

Willie Harris

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Education:

Virginia Tech	B.S.	Agronomy	1975
Virginia Tech	Ph.D.	Soil Mineralogy	1984

Duties and Research Interests:

Teaching: Pedology, Soil Mineralogy, Soil Judging
Research: Research appointment in soil mineralogy and genesis. General research areas: Mineral stability and transformations in soils and sediments; properties and reactivities of minerals; mineral distributions as related to stability and genetic processes; soil properties as related to mineralogy; and hydrologic linkages to Aquod genesis. Recent research has addressed soil components, amendments and processes affecting phosphorus transport.

Professional Experience:

New River Health District	Soils Specialist	1975-1976
Virginia Tech	Research Associate, Soil Survey	1976-1980
Virginia Tech	Research Associate, Soil Mineralogy	1980-1984
University of Florida	Assistant Professor, Soil Mineralogy	1984-1989
University of Florida	Associate Professor, Soil Mineralogy	1989-1996
University of Florida	Professor, Soil Mineralogy	1996-Pres.

Awards:

University of Florida Research Foundation Professorship, 2007
 Fellow, Soil Science Society of America, 2005
 UF College of Agriculture and Life Sciences (CALs) Graduate Teaching/Advising Award, 2004-2005
 Co-Advisor of Konstantinos Makris, recipient, CALs Award of Excellence in Graduate Research, 2005
 Soil and Water Science Department Outstanding Teacher/Advisor of the Year, 2003
 Sigma Xi Graduate Research Award, Virginia Tech, 1985
 Gamma Sigma Delta Award of Merit for Graduate Research, Virginia Tech, 1985

Publications:

1. Book Chapters and Conference Proceedings

Harris, W.G., and L.W. Zelazny. 1985. Criteria assessment for micaceous and illitic classes in soil taxonomy. p.147-160. In J.A. Kittrick (ed.) Mineral classification of soils. Soil Sci. Soc. Am. Special Pub. No. 16.

- Carlisle, V.W., W.G. Harris, and G.W. Hurt. 1990. Humods of Florida. p. 63-73. *In* J. Kimball and R. Yeck (ed.) Proceedings of the Fifth International Soil Correlation Meeting, Northeast U.S. and Canada: Characterization, classification, and utilization of Spodosols. USDA-Soil Conservation Service, U.S. Government Printing Office, Lincoln, NE.
- Brown, R.B., K.K. Nielson, J.K. Otton, W.G. Harris, R.J. Kuehl, and C.E. Roestler. 1993. Linking information on geology and soils to create a map of radon risk. p. 67-76. *In* J.M. Kimball (ed.) Proc. 8th International Soil Management Workshop and Tour. July 10-24, 1992.
- Karathanasis, A.A., and W.G. Harris. 1994. Quantitative thermal analysis of soil minerals. p. 360-411. *In* J. Ammonette and L.W. Zelazny (ed.) Quantitative methods in soil mineralogy. Soil Sci. Soc. Am. Miscellaneous Publication. Soil Sci. Soc. Am. Madison, WI.
- Scudder, S., W.G. Harris, and M.E. Collins. 1994. Clay-sized mineral composition of anthropogenic and native soils on a Southwest Florida Pleistocene dune Island. P.161-174. *In* J. Foss (ed.) Proc. 1st Int. Conf. on Pedo-archaeology. Special Publication 93-03. Agric. Exp. Sta., Univ of Tennessee, Knoxville.
- Harris, W.G., and Hurt, W. 1999. Introduction to soils of subtropical Florida. p. 143-167. *In* K.R. Reddy, G.A. O'Connor, and C.L. Schelske (ed.) Phosphorus biogeochemistry in subtropical ecosystems.
- Reddy, K.R., D'Angelo, E.M., and Harris, W.G. 1999. Biogeochemistry of wetlands. p. G-89-g-119. *In* M. Sumner (ed.) Handbook of soil science.
- Rhue, R.D., and Harris, W.G. 1999. Phosphorus sorption/desorption reactions in soils and sediments. p. 187-206. *In* K.R. Reddy, G.A. O'Connor, and C.L. Schelske (ed.) Phosphorus biogeochemistry in subtropical ecosystems.
- Harris, W.G. 2001. Hydrologically-linked Spodosol formation in the Southeastern United States . p. 331-342. *In* J.L. Richardson and M.J. Vepraskas (eds.) Wetland soils: their genesis, hydrology, landscape, and separation into hydric and nonhydric soils. CRC Press, Boca Raton, FL.
- Harris, W.G. 2002. Phosphate minerals. p. 637-665. *In* J.B. Dixon and D. Schultz (eds.) Soil Mineralogy with Environmental Applications. Soil Sci. Soc. Am. Madison, WI.
- Harris, W.G. and G.N. White. 2008. X-ray diffraction techniques for soil mineral identification. p. 81-115. *In* A. Ulery and R. Drees (eds.) Methods of soil analysis: Part 5 – mineralogical methods. Soil Sci. Soc. Am. Madison, WI.
- Soukup, D.A., B.J. Buck, and W.G. Harris. 2008. Preparing soils for mineralogical analysis. p. 13-31. *In* A. Ulery and R. Drees (eds.) Methods of soil analysis: Part 5 – mineralogical methods. Soil Sci. Soc. Am. Madison, WI.
- Harris, W.G. 2011 Mineral distribution and weathering in the greater Everglades: implications for restoration. p. 4-27. *In* K.R. Reddy, G.R. Best, and F. Sklar (eds.) Biogeochemistry and water quality of the Greater Everglades. Critical Rev. Environ. Sci. Tech. Volume 41, supplement 1. Taylor and Francis, Philadelphia, PA.
- Schaetzl, R., and W.G. Harris. 2011 Spodosols. Handbook Soil Sci. (in press)

