

NICHOLAS T. BASTA
PROFESSOR OF SOIL AND ENVIRONMENTAL CHEMISTRY
<https://senr.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 Co-Director, Environmental Science Graduate Program, The Ohio State University, Columbus, OH.
7/03–present Professor of Soil and Environmental Chemistry, 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

RECOGNITION AND AWARDS

Fellow, Soil Science Society of America
Fellow, American Society of Agronomy
Professor Courtesy Appointment, Division of Environmental Health Sciences, College of Public Health, The Ohio State University.
Chair, Soil Chemistry (Division S-2), Soil Science Society of America, 2008-2011
Technical Editor, *Journal of Environmental Quality*, 2002-2007 (reappointed for 2005-2007)
Board Representative, Environmental Soil Science (Division S-11), Soil Science Society of America, 2001-2004
Associate Editor, *Journal of Environmental Quality*, 1997-1999 (reappointed for 2000-2002)

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 (\$)	N. Basta (\$)*
Extramural Sources	38	26,067,099	4,320,584
Intramural Sources, Oklahoma State Univ.	8	201,265	136,419
Intramural Sources, Ohio State Univ.	7	593,339	198,845
All	53	26,861,703	4,655,848

Select grants relevant to DoD / SERDP research

Granting Source: Strategic Environmental Research and Development Program (SERDP)
Title: Mechanisms and Permanence of Sequestered Pb and As in Soils: Impact on Human Bioavailability

Investigator(s): N.T. Basta (PI), Dr. Kirk G. Scheckel, USEPA NRMRL; Dr. Philip M. Jardine, Dr. Chris W. Schadt, Oak Ridge National Laboratory; Dr. Karen Bradham, USEPA NERL; Dr. David J. Thomas, USEPA NHREEL; Dr. Mark L. Failla, OSU; Dr. Rufus L. Chaney, USDA ARS.

Project Total: \$1,684,135

Grant Duration: 05/10 to 11/15

Granting Source: Environmental Security Technology Certification Program (ESTCP)
Project Title: The Effect of Soil Properties on Decreasing Toxic Metal Bioavailability: Field Scale Validation to Support Regulatory Acceptance

Principal Investigator(s): A.L. Hawkins, R.L. Biggers (Naval Facilities Engineering Service Center), P.M. Jardine (Oak Ridge National Laboratory), N.T. Basta, E.A. Dayton, R. P. Lanno (Ohio State Univ.), S.E. Fendorf (Stanford University), D.I. Bannon (US Army), and N.J. Navarro (US Army Corps of Engineers).

Project Total: \$1,328,994

Grant Duration: 8/05 to 4/09

Granting Source: Strategic Environment Research and Development Program
Project Title: Determining the Bioavailability, Toxicity, and Bioaccumulation of Organic Chemicals and Metals for the Development of Ecological Soil Screening Levels

Principal Investigator(s): R.P. Lanno (Entomology, Ohio State Univ.) and N.T. Basta; R.T. Checkai (U.S. Army Edgewood Chemical Biological Center), and R. Kuperman (Geo-

Centers, Inc.
 Aberdeen Proving Ground, MD)
Project Total (N. Basta): \$1,203,612
Grant Duration: 3/01 to 2/04

Granting Source: U.S. Air Force (USAF-OSR/NL)
Project Title: In Situ Dose-Response Relationships for a Mammalian Multiparameter Model for Assessing Petrochemical-Induced Ecotoxicity
Principal Investigator(s): R. Lochmiller and Karen McBee (Zoology, Oklahoma State Univ.); Charles Quall, III (Vet. Pathology, Oklahoma State Univ.); and N.T. Basta
Project Total (N. Basta): \$649,330
Grant Duration: 4/95 to 3/98

PUBLICATIONS

Publication	Total	Last 5 Yr	In review
Refereed journal manuscripts	126	17	1
Books / Book chapters	13	2	1
Abstracts and proceedings	291	51	
Non refereed journal manuscripts	2	2	
Research Project Final Technical Reports	21	6	
Research bulletins	4	1	
Instructional	2	0	
Extension Publications	4	1	
New Releases	14	8	
Total	479	88	2

