

Curriculum Vita
Wayne E. Woldt, Ph.D., P.E.

Title: Associate Professor, Biological Systems Engineering and School of Natural Resources.

Address: 232 L.W. Chase Hall
University of Nebraska-Lincoln
Lincoln, NE 68583-0726

Ph. (402) 472-8656 Fax. (402) 472-6338
E-mail. wwoldt1@unl.edu

Assignment: Agricultural Research Division	35%
Extension Division	35%
School of Natural Resources (Extension)	25%
Service	5%

Education:

Ph.D. Civil Engineering, University of Nebraska - Lincoln, 1990
M.S. Civil Engineering, University of Nebraska - Lincoln, 1986
B.S. Civil Engineering, Colorado State University, 1978

Experience:

7/97 to present	Associate Professor, Biological Systems Engineering University of Nebraska-Lincoln
4/91 to 7/97	Assistant Professor, Biological Systems Engineering University of Nebraska-Lincoln
8/90 - 4/91	Visiting Assistant Professor, Civil Engineering University of Nebraska-Lincoln
9/87 - 8/90	Graduate Research Engineer, Civil Engineering University of Nebraska-Lincoln

Graduate Faculty Member: May 18, 1992

Graduate Faculty Fellow: September 18, 1996

Tenure Granted: July 1, 1997

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Professional Interests:

Research and Extension in Environmental and Water Resources Engineering. General areas of interest include application of unmanned aircraft for agriculture and natural resources, simulation modeling with emphasis on enhancing hydrologic data sets through use of unmanned aircraft systems and simulation of conjunctive surface/groundwater systems. Specific areas of research and teaching include: deployment of unmanned aircraft systems to conduct hydrologic investigations; deployment of unmanned aircraft for sensing water environment and agriculture; consideration of imprecision in environmental and hydrologic systems, and their management using soft computing techniques; methods to consider challenges of scale translation in groundwater simulation modeling; adaptive management of complex water and environment systems, modeling fate and transport of solutes in the environment; use of geoelectrical data to define site hydrogeology; geostatistical mapping and simulation modeling of environmental phenomena; detection and mapping of subsurface contamination at waste disposal sites; and development of systems analysis approaches for management of surface and groundwater systems. Specific areas of Extension interest include advancing the onsite wastewater industry, and water well industry in Nebraska, and research based education on unmanned aircraft.

Professional Engineering Registration:

Registered Professional Engineer - State of Nebraska (Environmental)
Licensed Water Well Driller – State of Nebraska

Professional Affiliation (past and present):

- Member, American Society of Civil Engineers (ASCE)
- Member, American Society of Agricultural and Biological Engineers (ASABE)
- Member, Nebraska Section, ASCE
- Member, Nebraska Section, ASABE
- Member, Nebraska Cooperative Extension Association (Specialist Section)
- Member, Nebraska Water Environment Association
- Member, Water Environment Federation
- Member, National Onsite Wastewater Recycling Association
- Chair, National Science Foundation WATERS Network Modeling Committee
- Member, National Science Foundation CLEANER Cyberinfrastructure Committee
- Member, Nebraska Onsite Waste Water Association
- Member, Consortium of Institutes for Decentralized Wastewater Training
- Member, National Science Foundation CLEANER/CUAHSI Executive Committee
- Member, National Ground Water Association
- Serve as the CUAHSI contact and representative for UNL
- Member of the ASCE Groundwater Management Committee
- Member, Nebraska Well Drillers Association

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Honors and Awards:

- 1987 Engineer In Training Certificate
- 1988 Chi Epsilon (Civil Engineering Honorary)
- 1992 ASAE Blue Ribbon for Don't Bag It poster display
- 1995 Nominated - Faculty Service Award (CET)
- 1995 Nominated - Outstanding New Extension Specialist (NCEA)
- 1996 Nominated - Recognition of Junior Faculty for Excellence in Research
- 1996 Nominated - Outstanding New Extension Specialist (NCEA)
- 1997 Nebraska Cooperative Extension Association - Outstanding New Specialist
- 1997 Epsilon Sigma Phi State Team Award for State Fair Earthbound Exhibit
- 1997 Cooperative Extension Excellence in Team Programming for NUFACTS
- 1997 ASAE Best Paper Presentation at International Conference, August 1997
- 1998 Invited to serve on the EUFIT'99 International Program Committee
- 1999 Professional Development Leave to Wageningen, Netherlands
- 1999 College of Engineering and Technology Multidisciplinary Research Award
- 2001 IANR Team Award
- 2004 ASAE Blue Ribbon Award
- 2006 15-Year Employee Service Award
- 2011 20-Year Employee Service Award
- 2016 ASABE Presidential Citation for Leading Series of UAS Articles

Summary of Professional Achievements:

Established a reputation for research and development in the areas of unmanned aircraft for agriculture with current emphasis on flight characteristics and suitability for sensor deployment across large land areas. Additional areas of achievement include using fuzzy set theory for considering imprecision in water resource systems; participating in the National Science Foundation initiative to shape the future of environmental engineering and education (CUAHSI); developed expertise in using innovative fuzzy logic approaches for simulation of fate and transport in the vadose zone and constructed wetlands; use of soft computing in the context of adaptive infrastructure management across watersheds; exploration of multi-scale modeling of biofilm for wastewater treatment; risk assessment for unregulated waste disposal sites; risk management for nitrate-contaminated groundwater supplies; life cycle analysis techniques for evaluation of pollution prevention alternatives; and unregulated landfill site characterization using advanced geophysical and geostatistical methods. Significant impacts have been realized in extension programming efforts that have resulted in the creation of Partners in Pollution Prevention (a project that I initiated in 1996, and remains active 25 year later); provided leadership to the onsite wastewater industry in Nebraska in their transition to new certification regulations; and worked as a team member in the development of new drinking water publications. Recently led a team in the development and deployment of the UNL WATER Machine, a mobile water resources education system employing interactive physical groundwater model and multimedia resources. Established a leadership role in the use of innovative computer-based multimedia educational methods for delivery of extension programs. Active in presenting research and extension projects at local, national and international conferences, workshops and symposia.

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Research and Extension Support:

Projects under Review:

Ghandi, R. (Principal Investigator), Linzell, D. (Co-PI), Sim, C. (Co-PI), Ricks, B. (Co-PI), Khazanchi, D. (Co-PI), Woldt, W. (Co-PI), Wood, R. (Co-PI), and Wittich, C. (Co-PI), SMart big data pipelines for Aging Rural bridge Transportation Infrastructure (SMARTI), Submitted to National Science Foundation, \$999,985.00.

Franti, T. (Principal Investigator), Woldt, W. (Co-PI), Mittelstet, A., (Co-PI), and Jasa, P. (Co-PI), Engaging Agricultural Producers with Innovative Techniques to Control Ephemeral Gully Erosion, Submitted to USDA CARE, \$249,815.00.

Current Research Projects:

Resilience and Adaptive Management of Groundwater and Watershed Systems, Woldt, W. Project sponsored by University of Nebraska-Lincoln Agriculture Research Division. Objective: bring innovative technologies and solutions to bear upon the fundamental challenge of groundwater resource allocation, 2011-2017.

Neale, C. (Principal Investigator), Woldt, W. (Co-PI), Ge, Y. (Co-PI), Heeren, D. (Co-PI), Luck, J. (Co-PI), Meyer, G. E. (Co-PI), "Improving Variable Rate Irrigation for Water Efficiency", Department of Agriculture-AFRI, \$499,817.00, 2017-2020.

Tang, Z. (Principal Investigator), Woldt, W. (Co-PI)), "Wetland Characterization using Small Unmanned Aircraft System", Environmental Protection Agency, Federal, Research, \$151,302.00, 2016-2019.

Reynolds, D. (Principal Investigator), Woldt, W. (Co-PI), "Big Red Biosecurity: A Comprehensive Educational Biosecurity Program for Nebraska Poultry That Explores Use of Unmanned Aircraft Systems (Drone) Technology", US Department of Agriculture, Federal, Research, \$24,897.00, 2017-2018.

Woldt, W. (Principal Investigator), 90757, Contract, "Safety Beacon for Unmanned Aircraft", Nebraska Aviation Trades Association, Associations/Foundations, Research, \$6,000.00, 2016-2017.

Taylor, J. (Principal Investigator), Woldt, W. (Co-PI), , Bickford, N. (Co-PI), Bickford, S. (Co-PI), Dasgupta, R. (Co-PI), Cammack, R. (Co-PI), Sharif, H. (Co-PI), Wardlow, B. (Co-PI), Grant, "Planning Grant for a Conference on Remote Sensing and Spatial Analysis for Agricultural Productivity and Sustainability", University of Nebraska, Universities, Research, \$19,962.00, 2016-2017.

Woldt, W. (Principal Investigator), Grant, "Improving Variable Rate Irrigation Efficiency using a Real-time Soil Moisture Adaptive Control Model Informed by Sensors Deployed

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on Unmanned Aircraft", Robert B. Daugherty Global Water for Food Institute, Universities, Research, \$16,000.00, 2015-2017.

Woldt, W. (Principal Investigator), Robbins, J. (Co-PI), Villegas, V. (Co-PI), Hinkamp, D. (Co-PI), Saraswat, D. (Co-PI), Grant, "Proposal to Create an eXtension Learning Network for Unmanned Aircraft Systems in Agriculture", eXtension, Federal, Instruction/Training, \$100,000.00, 2015-2017.