2. Refereed Journal Articles

- Parker, J.C., L.W. Zelazny, S. Sampath, and W.G. Harris. 1979. A critical evaluation of zero point of charge (ZPC) theory to soil systems. Soil Sci. Soc. Am. J. 43:668-673.
- Harris, W.G., S.S. Iyengar, L.W. Zelazny, J.C. Parker, D.A. Lietzke, and W.J. Edmonds. 1980. Mineralogy of a chronosequence formed in New River Alluvium. Soil Sci. Soc. Am. J. 44:862-868.
- Harris, W.G., J.C. Parker, and L.W. Zelazny. 1984. Effects of mica content on engineering properties of sand. Soil Sci. Soc. Am. J. 48:501-505.
- Harris, W.G., L.W. Zelazny, and J.C. Baker. 1984. Depth and particle-size distribution of talc in a

- Virginia Piedmont Ultisol. *Clays Clay Miner.* 32:227-230.
- Harris, W.G., L.W. Zelazny, J.C. Parker, J.C. Baker, R.S. Weber, and J.H. Elder. 1984. Engineering properties of soils as related to mineralogical and particle-size variables. *Soil Sci. Soc. Am. J.* 48:978-982.
- Harris, W.G., L.W. Zelazny, J.C. Baker, and D.C. Martens. 1985. Biotite kaolinization in Virginia Piedmont soils. I. Extent, profile trends, and grain morphological effects. *Soil Sci. Soc. Am. J.* 49:1290-1297.
- Harris, W.G., L.W. Zelazny, and F.D. Bloss. 1985. Biotite kaolinization in Virginia Piedmont soils. II. Zonation in single grains. *Soil Sci. Soc. Am. J.* 49:1297-1302.
- Harris, W.G., and V.W. Carlisle. 1987. Clay mineralogical relationships in Florida Haplaquods. *Soil Sci. Soc. Am. J.* 51:481-484.
- Harris, W.G., V.W. Carlisle, and K.C.J. Van Rees. 1987. Pedon zonation of hydroxy-interlayered minerals in Ultic Haplaquods. *Soil Sci. Soc. Am. J.* 51:1367-1372.
- Harris, W.G., V.W. Carlisle, and S.L. Chesser. 1987. Clay mineralogy as related to morphology of Florida soils with sandy epipedons. *Soil Sci. Soc. Am. J.* 51:1673-1677.
- Syslo, S.K., D.L. Myhre, and W.G. Harris. 1988. Calcium sulfate crystallization along citrus roots in a Florida soil exhibiting acid sulfate properties. *Soil Sci.* 145:124-134.
- Harris, W.G., K.A. Hollien, T.L. Yuan, S.R. Bates, and W.A. Acree. 1988. Nonexchangeable potassium associated with hydroxy-interlayered vermiculite from coastal plain soils. *Soil Sci. Soc. Am. J.* 52:1486-1492.
- Harris, W.G., and K.A. Hollien. 1988. Reversible and irreversible dehydration of hydroxy-interlayered vermiculite from Coastal Plain Soils. *Soil Sci. Soc. Am. J.* 52:1808-1814.