Publication Scholar Metrics for Refereed Science Journal Manuscripts

Citations	7940
h-index	43
i10-index	94
Publications with >100 citations	22
Publications with >50 citations	39
Five highest cited	599, 476, 437, 431, 401

SELECT JOURNALS 2013 TO PRESENT

Brooke N. Stevens, Aaron R. Betts, Bradley W. Miller, Kirk G. Scheckel, Richard H. Anderson, Karen D. Bradham, Stan W. Casteel, David J. Thomas, and Nicholas T. Basta. 2018. Arsenic Speciation of Contaminated Soils/Solid Wastes and Relative Oral Bioavailability in Swine and Mice. *Soil Syst.* 2:1-13.

Obrycki, John F., Darryl B. Hood, Tyler Serafini, Chris Alexander, Pam Blais, Nicholas T. Basta. Public health data contextualizes soil Pb hazard management in Ohio. 2018. *Journal of Public Health Manag Pract* 24(2): e18-e24.

- Whitacre, Shane D., Nicholas T. Basta, Brooke N. Stevens, Valerie Hanley, Richard H. Anderson, and Kirk G. Scheckel. 2017. Modification of an Existing In vitro Method to Predict Relative Bioavailable Arsenic in Soils. *Chemosphere* 180:545-552.
- Obrycki, John F., Nicholas T. Basta, Robyn S. Wilson. 2017. Evaluating public and regulatory acceptance for urban soil management approaches. *J. Environ. Qual.* 46: 20-26. doi:10.2134/jeq2016.06.0230.
- Obrycki, John F., Kirk G. Scheckel, and Nicholas T. Basta. 2017. Soil solution interactions may limit Pb remediation using P amendments in an urban soil. *Environ Pollut.* 220:549-556.
- Obrycki, John F., Nicholas T. Basta, Steven W. Culman. 2017. Management Options for Contaminated Urban Soils to Reduce Public Exposure and Maintain Soil Health. *J. Environ. Qual.* 46(2): 420-430.
- Beyer, Nelson, W., Nicholas T. Basta, Rufus Chaney, Paula F. P. Henry, Thomas May, David Mosby, Barnett A. Rattner, Kirk G. Scheckel, Daniel Sprague. Bioaccessibility tests accurately estimate bioavailability of lead to quail. *Environ. Toxicol. Chem.* 35: 2311–2319, 2016.
- Basta, N.T., D.M. Busalacchi, L.S. Hundal, K. Kumar, R.P. Dick, R.P. Lanno, J. Carlson, A.E. Cox, and T.C. Granato. 2016. Restoring ecosystem function in degraded urban soil using biosolids, biosolids blend and compost. Special Issue: Soil in the City. *J. Environ. Qual.* 45(1): 74-83.
- Obrycki, John F., Nicholas T. Basta, Kirk Scheckel, Albert Juhasz, Brooke N. Stevens, and Kristen K. Minca. 2016. Phosphorus amendment efficacy on soil Pb depends upon bioaccessible method conditions. Special Issue: Soil in the City *J. Environ. Qual.* 45(1): 37-44.
- Yuqin Jiao, Julie K. Bower, Wansoo Im, Nicholas Basta, John Obrycki, Mohammad Z. Al-Hamdan, Allison Wilder, Claire Bollinger, Tongwen Zhang, Ludie Hatten, Jerrie Hatten, Darryl B. Hood. 2015. Development of Educational PPGIS Risk-Communication Tools and Application to Evaluating Urban Soils. In Proceedings from the 2015 Minority Health and Health Disparities Grantees' Conference, as a Special Issue of the International Journal of Environmental Research and Public Health (IJERPH). *J. Community Medicine.* <http://www.mdpi.com/1660-4601/13/1/11>.
- Kaiser, M.L., M.L. Williams, N. Basta, M. Hand, and S. Huber. 2015. When vacant lots become urban gardens: Characterizing the perceived and actual food safety concerns of urban agriculture in Ohio. *J. Food Protect.* 78(11):2070-2080.
- Heather Henry, Marisa F. Naujokas, Chammi Attanayake, Nicholas T. Basta, Zhongqi Cheng, Ganga M. Hettiarachchi, Mark Maddaloni, Christopher Schadt, and Kirk G. Scheckel. 2015. Bioavailability-based in situ remediation to meet future lead (Pb) standards in urban soils and gardens. *Environ. Sci. Technol.* 49 (15), pp 8948–8958.
- Li, Jie, Kan Li, Xin-Yi Cui, N.T. Basta, Li-Ping Li, Hong-Bo Li, and L.Q. Ma. 2015. In vitro bioaccessibility and in vivo relative bioavailability in 12 contaminated soils: Method comparison and method development. *Science of the Total Environment.* 532:812-820.
- Carlson, J., J. Saxena, N. Basta, L. Hundal, D. Busalacchi. 2015. Application of organic amendments to restore degraded soil: effects on microbial properties. *Environ. Monit. Assess* 187(3):1-15.
- Sharma, Kuhuk, Nicholas T. Basta, and Parwinder S. Grewal. 2015. Soil heavy metal contamination in residential neighborhoods in post-industrial cities and its potential human exposure risk. *Urban Ecosystems.* 18: 115–132.