Neale, C. (Principal Investigator), Woldt, W. (Co-PI), Ge, Y. (Co-PI), Meyer, G. (Co-PI), IC-975, Grant, "Improving Variable Rate Irrigation Efficiency using a Real-time Soil Moisture Adaptive Control Model Informed by Sensors", Internal, Universities, Research, \$49,695.00, 2015-2016 (extended to 2017).

Woldt, W. (Principal Investigator), 89123, Contract, "Extension Wastewater Training", Nebraska Dept Environmental Quality, State Agencies, Public Service, \$12,000.00, 2015-2017.

Current Extension Projects:

Proposal to Create an eXtension Learning Network for Unmanned Aircraft Systems in Agriculture, Woldt, W., Robbins, J., Villegas, V., Hinkamp, D., Saraswat, D. Project sponsored by eXtension, total project funding @ \$100,000.00, 2015-2017.

Woldt, W. (Principal Investigator), Contract, "Extension Wastewater Training", Nebraska Dept Environmental Quality, State Agencies, Public Service, \$7,500.00, 2015-2017.

Extension Wastewater Training, Woldt, W. Project sponsored by NE Dept. Environmental Quality, total project funding @ \$12,000.00. 2015-2017.

Completed Research and Extension Projects:

Acquisition of a Global Positioning System, Bashford, L. and W. Woldt, University of Nebraska-Lincoln, total project funding @ \$19,500. Objective: acquire a global positioning system and implement the system, with differential correction, in the department and in landfill research, 1992.

Development of Pollution Prevention Program for Small Quantity Generators in EPA Regions VII and VIII, Dahab, M. and W. Woldt, USEPA Hazardous Substance Research Center, total project funding @ \$39,814. Objective: develop pollution prevention tool kits for small quantity waste generators to plan their own pollution prevention program, 1992-1993.

Risk-Cost Management for Nitrate-Contaminated Ground Water Under Uncertainties, Dahab, M., Woldt, W., and I. Bogardi, USDA-CSRS, total project funding @ \$168,833. Objective: develop method for identification of cost-effective risk management techniques for nitrate-contaminated ground water including water supply treatment, management practices and precision farming, 1992-1994.

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Modeling and Analysis of the Kearney Water Supply System, Dahab, M., Woldt, W., Hotchkiss, R., W. Kelly, City of Kearney, total project funding @ \$138,184. Objective: develop conjunctive surface/ground water model of the Kearney well field for modeling system expansion alternatives and optimization of the system operation, 1992-1994.

Waste Management: Development of Pollution Prevention Educational Materials for Farms and Small Acreages, Niemeyer, S., Woldt, W., Dahab, M., and R. Grisso, USEPA Hazardous Substance Research Center, total project funding @ \$19,614. Objective: develop a pollution prevention education program that addresses the unique needs of production agriculture and small acreage owners in rural areas, 1993-1994.

A Non-Intrusive Landfill Hazard Ranking System: Application of Geoelectric and Soil Vapor Analysis Methods, Woldt, W., and D. Jones, United States Geological Survey, total project funding @ \$92,846. Objective: utilize combined geoelectric and soil vapor analysis methods within the context of advanced geostatistics to define the extent of solid waste and environmental hazard potential at unregulated disposal sites located in rural areas, 1993-1995.

Evaluating the Use of Variable Rate Application Technology to Minimize Nitrate Pollution of Water, Schepers, J. and D. Martin, USEPA, funding @ \$503,000. Objective: evaluate the potential for variable rate application methods in reducing the risk of water contamination from production agriculture activities, project cooperator, 1993-1996.

Remediation of Contaminated Soils and Sediments and Underground Storage Tanks: Short Courses, Rohde, J., Kelly, W., Keefer, G., and W. Woldt, USEPA Hazardous Substance Research Center, total project funding @ \$31,308. Objective: deliver short courses on remediation of soils and sediments and underground storage tanks to professional audiences in USEPA Regions VII and VIII, 1994.

Development of a Multimedia Based Educational Program on Integrated Solid Waste Management, Woldt, W., and S. Niemeyer, NDEQ, total project funding @ \$21,490. Objective: develop computer-based multimedia kiosk for education about integrated solid waste management, 1994-1995.

Waste Management: Development of Pollution Prevention Interactive Computer Educational Project for Householders, Niemeyer, S. and W. Woldt, USEPA, total project funding @ \$13,958. Objective: enhance the existing computer-based multimedia program through further development to include residential waste management issues, 1994-1995.

Transfer of Multi-Media Pollution Prevention Technology to the Commercial and Industrial Sector in Nebraska, Woldt, W., and M. Dahab, USEPA, extension portion of a project with total project funding @ \$468,358. Objective: extension portion of project to develop a modular computer-based multimedia educational program on pollution prevention in business and industry, 1994-1996.