- Cabrera-Martinez, F., W.G. Harris, V.W. Carlisle and M.E. Collins. 1989. Evidence for clay translocation in coastal plain soils with sandy/loamy boundaries. *Soil Sci. Soc. Am. J.* 53:1108-1114.
- Cabrera-Martinez, F., W.G. Harris, V.W. Carlisle and M.E. Collins. 1989. Partitioning of clay-sized minerals in coastal plain soils with sandy/loamy boundaries. *Soil Sci. Soc. Am. J.* 53:1584-1587.
- Harris, W.G., K.A. Hollien, and V.W. Carlisle. 1989. Pedon distribution of minerals in coastal plain Paleudults. *Soil Sci. Soc. Am. J.* 53:1901-1906.
- Wang, H.D., W.G. Harris, and T.L. Yuan. 1989. Phosphate minerals in some Florida phosphatic soils. *Soil and Crop Soc. Fla. Proc.* 48:49-55.
- Comerford, N.B., W.G. Harris, and D. Lucas. 1990. Release of nonexchangeable potassium from a highly-weathered, forested Quartzipsamment. *Soil Sci. Soc. Am. J.* 54:1421-1426.
- Easterwood, G.W., J.J. Street, W.G. Harris, P.W. Weiblen, and H.A. Robitaille. 1991. Plant-induced smectite neogenesis from the mineral component of a simulated lunar soil. *Geoderma.* 48:107-112.
- Wang, H.D., W.G. Harris, and T.L. Yuan. 1991. Relation between phosphorus and iron in Florida phosphatic soils. *Soil Sci. Soc. Am. J.* 54:554-560.
- Wang, H.D., W.G. Harris, and T.L. Yuan. 1991. Noncrystalline phosphate in some Florida phosphatic soils. *Soil Sci. Soc. Am. J.* 54:665-669.
- Pennell, K.D., R.D. Rhue, and W.G. Harris. 1991. Effect of heat treatments on total charge and exchangeable cations of Ca-, Na-, and Li-saturated kaolinite. *Clays Clay Min.* 39:306-315.
- Harris, W.G., A.A. Morrone, and Sylvia Coleman. 1992. Occluded mica in hydroxy-interlayered vermiculite grains from a highly-weathered soil. *Clays Clay Min.* 40:32-39.
- Harris, W.G., K.A. Hollien, S.R. Bates, and W.A. Acree. 1992. Dehydration of hydroxy-interlayered vermiculite as a function of time and temperature. *Clays Clay Min.* 40:335-340.
- Stone, E.L., W.G. Harris, R.B. Brown, and R.J. Kuehl. 1993. Carbon storage in Florida Spodosols. *Soil Sci. Soc. Am. J.* 57:179-182.
- Martin, H.M., and W.G. Harris. 1993. Mineralogy of clay sediments in three phreatic caves of the Suwannee River Basin. *National Speleological Society Bulletin.* 54:69-76.
- Harris, W.G., H.D. Wang, and K.R. Reddy. 1994. Dairy manure influence on soil and sediment

