Land Applied Drinking Water Treatment Residuals. Final Report. Ohio Department of Higher Education
- Basta, N.T and S.W. Whitacre. 2022. Long Term Effect of Land Application of the City of Columbus Biosolids on Soil Health. Annual Report. City of Columbus, OH.
- Basta, N.T 2021. Environmental Fate and Persistence of Microcystin in Land Applied Drinking Water Treatment Residuals. Final Report. Ohio Department of Higher Education
- Basta, N.T., S. Whitacre, M. Vazquez Miranda, and D. Barker. 2021. Soil Amendment Technology Evaluation Study Phase II: Bench-Scale Statistical Analysis Technical Memo. Rambol Environmental, Seattle, WA.
- Basta, N.T., I. Pepper, L.S. Lee, G. Kester, and A. Zearley. 2020. W4170 Multistate Research Committee Response to USEPA OIG Report No. 19-P-00021 "EPA unable to assess the

impact of unregulated pollutants in land-applied biosolids on human health and the environment”,

<https://www.nimss.org/system/ProjectAttachment/files/000/000/502/original/W4170%20Response%20to%20OIG%20Report%20July%2023%202020%20final.pdf> USDA National Institute of Food and Agriculture, Research Committee W4170, June 2020.

## **TEACHING AND ADVISING**

### **Environment and Natural Resources 5262: Environmental Soil Chemistry and Remediation**

ENR 5262 (3 semester hr) has two 1-hr lectures and a 2-hr computer laboratory.

A comprehensive study of soil biogeochemical processes relevant to soil and chemical contaminant remediation. Emphasis is placed on soil and environmental chemical processes on human and ecological health, ecosystem function, and soil remediation. Water and soil solution chemistry; soil carbon/organic matter, soil minerals, precipitation/dissolution, adsorption reactions and models, redox chemistry, soil acidity. Restoration / remediation topics include human and ecological contaminant exposure in soil-water systems; environmental fate of fertilizer, pesticides in agricultural soil; remediation of severely degraded coal mineland soils and water (acidity, other); remediation of salt degraded soil (i.e. surface impact from subsurface shale fracturing); remediation of contaminated (heavy metals, toxic organics) soil; restoration of urban soils. Socioeconomic considerations for environmental remediation methods, including cost and community / regulatory agency acceptance, will be studied. Laboratory component focuses on soil investigation and remediation of contaminated sites including experience using environmental soil chemistry computer models.

### **Environment and Natural Resources 5273:**

#### **Environmental Fate and Impact of Pollutants in Soil and Water**

ENR 5273 (3 semester hr) has two 1 hr 20 m lecture classes. (offered every Spring Semester). An overview of pollutant sources, pollutant transport through soil and water, and environmental fate of pollutants. Soil and environmental chemistry of organic and inorganic contaminants. Pollutant transport through human and ecosystem exposure pathways.

### **Environmental Science 7899: Issues in Environmental Science Seminar, 1 semester hr, Autumn and Spring semesters**

#### **ENVIRONMENT AND NATURAL RESOURCES 5279:**

#### **Urban Soils and Ecosystem Services: Assessment and Restoration**

Co-taught with Dr. Brian Slater.

3 semester hrs (one 2-hr class; one 3-hr lab). A comprehensive study focused on assessment and restoration of urban soil to provide essential ecosystem services. Urban soil laboratory provides hands-on experience with soil assessment and restoration

#### **Course Description:**

A comprehensive study focused on assessment and restoration of urban soil to provide essential ecosystem services. Urban soil laboratory provides hands-on experience with soil assessment and restoration.

## Advising

**Graduate Student Advising and Committees**  
**Graduate Student Degree Programs Chaired**  
**Completed and in progress; 45 Total**  
**15 Ph.D., 30 M.S.**

<b>The Ohio State University</b>			
<b>25 total: 18 M.S., 7 Ph.D. / In progress 6</b>			
	<b>Name</b>	<b>Degree</b>	<b>COMPLETION DATE</b>
1	Monica Mathews-Williamson	M.S. Soil Science	Sept. 2004
2	Doug Beak	Ph.D. Soil Science (Soil Chemistry)	Dec. 2005
3	Chris Hurdzan	Co-advisor, M.S. Soil Science	June 2006
4	Jill Foster	M.S. Environmental Science	June 2006
5	Richard H. Anderson	Ph.D. Soil Science (Soil Chemistry) Minor in Statistics; Autumn 2005-Summer 2008	August 2008
6	Shane Whitacre	M.S. Soil Science; Spring 2006-Spring 2009	June 2009
7	Jason Undercoffer	M.S. Soil Science; Autumn 2006-Spring 2009	June 2009
8	Kristen Minca	M.S. ENR / Soil Science ; Jan. 2010 – May 2012	May 2012
9	Dawn Busalacchi	M.S. Environmental Science	June 2012
10	Jamie Richey	M.S. Environmental Science; Summer 2006-May 2013 (part time student)	May 2013
11	Zhengfi Liang	M.S. Environmental Science	Summer 2015
12	John Obrycki	Ph.D. ENR / Soil Science	August 2016
13	Brooke Stevens	Ph.D. Environmental Science	August 2016
14	Katilyn Benson	M.S. ENR / Soil Science	May 2017
15	Alyssa Zearley	M.S. ENR / Soil Science	August 2018
16	Loryssa Lake	M.S. ESGP	Spring 2021
17	Adriana Dacres	M.S. ENR / Soil Science	Spring 2021
18	Martina Vásquez Miranda	M.S. ESGP	Spring 2021