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Application of the Farmstead Assessment System for Pollution Prevention in Nebraska Production Agriculture, Hay, D., Woldt, W., and R. Grisso, USEPA, total project funding @ \$91,767. Objective: prepare new, and modify existing, Farmstead Assessment System educational materials for application to the specific needs and requirements of Nebraska, 1994-1996.

Development of a New Life Cycle Analysis Technique to Assess Pollution Prevention Opportunities, Woldt, W., and M. Dahab, USEPA, research portion of a project entitled Transfer of Multi-Media Pollution Prevention Technology to the Commercial and Industrial Sector in Nebraska, total project funding @ \$468,358. Objective: develop a new methodology for completing a life cycle analysis of industrial pollution prevention alternatives using multiple criteria ranking as a foundation, 1994-1996.

Measuring Groundwater Quality Impacts from Feedlot Runoff and Retention Ponds and Waste Lagoons Using Integrated Geophysical and Bottom Sampling Methods, Schulte, D. and W. Woldt, United States Geological Survey, total project funding @ \$107,190. Objective: establish level of correlation between measured contamination concentration and indirect geoelectrical data sources, and map extent of subsurface contamination in the area surrounding livestock ponds and lagoons, 1994-1996.

Waste Management: Development of Pollution Prevention Educational Materials for Farms and Small Acreages, Niemeyer, S., Woldt, W., Dahab, M., and R. Grisso, USEPA Region VII, total project funding @ \$41,800. Objective: complete development and implementation of a pollution prevention education program that addresses the unique needs of waste management for production agriculture and small acreage owners in rural areas, 1995-1996.

Development of Fuzzy Rule-Based Approaches to Model Solute Transport in the Vadose Zone, Woldt, W., UNL College of Engineering NRI Engineering Grant Program, funding @ \$19,487, Objective: develop a new technique for simulation of solute transport in the vadose zone using innovative fuzzy rule-based methods, 1996.

Conversion of Waste Management Multimedia Kiosk to Authorware Version 3, Woldt, W., Niemeyer, S., and B. Sandhorst, NDEQ, total project funding @ \$6,750. Objective: improve selected video segments and update program to Authorware 3.5, 1996.

Application of the Farmstead Assessment System for Pollution Prevention in Nebraska Production Agriculture, Hay, D., Woldt, W., and R. Koelsch, USEPA/NDEQ, total project funding @ \$266,333. Objective: initialize statewide implementation of the Farm-A-Syst program in Nebraska, 1996-1998.

Pollution Prevention Opportunity Assessment for a Metropolitan School District in Nebraska, Woldt, W., and J. Stansbury, NDEQ, total project funding @ \$117,046. Objective: conduct a pollution prevention opportunity assessment for Omaha Public School District by completing a waste characterization and analysis of data, 1996-1998.

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An Interagency Plan for Providing Pollution Prevention and Environmental Services to Nebraska Business and Industry, Hygnstrom, J., Woldt, W., and M. Dahab, National Institute for Standards and Technology/Nebraska Department of Economic Development, total project funding @ \$136,269. Objective: establish a baseline of pollution prevention knowledge in business and construct a statewide strategy to increase awareness and use of methodology, 1996-1998.

Maintenance of a Regional Pollution Prevention Web Page, Woldt, W., USEPA, total project funding @ \$11,462. Objective: maintain a regional web page on the Internet to support regional pollution prevention roundtable activities, 1997.

Enhancing Extension Involvement in the Nebraska Mandate Management Initiative, Woldt, W., Water Center/Cooperative Extension, total project funding @ \$7,000. Objective: Deliver inservice training opportunities to Extension staff and establish an electronic communication network on the Internet, 1997.

Onsite Wastewater Treatment Education, Woldt, W., and S. Skipton, USEPA/NDEQ, total project funding @ \$212,289. Objective: develop and deliver an extension educational program for on-site wastewater treatment in Nebraska, 1998-2002.

An Assessment of Factors Indicating Well Vulnerability in Nebraska, Dvorak B., Woldt, W., and M. Bakker, USGS/UNL Water Center. Objective: develop an initial assessment of well contamination by viral sources in Nebraska and model data using groundwater modeling techniques, 1999-2001.

Geographic Information System Rural Bus Routing Model for Rural Communities, submitted by Kinkade GIS, with primary project cooperator Woldt, W., 6 month, \$69,709. Objective: SBIR grant has been funded by USDA Rural Development Program to expand a student intern projects focusing on the use of GIS-based analysis techniques for planning rural school bus transportation routes, 2001.

Modeling Carbon Tetrachloride Fate and Transport in Groundwater to Protect Community Water Supply Systems, Bakker M., and W. Woldt, Water Center/Nebraska Mandate Management Initiative, total project funding @ \$54,000. Objective: evaluate groundwater modeling techniques and their role in protection of community water supply systems, 1999-2002.