- Venteris, E.R., N.T. Basta, J.M. Bigham, and R. Rea, 2014. Modeling spatial patterns in soil As to estimate natural baseline concentration. *J. Environ. Qual.* 43:936-946.
- Jardine, P.M., M.A. Stewart, M.O. Barnett, N.T. Basta, S.C. Brooks, S. Fendorf, T.L. Mehlhorn. 2013. Influence of Soil Geochemical and Physical Properties on Chromium (VI): Sequestration and Bioaccessibility. *Environ. Sci. Technol.* 47:11241-11248.
- Sieblec, G., P. Kidd, M. Pecio, R. Galazka, M. Mench, N. Basta, R.L. Chaney, V. Alvarez-Lopez, B. Rodriguez-Garrido, J. Vandgronsveld, W. Friesl-Hanl, A. Cundy, M. Puschenreiter. 2013. Testing Single and Combinations of Amendments for Stabilization of Metals in Contrasting Extremely Contaminated Soils. *E3S Web of Conferences* 1: 01003. <https://doi.org/10.1051/e3sconf/20130101003>
- Juhasz, A.L., N.T. Basta, and E. Smith. 2013. What is required for the validation of in vitro assays for predicting contaminant relative bioavailability? Considerations and criteria. *Environmental Pollution* 180:372-375.
- Minca, K.K., N.T. Basta, and K.G. Scheckel. 2013. Using the Mehlich-3 soil test as an inexpensive screening tool to estimate total and bioaccessible Pb in urban soils. *J. Environ. Qual.* 42(5):1518-1526.
- Basta, N.T., and J. Wragg. 2013. Advances in Bioaccessibility Methodology. *Journal of Environmental Science and Health, Part A.* 48(6):593.
- Koch, I., Reimer, K.J., Bakker, M.I., Basta, N.T., Cave, M.R., Denys, S., Dodd, M., Hale, B.A., Irwin, R., Lowney, Y.W., Moore, M.M., Paquin, V., Rasmussen, P.E., Repaso-Subang, T., Stephenson, G.L., Siciliano, S.D., Wragg, J., Zagury, G.J. 2013. Variability of bioaccessibility results using seventeen different methods on a standard reference material, NIST 2710. *Journal of Environmental Science and Health, Part A.* 48(6):641-655.
- Whitacre, S.D., N.T. Basta, and E.A. Dayton. 2013. Soil Controls on Bioaccessible Arsenic Fractions. *J. Environ. Health Sci. Part A.* 48(6): 620-628.
- Minca, K.K., and N.T. Basta. 2013. Comparison of Plant Nutrient and Environmental Soil Tests to Predict Pb in Urban Soils. *Sci. Total Environ.* 445-446:57-63.

BOOKS / BOOK CHAPTERS (2013-PRESENT)

- 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. McIvor 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.