- composition: Implications for P retention. *J. Environ. Qual.* 23:1071-1081.
- Olila, O.G., K.R. Reddy, and W.G. Harris. 1994. Forms and distribution of inorganic P in sediments of two shallow eutrophic lakes in Florida. *Hydrobiologia* 302:147-161.
- Wang, H.D., W.G. Harris, and K.R. Reddy. 1995. Stability of P forms in dairy-impacted soils under simulated leaching. *Ecol. Engin.* 5:209-227.
- Harris, W.G., S.H. Crownover, and N.B. Comerford. 1995. Experimental formation of Aquod-like features in sandy coastal plain soils. *Soil Sci. Soc. Am. J.* 59:877-886.
- Ouyang*, Y., D. Shinde, R.S. Mansell, and W.G. Harris. 1996. Colloid-enhanced transport of chemicals in subsurface environments: A review. *Critical Rev. in Environ. Sci. Tech.* 26:189-204.
- Harris, W.G., R.D. Rhue, G. Kidder, R.B. Brown, and R. Littell. 1996. Phosphorus retention as related to morphology and taxonomy of sandy coastal plain soil materials. *Soil Sci. Soc. Am. J.* 60:1513-1521.
- Zhou*, M., R.D. Rhue, and W.G. Harris. 1997. Phosphorus sorption characteristics of Bh and Bt horizons from sandy coastal plain soils. *Soil Sci. Soc. Am. J.* 61: 1364-1369.
- Ma*, L.Q., F. Tan, and W.G. Harris. 1997. Concentrations and distributions of eleven metals in Florida soils. *J. Environ. Qual.* 26:769-775.
- Chen, M., L.Q. Ma, and W.G. Harris. 1998. Assessment of phosphorus concentrations in different types of Florida surface soils. *Soil Crop Sci. Soc. Florida Proc.* 58:58-62.
- Tan, Z., W.G. Harris, and R.S. Mansell. 1999. Watertable dynamics across an Aquod-Udult transition in Florida flatwoods. *Soil Sci.* 164:10-17.
- Harris, W.G., and K.A. Hollien. 1999. Changes in quantity and composition of crystalline clay across E - Bh boundaries of Alaquods. *Soil Sci.* 164:602-608.
- Chen, M., L.Q. Ma, and W.G. Harris. 1999. Baseline concentration of 15 elements in Florida surface soils. *J. Environ. Qual.* 28:1173-1181 .
- Harris, W.G., and K.A. Hollien. 2000. Changes across artificial E - Bh boundaries generated under simulated fluctuating water tables. *Soil Sci. Soc. Am. J.* 64:967-973.
- Tan, Z., W.G. Harris, and L.Q. Ma. 2000. Comparison of groundwater colloids in adjoining soils of Florida flatwoods. *Soil Sci.* 165:124-134.
- Chen, M. L. Q. Ma, and Willie G. Harris .2001. Distribution of Pb and As in soil at a shooting range in Central Florida. *Soil Crop Sci. Soc. Florida Proc.* 60:15-20.
- Chen, M. L.Q. Ma, C. G. Hoogeweg, and W.G. Harris. 2001. Arsenic background concentrations in Florida surface soils: determination and interpretation *J. Environ. Forensics.* 2:117-126.
- Chirenje, T., L.Q. Ma, A.G. Hornsby, K. Portier, W.G. Harris, S. Latimer, E.J. Zillioux. 2001. Protocol development for assessing arsenic background concentrations in urban soils. *Environ. Forensics.* 2:141-153.
- Singh, S., L.Q. Ma, and W.G. Harris. 2001. Heavy metal interactions with phosphatic clay: sorption and desorption behavior. *J. Environ. Qual.* 30:1961-1968.
- Snyder, R.H., J.B. Sartain, J.L. Cisar, P. Nkedi-Kizza, W.G. Harris, and M.A. Brown. 2001. Investigation of coated sand for use in putting green construction. *Soil Crop Sci. Soc. Florida Proc.* 60:72-78.
- Chen, M. L. Q. Ma, and Willie G. Harris .2002. Arsenic concentrations in Florida surface soils: Influence of soil type and properties. *Soil Sci. Soc. Am. J.*66:632-640.
- Bonczek, J.L., W.G. Harris and P. Nkedi-Kizza. 2002. Monolayer to bilayer transitional arrangements of hexadecyltrimethylammonium cations on sodium-montmorillonite. *Clays Clay Min.* 50:11-17.
- Chen, M., L.Q. Ma, W.G. Harris, and X. Cao. 2002. Characterization of Pb in soils of a rifle/pistol shooting range in Central Florida. *Soil Sediment Contamination.* 11:1-17.
- Cao, X., L.Q. Ma, M. Chen, S.P. Singh, and W.G. Harris. 2002. Impacts of phosphate amendments on lead biogeochemistry in a contaminated site. *Environ. Sci. Technol.* 36:5296-5304.
- Cao, X, L.Q. Ma, S.P. Singh, M. Chen, and W.G. Harris. 2003. Phosphate-induced metal immobilization in a contaminated site. *Environ. Pollution.* 122:19-28.
- Cao, X., L.Q. Ma, M. Chen, D. Hardison, and W.G. Harris. 2003. Weathering of lead bullets and their