Evaluation of Constructed Wetland Performance and Pilot Study of Vertical Flow Constructed Wetland for Wastewater Treatment, Stansbury, J., Woldt, W., Dahab, M., Schulte, D. and T. Zhang, Water Center/Nebraska Mandate Management Initiative, total project funding @ \$291,100. Objective: monitor community constructed wetland systems and establish experimental constructed wetland facility at Roger Farm, 1998-2004.

Quantifying the Performance of an Electronic Nose for Odor Measurement, Adekoya, T., and W. Woldt, Undergraduate Creative Activities & Research Experiences (UCARE)

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sponsored project @ \$1,600. Objective: develop soft computing-based method to map human response to E-nose equipment response, 2003-2004.

Pollution Prevention Technical Assistance in Nebraska: Focus on Agricultural Sector, Dvorak, B., Woldt, W., Dahab, M., and D. Schulte, USEPA, Region VII, total project funding @ \$87,763. Objective: use research-based information in an extension project that involves undergraduate engineering student interns delivering pollution prevention technical assistance and training to business and industry, 2004-2005.

Private Drinking Water Supplies in Nebraska, Skipton, S., and W. Woldt, project sponsored by Nebraska Cooperative Extension, total project funding @ \$7,620. Objective: develop educational materials for domestic water well users under threat from potential contaminants to help them select best alternative for providing safe and adequate domestic water supply, 2004-2006.

Soft Computing Approaches to Odor Measurement Using Electronic Nose Technology, Woldt, W., Biological Systems Engineering Research Program, total project funding @ \$20,000. Objective: develop soft computing-based method to map human response to E-nose equipment response, 2004-2006.

Management of Groundwater for Community Supply and Agriculture Production, Woldt, W., Biological Systems Engineering Research Program, total project funding @ \$16,000. Objective: develop case study application of ModFlow-based optimal management of community water supply well field located in intensively irrigated area, 2004-2006.

On-Site Wastewater Training Curriculum, Woldt, W., Skipton, S. and J. Hygnstrom, USEPA/Nebraska Dept. of Environmental Quality, total project funding @ \$162,005. Objective: develop on-site curriculum program for on-site wastewater education in Nebraska, 2004-2006. (This phased out in early part of 2006)

Targeted use of Farm-A-Syst Tools to Focus BMP Implementation in an Impaired Watershed, Skipton, S., W. Woldt, Nebraska Cooperative Extension, total project funding @ \$5,500. Objective: use multiple criteria analysis on Farm-A-Syst data within a GIS framework to focus BMP implementation in a TMDL-impaired watershed, 2003-2006.

Pollution Prevention Technical Assistance for Nebraska Businesses, Dvorak, B., Woldt, W., Dahab, M., and D. Schulte, Nebraska Department of Economic Development, total project funding @ \$199,368. Objective: use research-based information in an extension project that involves undergraduate engineering student interns delivering pollution prevention technical assistance and training to business and industry, 2003-2006.

NUFACTS Information Center Website Development, Varner, D., Frogge, M.J., Skipton, S., Wilson, J., Brand, G., Hansen, S., Ogg, B., Henneman, A., Schroeder, D., Cochran, S., Bartos, L., Ferraro, D., Ringenberg, C., Stauffer, M., and W. Woldt, Nebraska

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Cooperative Extension, total project funding @ \$7,500. Objective: migrate NUFACETS to website, 2005-2006.

Pollution Prevention Technical Assistance and Training for Small Business and Industry in Nebraska, Dvorak, B., Woldt, W., Dahab, M., and D. Schulte, project sponsored by USEPA, NDEQ, and Nebraska Department of Economic Development (NDED), total project funding @ \$966,697 + \$98,239. Objective: develop research-based pollution prevention case studies and measures of pollution prevention effectiveness as a significant component of delivering technical assistance and training to small business and industry, 1996-2007.

Research Leading Toward a Great Plains Environmental and Hydrologic Observatory. Woldt, W., Hoagland, K., Irmak, A., Ramamurthy, B., Samal, A., Ci, S., Istanbuluoglu, E., Burbach, M., Gosselin, D., G. Meyer. Project sponsored by UNL Office of Research, total funding @ \$5,000. Objective: Partner with neighboring academic institutions to develop a research framework for prospective Great Plains WATERS Network Observatory, 2008-2009.

Simulation Modeling of Surface and Groundwater Interaction in a High Performance Computing Environment. Woldt, W., Chen, X., A. Samal. Project sponsored by UNL Cyberinfrastructure Research Development Program, total funding @ \$25,000 Objective: implement a conjunctive surface-groundwater modeling system in a high performance computing environment, 2006-2008 (with no cost extension to 2009).

On-Site Wastewater Training Center, Woldt, W., Skipton, S. and J. Hygnstrom, Nebraska Cooperative Extension, total project funding @ \$12,000. Objective: develop on-site training aids and initial training center for on-site wastewater education in Nebraska, 2004-2009.