19	Manfred Mayer	M.S. ENR / Soil Science	Spring 2022
20	Loryssa Lake	Ph.D. ESGP	Spring 2024
21	Zhian Lin	M.S. ENR / Soil Science	Spring 2024
22	Adriana Dacres	Ph.D. ENR / Soil Science	Expected Spring 2025
23	Heather Curtis	M.S. ENR / Soil Science	Expected Autumn 2025
24	Ying-Ren Lai	Ph.D. ENR / Soil Science	Expected Spring 2026
25	Megan Kellis	M.S. ESGP	Expected Spring 2026
26	Mason Reid	Ph.D. ESGP	Expected Spring 2027
	<b>Oklahoma State University; 20 total, 12 M.S.; 8 Ph.D.</b>		
	<b>Name</b>		
1	Tracy Johnston	M.S. Soil Chemistry	
2	John Sloan	Ph.D. Soil Chemistry	
3	Jeri Anderson	M.S. Soil Chemistry	
4	Jason Peters	M.S. Environmental Science (Chemistry)	
5	Eric Hanke	M.S. Soil Chemistry	
6	Randy Gradwohl	M.S. Environmental Science (Chemistry)	
7	Robin Rodriguez	Ph.D. Soil Chemistry Minor: Environmental Engineering	
8	Jack Schroder	M.S. Environmental Science (Chemistry)	
9	Robert Zupancic	M.S. Soil Chemistry	
10	Elizabeth Dayton	M.S. Soil Chemistry	
11	Lori Gallimore	M.S. Soil Chemistry	
12	Steve McGowen	Ph.D. Soil Chemistry	
13	Kerry Snethen	M.S. Environmental Science (Chemistry) Specialization: Environmental Toxicology and Risk Assessment	
14	Karen Bradham	Ph.D. Environmental Science (Zoology) Specialization: Environmental Toxicology and Risk Assessment (committee co-chair)	
15	Felicia Armstrong	Ph.D. Soil Chemistry	
16	Jack Schroder	Ph.D. Environmental Science (Chemistry) Specialization: Environmental Toxicology and Risk Assessment	
17	Elizabeth Dayton	Ph.D. Soil Chemistry	
18	Michael Friend	M.S. Environmental Science (Chemistry)	
19	Jitao Si	Ph.D. Soil Chemistry Minor: Environmental Engineering	
20	Mark Casillas	M.Agr.	

### Graduate M.S. Theses and Ph.D. Dissertations

Scott, T.D. 1994. M.S. Thesis. Distribution, speciation, and bioavailability of heavy metals in soils of Oklahoma.

Sloan, J.J. 1994. Ph.D. Dissertation. Use of phosphorus fertilizer or lime-stabilized sewage sludge to remediate acid soils and alleviate aluminum toxicity.