- environmental effects at outdoor shooting ranges *J. Environ. Qual.* 32: 526-534.
- Cao, X., L.Q. Ma, M. Chen, D. Hardison, and W. G.Harris. 2003. Lead transformation and distribution in Florida shooting range soils. *Sci. Total Environment.* 327:179-189.
- Hardison, D.W., Jr., L.Q. Ma, T. Luongo, and W.G. Harris. 2004. Lead contamination in shooting range soils from abrasion of lead bullets and subsequent weathering. *Sci. Total Environment.* 328:175-183.
- Makris, K., H., El-Shal, W.G. Harris, G.A. O'Connor, and T. O'Breza. 2004. Intraparticle phosphorus diffusion in a drinking water treatment residual at room temperature. *J. Colloid Interface Sci.* p. 417-423.
- Makris, K., H. , W.G. Harris, G.A. O'Connor, and T. O'Breza. 2004. Phosphorus Immobilization in Micropores of Drinking Water Treatment Residuals: Implications for Long-Term Stability. *Environ. Sci. Technol.* 38: (6590-6596).
- Farve, M., W.G. Harris, F. Dierberg, and K. Portier. 2004. Association between phosphorus and suspended solids in an Everglades treatment wetland dominated by submersed aquatic vegetation. *Wetlands Ecol. Mngt.* 12:365-374.
- Nair, V.D., and W.G. Harris. 2004. A capacity factor as an alternative to soil test phosphorus in phosphorus risk assessment. *New Zealand J. Agric. Res.* 47:491-497.
- Josan, M.S., V.D. Nair, and W.G. Harris. 2005. Associated release of magnesium and phosphorus from active and abandoned dairy soils. *J. Environ. Qual.* 34:184-191.
- Harris, W.G., S.H. Crownover, and J. Hinchee. 2005. Problems arising from fixed-depth assessment of deeply-weathered sandy soils. *Geoderma* 126:161-165.
- Makris, K., H. W.G. Harris, G.A. O'Connor, and H. El-Shal. 2005. Long-term phosphorus effects on evolving physicochemical properties of iron and aluminum. *J. Colloid Interface Sci.* 287:552-560.
- Rhue, R.D., V.D. Nair, and W.G. Harris. 2005. A quick field test for evaluating phosphorus mobility in sandy soils. *New Zealand J. Agric. Res.*48:367-375.
- Makris, K., H., G.A. O'Connor, W.G. Harris, and T. O'Breza. 2005. Substituting alum with aluminum-based drinking water treatment residuals to reduce soluble reactive phosphorus in poultry litter. *Commun. Soil Sci. Plant Anal.* 36:2657-2675.
- Makris, K., H. , W.G. Harris, G.A. O'Connor, T. O'Breza, and H.A. Elliot. 2005. Physicochemical properties related long-term phosphorus retention by drinking water treatment residuals. *Environ. Sci. Technol.* 39:4280-4289.
- Makris, K., H. and W.G. Harris. 2006. Time dependency and irreversibility of water desorption by drinking water treatment residuals: Implications for sorption mechanisms. *J. Colloid Interface Sci.* 294: (151-154).
- Rhue, R.D., W.G. Harris, and V.D. Nair. 2006. A retardation-based model for phosphorus transport in sandy soil. *Soil Sci.* 171:293-304.
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- Cao, X., W.G. Harris, M. Josan, and V.D. Nair. 2007. Inhibition of calcium phosphate precipitation under environmentally relevant conditions. *Sci. of Total Environ.*383:205-215.
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- Chrysostome, M., V.D. Nair, W.G. Harris, and R.D. Rhue. 2007. Laboratory validation of soil phosphorus storage capacity predictions for use in risk assessment. *Soil Sci. Soc. Am. J.* 71:1564-1569.
- Chrysostome, M., V.D. Nair, W.G. Harris, and R.D. Rhue. 2007. Minimizing confounding factors in phosphorus leaching assessment for dairy and poultry manure-amended soils. *Comm. Soil Sci.*