Multi-Scale Approaches to Natural, Economic, and Social Resilience and Adaptation at the Interface of Surface and Groundwater Through Trans-disciplinary Research Across Watersheds with Consideration for Climate Effects. Woldt, W., Snow, D., Hoagland, K., Schoengold, K., Yoder, R., Diego, R., Harvey, F., Allen, C., M., Burbach. Project sponsored by IANR: Strategic Plan, total project funding @ \$15,000. Objective: engage in development of a science plan for great plain hydrologic research, 2010-2011.

GIS Framework for Hydrologic Observatory Research: Development of a Pilot Hydrologic Information System in the Republican Basin. Woldt, W. Project sponsored by UNL Water Resources Research Initiative, total funding @ 15,000. Objective: Implement a pilot scale hydrologic information system in the Republican Basin, Nebraska, 2009-2010.

Media Support for The WATER Machine. Woldt, W. Project sponsored by UNL School of Natural Resources, total funding @ \$3,280. Objective: develop new media materials to support The WATER Machine education system, June, 2011.

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Advancing Onsite Wastewater Treatment in Nebraska: Alternative Treatment Systems and Focused Training for Industry and Agencies, Woldt, W., and S. Skipton. Project sponsored by workshop revenues, total project funding @ \$83,077. Objective: develop and deliver next level of education and training materials for alternative technology onsite systems, 2010-2011.

Application of Unmanned Aircraft Systems in Agriculture and Natural Resources, Woldt, W., Kocher, M., Meyer, G., Franti, T., Luck, J., Woldstad, J., Billesbach, D., R. Ferguson. Project sponsored by IC-836 Grant, internal, total project funding @ \$26,145.64, July-September 2012.

Water Resource Management Modeling and Decision Support System for Sustainable Food Production, Martin, D., Woldt, W., Eisenhauer, D., Irmak, S., Irmak A., Supalla, R., Schoengold, K., and Harvey, E. Project sponsored by Robert B. Daugherty Water for Food Institute, total project funding @ \$99,800, 2011-2012.

Co-Sponsorship of a Spring 2012 Surface and Groundwater Modeling Lecture Series, Dvorak, B., Woldt, W., and L. Benson. Project sponsored by Robert B. Daugherty Water for Food Institute, total project funding @ \$8,000, 2011-2012.

Development of a prototype large format water model entitled "The WATER Machine", Woldt, W., Corr, A., and S. Skipton. Action Team project sponsored by UNL Extension, total project funding @ \$7,200. Objective: Increase the size of tabletop water models to allow for greater engagement of learners, 2008-2009 (continued into 2012 with development of another water model).

Consumer Information: Managing Private Drinking Water Supplies. Woldt, W., and S. Skipton. Project sponsored by Nebraska Well Drillers Association, total project funding @ \$24,000. Objective: develop research-based information to help consumer manage their private drinking water systems, 2010-2012.

Connecting Industry Partners & Extension with Nebraska Agricultural Education, VanDeWalle, B., Thompson, L., Luck, J., Woldt, W., Pekarek, K., Burr, C., Zoubek, G., Irmak, S., Nygren, A., Mueller, N., Killinger, E., Timmerman, A., Rees, J., Kreifels, M. Project sponsored by University of Nebraska Extension Dean's Office, total project funding @ \$10,000.00. July 2014-June 2015.

Onsite Industry Education and Training for Mound Systems and Title 124 Changes, Woldt, W., and Skipton, S. Project sponsored by USEPA and NDEQ, total project funding @ \$42,633. 2012-2014.

Research Publications:

Research Reports:

Woldt, W. (2015). Certificate of Waiver or Authorization to Fly Unmanned Aircraft

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Systems (Droidworx). (pp. 23). Washington, D.C.: FAA UAS COA 2015-CSA-140-COA. Federal Aviation Administration. *Primary association: Research/ARD. Activity conducted at an IANR facility: Agricultural Research and Development Center. Status: Accepted*

Woldt, W. (2015). Certificate of Waiver or Authorization to Fly Unmanned Aircraft Systems (Tempest). (pp. 23). Washington, D.C.: FAA UAS COA 2015-CSA-146-COA-R. Federal Aviation Administration. *Primary association: Research/ARD. Activity conducted at an IANR facility: Agricultural Research and Development Center. Status: Accepted*

Woldt, W., Beck, B., Kumar, P., and T. Papanicolaou, 2007, "WATERS Network Modeling Plan," WATERS Network Project Office, <http://www.watersnet.org/plngdocs.html>, June 8.

Finholt, T., Van Briesen, J., Costello, A., Mazurek, M., Myers, J., Minsker, B., Woldt, W., Hobby, R., Piasecki, M., Zaslavsky, I., 2007, "WATERS Network Cyberinfrastructure Plan," WATERS Network Project Office, <http://www.watersnet.org/plngdocs.html>, March 19.