- Anderson, J.A. 1996. M.S. Thesis. Remediation of heavy metal contaminated soil by *in situ* immobilization.
- Peters, J.M. 1996. M.S. Thesis. Use of municipal and industrial waste amendments to reduce bioavailable phosphorus from agricultural land treated with animal manures.
- Hanke, E.M. 1997. M.S. Thesis. Remediation of arsenic-contaminated soil and trace element availability to winter wheat in biosolids amended soils.
- Rodriguez, R.R. 1998. Ph.D. Dissertation. Bioavailability and biomethylation of arsenic in contaminated soil and solid wastes.
- Gradwohl, R. 1998. M.S. Thesis. Heavy metal bioavailability of contaminated soils, remediation methods and long-term stability.
- Schroder, J.L. 1998. M.S. Thesis. Bioavailability and transmission pathways of contaminants to *Sigmadon Hispidus* on petrochemical sites.
- Zupancic, R.J. 1999. M.S. Thesis. Beneficial utilization of drinking water treatment residuals as a soil substitute in land reclamation.
- Gallimore, L.E. 1999. M.S. Thesis. Use of water treatment residuals to reduce nutrient runoff and as an alternate growth media.
- Dayton, E.A.. 1999. M.S. Thesis. Beneficial use of drinking water treatment residuals.
- McGowen, S.L. 2000. Ph.D. Dissertation. Chemical treatments for reducing heavy metal solubility and transport in smelter-contaminated soils.
- Snethen, K.L. 2002. M.S. Thesis. Chemical immobilization of lead, zinc, and cadmium based on risk and contaminant extractability.
- Bradham, K.D. 2002. Ph.D. Dissertation. Effect of soil properties on the bioavailability and toxicity of metals to *Eisenia Andrei*. (Co-chaired committee with Dr. Roman Lanno, Dept. of Entomology, Ohio State University.)
- Dayton, E.A. 2003. Ph.D. Dissertation. Relative contribution of soil properties to modifying the phytotoxicity and bioaccumulation of cadmium, lead and zinc to lettuce.
- Schroder, J.L. 2003. Ph.D. Dissertation. Bioavailability and toxicity of heavy metals in contaminated soils to human and ecological receptors.
- Armstrong, F.P. 2003. Ph.D. Dissertation. Extractability and bioavailability of arsenic in soils and the effect of iron remediation efforts.
- Friend, M. S. 2003. M.S. Thesis. Chemical processes controlling soluble phosphorus in soil fertilized with poultry litter and using diammonium phosphate fertilizer to reduce risk from incidental ingestion of lead contaminated soil.
- Si, Jitao. 2004. Ph.D. Dissertation. Assessing the effect of soil properties on bioavailability and phytotoxicity of heavy metals.
- Mathews-Williamson, M. 2004. M.S. Thesis. Decrease in calcium chloride extractable and bioaccessible arsenic from CCA-contaminated soil by treatment with poorly crystalline iron or aluminum oxides.
- Beak, Douglas G. 2005. Ph.D. Dissertation. Lead and arsenic speciation and bioaccessibility following sorption on oxide mineral surfaces.
- Hurdzan, C.M. 2006. M.S. Thesis. Polycyclic aromatic hydrocarbon biodegradation and release from natural organic matter surrogates. (Co-chaired committee with Dr. Olli Tuovinen, Dept. of Microbiology, The Ohio State University.)
- Foster, Jill. 2006. M.S. Thesis. The effect of dosing vehicle and arsenic speciation on arsenic bioaccessibility in smelter contaminated soil.
- Anderson, R.H. 2008. Ph.D. Dissertation. Soil physical and chemical property effects on toxicity and bioaccumulation of As (V), Cd, Pb, and Zn by herbaceous plant receptors.
- Whitacre, S. D. 2009. M.S. Thesis. Soil controls on arsenic bioaccessibility: Arsenic fractions and soil properties.
- Undercoffer, J. S. 2009. M.S. Thesis. Monitoring phosphorus transport and soil test from two distinct drinking water treatment residual application methods.

- Minca, K.K. 2012. M.S. Thesis. Using Soil Nutrient Tests and 1M HNO<sub>3</sub> to Predict Total and Bioaccessible Pb in Urban Soils.
- Busalacchi, D. 2012. M.S. Thesis. Evaluation of Biosolids as a Soil Amendment for Use in Ecological Restoration
- Liang, Zhenfei. 2015. M.S. Non-Thesis Report. Predicting Metal(loid) Phytoaccumulation from Soil Property and Chemical Extraction Method.
- Stevens, Brooke Nan. 2016. Ph.D. Dissertation. Bioaccessibility, Bioavailability, and Chemical Speciation of Arsenic in Contaminated Soils and Solid Wastes. The Ohio State University, Columbus. OH.
- Obrycki, John Francis. 2016. Ph.D. Dissertation. Managing Soils for Environmental Science and Public Health Applications. The Ohio State University, Columbus. OH.
- Benson, Kaitlyn Suzanne. 2017. M.S. Thesis. Assessment of Soil Quality Parameters of Long-Term Biosolids Amended Urban Soils and Dredge Blends. The Ohio State University, Columbus. OH.
- Alyssa, M. Zearley. 2018. Incorporating Diet into In Vitro Bioaccessibility Assays to Improve Prediction of Bioavailability of Soil Pb in Birds and Humans. The Ohio State University, Columbus. OH.
- Martina Laura Vázquez Miranda. 2021. Bioaccessibility based in-situ remediation of lead-contaminated soils using local materials. The Ohio State University, Columbus. OH.
- Adriana P. Dacres. 2021. Ability of Soil Properties and Soil Extraction Methods to Predict Phytoavailability and Bioaccessibility of As, Cd, Pb
- Loryssa Michelle Lake. 2021. Modifying Effect of Soil Properties on Bioaccessibility of As and Pb from Human Ingestion of Contaminated Soil.
- Manfred M. Mayer. 2022. Factors Affecting the Bioaccessibility of Pb in Soils Amended with Phosphate: A Meta-analysis and Bench-scale Study
- Loryssa M. Lake. 2024. Novel In Situ Heavy Metal and Toxic Organic Soil Remediation to Reduce Human Health Exposure and Promote Soil Health.
- Zhian Lin, 2024. Effect of Soil Properties on Mobility and Crop Uptake of Microcystin in Land Applied Drinking Water Treatment Residuals