- Plant Anal. 38:975-987.
- Sarkhot, D., N.B. Comerford, E. Jokela, J.B. Reeves, III, and W.G. Harris. 2007. Aggregation and aggregate carbon in a forested southeastern coastal plain Spodosol. *Soil Sci. Soc. Am. J.* 71:1779–1787.
- Harris, W.G., A.C. Wilkie, X. Cao, and R. Sirengo. 2008. Bench-scale recovery of phosphorus from flushed dairy manure wastewater. *Bioresour. Technol.* 99:3036-3043.
- Cao, X., and W.G. Harris. 2008. Carbonate and magnesium interactive effect on calcium phosphate precipitation. *Environ. Sci. Technol.* 42(2):436-442.
- Cawley, N., and W.G. Harris. 2009. Vegetative effect on surface structural development in highly impacted sandy soils. *Soil Sci.* 174:258-263.
- Kuo, Yi-Ming, W.G. Harris, R. Munoz-Carpena, R.D. Rhue, and Y. Li. 2009. Apatite control of phosphorus release to runoff from soils of phosphate mine reclamation areas. *Water Air Soil Pollut.* 202:188-198.
- Kasozi, G.N., P. Nkedi-Kizza, and W.G. Harris. 2009. Varied carbon content of organic matter in Histosols, Spodosols, and carbonatic soils. *Soil Sci. Soc. Am. J.* 73:1313-1318.
- Cao, X., L. Ma, B. Gao, and W.G. Harris. 2009. Dairy manure-derived biochar effectively sorbs heavy metals and organic contaminants. *Environ. Sci. Technol.* 43:3285-3291.
- Liu, M., J.B. Sartain, L.E. Trenholm, and W.G. Harris. 2009. Comparison of soil phosphorus test procedures for St. Augustinegrass. *Commun. Soil Sci. Plant Anal.* 40:2234-2247.
- Harris, W.G., M. Chrysostome, T.A. Obreza, and V.D. Nair. 2010. Soil properties pertinent to horticulture in Florida. *Hort Tech.* 20:10-19.
- Cao, X., and W.G. Harris. 2010. Properties of dairy-manure biochar pertinent to its potential use in remediation. *Bioresour. Tech.* 101:5222-5228.
- Herrera, D.H., W.G. Harris, V.D. Nair, M. Josan, and C. R. Staples. 2010. Effect of dietary modifications of calcium and magnesium on reducing solubility of phosphorus in feces from lactating dairy cows. *J. Dairy Sci.* 93:2598-2611.
- Vasquez, G.M., S. Grunwald, and W.G. Harris. 2010. Spectroscopic models of soil organic carbon in Florida, USA. *J Environ Qual* 39: 923-934.
- Bhada, J.H., W.G. Harris, and J.W. Jawitz. 2010. Soil phosphorus release and storage capacity from an impacted subtropical wetland. *Soil Sci. Soc. Am. J.* 74:1816-1825.
- Mann, K.K., A. Schumann, T.A. Obreza, W.G. Harris, and S. Shukula. 2010. Spatial variability of soil physical properties affecting Florida citrus production. *Soil Sci.* 175:487-499.
- Chakraborty, D., V.D. Nair, M. Chrysostome, and W.G. Harris. 2011. Soil phosphorus storage capacity in manure-impacted Alaquods: Implications for water table management. *Agric. Ecosyst. Environ.* (in press).

Some recent C project presentations:

- Myers, D.B., S. Grunwald, A.M. Stoppe, W. Harris, and N. Comerford. 2010. Data Mining Methods for Spatial Models of Soil Organic Carbon in Florida, USA. *Submitted to The ASA, CSSA, and SSSA 2010 International Annual Meetings, Oct. 31-Nov. 4, 2010. Long Beach, CA.*
- Myers, D.B., S. Grunwald, A.M. Stoppe, N. Comerford, and W. Harris. 2010. Environmental factors relating to landscape variation in soil organic carbon fractions in Florida, USA. *Submitted to The ASA, CSSA, and SSSA 2010 International Annual Meetings, Oct. 31-Nov. 4, 2010. Long Beach, CA.*
- Myers D. B., S. Grunwald, N.B. Comerford, and W.G. Harris. 2010. Digital mapping of soil carbon fractions for regional assessment of soil carbon spatial variability in FL, USA. *To be presented by Grunwald at the 4th Global Workshop on Digital Soil Mapping. May 24-26, 2010. Rome, Italy.*

Myers D.B., S. Grunwald, N.B. Comerford, W.G. Harris, and G. Bruland. 2010. Comparison of chemometric and data mining techniques for modeling of soil carbon fractions with diffuse reflectance spectra in Florida, USA. *To be presented at the 19th World Congress of Soil Science*. Aug. 1-6, 2010. Brisbane, Australia.