Refereed Journal Articles - Published:

Stansbury, J., Woldt, W., Bogardi, I., and A. Bleed, 1991, "Decision Support System for Water Transfer Evaluation," *Water Resources Research*, V.27, N.4, p.443-451.

Woldt, W., Bogardi, I., Kelly, W., and A. Bardossy, 1992, "Evaluation of Uncertainties in a Three-Dimensional Groundwater Contamination Plume", *Journal of Contaminant Hydrology*, V.9, p.271-288.

Woldt, W., and I. Bogardi, 1992, "Ground Water Monitoring Network Design Using Multiple Criteria Decision Making and Geostatistics," *Water Resources Bulletin*, V.28, N.1, p.45-62.

Dahab, M., and W. Woldt, 1993, "Solid Waste Management: Cooperative Extension Initiative," *Journal of Professional Issues in Engineering Education and Practice*, American Society of Civil Engineering, V.119, N.4, p.396-401, New York, NY.
Dahab, M., and W. Woldt, 1994, "Strategies for Solid Waste Prevention in Rural Areas," *The Environmental Professional*, V.16, p.49-56.

Dou, C., Woldt, W., Dahab, M. and I. Bogardi, 1995, "Steady-state Groundwater Flow Simulation with Imprecise Parameters," UNL Agricultural Research Division Journal Series No. 10804, *Water Resources Research*, V.31, N.11, p.2709-2719.

Hagemeister, M., Jones, D., and W. Woldt, 1996, "Hazard Ranking of Landfills Using Fuzzy Composite Programming," UNL Agricultural Research Division Journal Series

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No. 10564, *Journal of Environmental Engineering*, American Society of Civil Engineering, V.122, N.4, p.248-258, New York, NY.

Goderya, F., Dahab, M., Woldt, W., and I. Bogardi, 1996, "Incorporation of Spatial Variability in Modeling Non-point Groundwater Nitrate Pollution," *Water Science and Technology*, Journal of the International Association on Water Quality, V.33, N.4-5, p.233-240.

Woldt, W., Dahab, M., Bogardi, I., and C. Dou, 1996, "Management of Diffuse Pollution in Groundwater Under Imprecise Conditions using Fuzzy Models," *Water Science and Technology*, Journal of the International Association on Water Quality, V.33, N.4-5, p.249-257.

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Woldt, W., 1998, "Packaged Pollution Prevention Educational Program," PETE Midwest Regional Conference, Kansas City, MO, January 30-31.

Budny, M., Woldt, W., and J. Stansbury, 1998, "Pollution Prevention with Public Schools," Great Plains Waste Management Conference, Omaha, NE, March.

Marahatta, R., and W. Woldt, 2001, "Modeling of Carbon Tetrachloride in Groundwater Near a Small Town Water Supply," poster presentation at the Great Plains Waste Management Conference, Omaha, NE, March.

Fisher, J., Dvorak, B., W. Woldt, 2001, "Assessment of Viral Contamination in Nebraska's Small Community Wells," poster presentation at the Great Plains Waste Management Conference, Omaha, NE, March.

Woldt, W., and B. Dvorak, 2001, "Pollution Prevention and Soft Computing," presentation to Nebraska Industrial Council on Environment meeting, Lincoln, NE, September.

Woldt, W., and B. Dvorak, 2002, "A Primer on Pathogens in Groundwater," Environmental Water Well Seminar sponsored by the Nebraska Well Drillers Association, Kearney, NE, October 15-16.

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Woldt, W., 2002, "Environmental Risks of Improperly Installed On-site Wastewater Treatment Systems," Second Annual Conference of the Nebraska On-Site Waste Water Association, Lincoln, NE, February 13-14.

Woldt, W., 2002, "On-site Wastewater Treatment: Commercial Enterprises," invited session presented at seminar series coordinated by Groundwater Foundation at Lake McConaughy, August 5-6.

Woldt, W., 2002, "Status of On-site Wastewater Treatment in Nebraska," invited presentation as part of Legislative Hearing on proposed licensure of contractors, sponsored by Senator Shrock, Omaha, NE, August 23.

Woldt, W., 2002, "Groundwater Modeling," presented to Nebraska Wellhead Protection Network, a coalition of agencies and organizations that are involved in promoting community wellhead protection, Lincoln, NE, November 13.

Woldt, W., and B. Dvorak, 2003, "A Primer on Pathogens in Groundwater, Natural Resource District Annual Water Conference," sponsored by the Natural Resource Districts, Kearney, NE, March 4.

Woldt, W., 2003, "Environmental Risks of Improperly Installed On-site Wastewater Treatment Systems," presented at each of the six on-site workshops to two different target audiences in Nebraska: North Platte, November, 5; Lincoln, November 8; Kearney, February 25; Kearney, September 11; Lincoln, September 16; Scottsbluff, September 18.