TEACHING AND ADVISING

ENVIRONMENT AND NATURAL RESOURCES 5262: SOIL CHEMICAL PROCESS AND ENVIRONMENTAL QUALITY

ENR 5262 (3 semester hr) has two 1-hr lectures and a 2-hr wet/computer laboratory. **Environment and Natural Resources 5262: Soil Chemical process and environmental quality.** A comprehensive study of chemical processes in soil systems that impact biogeochemical cycles and environmental quality. Topics including environmental fate of toxic substances, water quality, and remediation of contaminated soil. Course included hands-on experience with modern techniques used for soil chemical investigations including the USEPA MINTEQ model (offered every Autumn Semester).

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 or organic and inorganic contaminants. Pollutant transport through human and ecosystem exposure pathways.

Environment and Natural Resources 5279: URBAN SOILS AND ECOSYSTEM SERVICES: ASSESSMENT AND RESTORATION

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

PROFESSIONAL ACTIVITIES

SOCIETY MEMBERSHIP

Active

American Association for the Advancement of Science (AAAS) (member 2004-present)
 American Chemical Society (ACS) (member 1989-present)
 North American Colleges and Teachers of Agriculture (NACTA) (2018-present)
 Ohio Academy of Sciences (2016-present)
 Society for Ecological Restoration International (2010-present)
 Society for Environmental Toxicology and Chemistry (SETAC) (member 1996-present)
 Soil Science Society of America (SSSA) (member 1982-present)
 Union of Concerned Scientists (2012-present)
 Gamma Sigma Delta
 Sigma Xi, The Scientific Research Society, 1995

International and National Activities

INVITED PRESENTATIONS Delivered by N. Basta

Presentations	Invited Presentations
International and National Scientific Meetings	86

Regional and State Scientific Meetings	45
Other Scientific Audiences	32
Workshop Participation / Presentations	15
General Audience/Seminars	19
Total	197

EDITORIAL BOARDS

Editorial Board, *Soil Systems*, 2018-present.

Editorial Board, *Current Pollution Reports*; 2015-present

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 (active)

International Conference for Heavy Metals in the Environment (2016-present)

International Committee, International Conference on Biogeochemistry of Trace Elements (2001-present)

Bioavailability Research Group of Europe, 2004-present.

Bioavailability Research Group of Canada, 2007-present.

National Committees (active)

USDA National Institute of Food and Agriculture (NIFA) MultiState Project W-3170 (OHO01361-MRF), Beneficial Reuse of Residuals and Reclaimed Water: Impact on Soil Ecosystem and Human Health, 1992-present.

Soil Science Society of America, Methods of Soil; Analysis Committee, 2017-present.

Interstate Technology and Regulatory Council (ITRCweb.org). Bioavailability in Contaminated Soil Workgroup, 2014-2017.

Contaminated Soil Advisory Group, Society for Environmental Toxicology and Chemistry, 1997-present

Interstate Technology and Regulatory Council (ITRCweb.org). Bioavailability in Contaminated Soil Workgroup, 2014-present

Soil Science Society of America, Chair Division S-2 , Soil Chemistry, 2009-2012.

Contaminated Soil Advisory Group, Society for Environmental Toxicology and Chemistry, 1997-present

John Glenn Institute for Public Service and Public Policy, Affiliate Member, The Ohio State University, Columbus, OH., 2005-present.

U.S. EPA Emergency Response Team, Office of Solid Waste-Superfund. Amendments for Ecological Restoration, 2006-present.

Soil Science Society of America, Marion L. & Chrystie M. Jackson Soil Science Award (S482), 2006-2008.

Soil Science Society of America Fellows Committee, 2004-2006.

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

USDA NIFA Technical Committee, Project W3170, Beneficial Reuse of Residuals and Reclaimed Water: Impact on Soil Ecosystem and Human Health (formerly W2170), 1994-present. Co-Chair, 1999-2004

Residuals Management Research Committee, American Water Works Association, 1996-2004.

U.S. EPA In-place Inactivation and Natural Ecological Restoration Technologies (IINERT) Committee, 1997-2010. The IINERT Committee is one of seven action teams established in November 1995 under the USEPA Remediation Technologies Development Forum. The committee consists of representatives from government, industry, and academia. The charge of the group is to develop and improve environmental remediation technologies for cleanup of contaminated sites.