Grants (1995 to present)

- Association of dieldrin with colloidal particles and aquifer materials in well water from Corry Station, Florida. 1995. W. Harris (PI), P. Nkedi-Kizza, and A. Moye. Northwest Florida Water Management District. 35 K.
- Background concentration of trace metals in Florida soils. 3/1996-2/1999. L. Ma (PI), W. Harris, A. Hornsby; Center for Solid and Hazardous Waste Management; 136 K.
- Field demonstration of metal immobilization in contaminated soils using P amendments. 4/1998-3/2002. L. Ma (PI), P. Nkedi-Kizza, and W. Harris. Florida Institute for Phosphate Research. 230 K.
- X-ray diffraction analysis of industrial powders. 1998. W. Harris (PI) . Lan Associates. 3 K.
- Environmental impact of lead shot at skeet shooting ranges in Florida. 4/1999-3.2002. L. Ma (PI) and W. Harris. Florida Center for Solid and Hazardous Waste Management. 190 K.
- Mineralogy, morphology, and elemental composition of colloids from aquifer material, groundwater, and fume dust. 1999. W. Harris.(PI) Lan Associates.6 K.
- Arsenic background concentrations in Florida urban soils. 1/200-12/2002. L. Ma (PI), W. Harris, A. Hornsby, and K. Pothier. Florida Power. 240 K.
- Assessment of colloidal P in Everglades agricultural runoff and treatment wetlands. 2000. W. Harris (PI). Florida FIRSST and DB Environmental Labs. 26 K.
- Mineralogy and P sorption properties of selected Florida soils. 2000. W. Harris (PI) and K. Reddy. USGS. 14 K.
- Recovery of P from dairy wastes. 9/2000-10/2003. W. Harris (PI) and A. Wilkie. Florida Dairy Check-Off Funds. 20 K.
- Manure P management in the Suwannee River Basin.9/ 2000-10/2004. W. Harris (PI), V. Nair, R. Rhue, D. Graetz, R. Mylavarapu, and G. Kidder. USDA. 671 K.
- Potential impact of sediment dredging on internal phosphorus loading in Okeechobee Basin. 1999-2002. K. Reddy (PI), J. White, , M.M. Fisher, and W. Harris. South Florida Water Management District. 253 K.
- Mineralogical properties of selected Florida aquifer samples. 2001. W. Harris.(PI). Environmental Consulting and Technology, Inc. 6 K.
- Recovery of P from dairy wastes at a pilot scale. 9/2002-10/2004. W. Harris (PI) and A. Wilkie. Florida Dairy Check-Off Funds. 20 K.
- Solid-state characterization of particulate phosphorus within the Everglades Agricultural Area and downstream watersheds. 2002-2003. S. Daroub(PI), W. Harris, and F. Dierberg. Subcontract from S. Daroub. 32 K.
- Particle-size analyses of selected hydric soils. 2004. W. Harris (PI). St. Johns River Water Management District. 4 K.
- Chemical and textural analysis of Florida soils. 2001-2005. Florida Museum of Natural History. 7.5 K.
- Manure-derived components and their influence on long-term phosphorus stability in soils.2002-2005. W. Harris (PI), V. Nair, D. Graetz, and M. Hall. USDA-NRI. 287 K.
- Site-specific determination of soil capacity to assimilate or release P applied as manure, fertilizer, compost, or biosolids. 2006. W. Harris (PI), V. Nair, R.D. Rhue, D. Graetz, and G.A. O'Connor. FL Dep. Consumer Services. 140 K.
- Protocol development to evaluate the effect of water table management on phosphorus release to drainage water. 2006-2010. V.D. Nair (PI), W.G. Harris, R.D. Rhue, and D.A. Graetz. FL Dep. Consumer

Services. 431 K.

Rapid assessment and trajectory modeling of changes in soil carbon across a southeastern landscape. 2007-2010. S. Grumwald, PI), N. Comerford, G. Bruland, and W. Harris. USDA-NRI. 376 K.

Mineralogy and chemistry of retention pond sediments. 2008-2011. W. Harris (PI). U.S. Geological Survey. 13 K.

Mineralogy of Kissimmee River Basin soils and sediments. 2010. W. Harris (PI) and U. Garfield. U.S. Geological Survey. 5 K.

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