Woldt, W., 2003, "Alternative On-site Wastewater Treatment Systems," invited session presented at Region IV National Environmental Health Association Conference, Omaha, NE, September 30 and October 1.

Skipton, S., Hygnstrom, J., and W. Woldt, 2003, "New On-site Educational Resources for Nebraska," presentation delivered at Third Annual Conference of the Nebraska On-site Waste Water Association, Lincoln, NE, February 12-13.

Woldt, W., 2004, "Modes of Failure for On-site Systems," presentation delivered at 4th Annual Conference of the Nebraska On-site Waste Water Association, Lincoln, NE, February 11-12.

Woldt, W., 2004, "On-Site Wastewater Treatment for Wineries," invited session presented at Nebraska Winery and Grape Growers Association Conference, Kearney, NE, March 5-6.

Woldt, W., 2004, "Rural Water and Environment Infrastructure," Departmental VIP Tour, Lincoln, NE, March 18.

Woldt, W., 2004, "Constructed Wetlands for On-site Wastewater Treatment Systems," presented for Watershed Initiatives stakeholders at Rogers Farm, July 23.

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Woldt, W., and M. Dahab, 2004, "Adaptive Infrastructure Management for Community Water Infrastructure," poster presentation at Nebraska Well Drillers Association annual conference, Kearney, NE, October 19.

Woldt, W., 2005, "Water Security and Sustainable Communities Through Adaptive Infrastructure Management," invited presentation for Joint National Science Foundation and Great Plains Cyberinfrastructure Grid Computing Workshop, Lawrence, KS, February, 25.

Woldt, W., 2005, "Groundwater Hydraulics and Modeling," invited presentation for Western Nebraska Water Resources Workshop, Bridgeport, NE, February 28.

Woldt, W., 2005, "The Electronic Nose" invited presentation for 8th Annual Nebraska Winery and Grape Grower Association Conference, Kearney, NE, March 5.

Ginige, K., and W. Woldt, 2005, "Protection of Community Water Supply in Agricultural Watershed" invited presentation for Nebraska Water Environment Association Great Plains Waste Management Conference, Omaha, NE, April 13.

Adekoya, T., Harper, J., and W. Woldt, 2005, "Electronic Nose Technology for Winery Applications," UCARE University of Nebraska Undergraduate Research Fair, Lincoln, NE, April 18.

Woldt, W. M. Dahab, 2006, "Adaptive Infrastructure Management for Community Water Resources," invited poster presentation at Grand Challenges for Modeling in Environmental Observatories Workshop, National Science Foundation, Tucson, AZ, May 15-18.

Woldt, W. M. Dahab, 2006, "Adaptive Infrastructure Management for Environmental and Water Resources: A Conceptual Approach," poster presentation at UNL Water Center Colloquium, Lincoln, NE, October 27.

Woldt, W., 2006, "Research Needs and Advances in Groundwater Modeling Through High Performance Computing," invited presentation at Republican River Basin Conference, sponsored by The Groundwater Foundation, Kearney, NE, May.

Woldt, W., Marahatta, R., Schulte, D., M. Dahab, 2006, "Multi-scale Modeling of a Constructed Wetland System to Simulate Organic Matter Removal and Clogging," reviewed paper accepted for presentation at the IWA World Water Congress, Beijing, China, September 10-14.

Pun, M., Woldt, W., 2007, "Integrated Watershed Modeling of Frenchman Basin in a High Performance Computing Framework," presentation at Annual Water Environment Conference, Kearney, NE, November, 8.

Wayne E. Woldt, Ph.D., P.E.

Pun, M., Woldt, W., 2007, "Modeling Surface-Groundwater Interaction in a High Performance Computing Environment," poster presentation at UNL Research Fair, April 11.

Pun, M., Woldt, W., 2007, "Modeling Surface-Groundwater Interaction in a High Performance Computing Environment," poster presentation at UNL Water Center, 2007 Water Colloquium, Lincoln, NE, October 12.

Woldt, W., Skipton, S., and J. Hygnstrom, 2007, "Advances in the Onsite Wastewater Industry in Nebraska through Research and Extension," poster presentation at USDA CSREES National Water Conference, Atlanta, GA, January 30.

Shelton, D., Wilke, R., Skipton, S., Hygnstrom, J., and W. Woldt, 2007, "Demonstrating Septic System Management," poster presentation at USDA CSREES National Water Conference, Atlanta, GA, January 31.

Woldt, W., Skipton, S., and J. Hygnstrom, 2007, "Advances in the Onsite Wastewater Industry in Nebraska through Research and Extension," poster presentation at UNL Water Center, 2007 Water Colloquium, Lincoln, NE, October 12.

Shelton, D., Wilke, R., Skipton, S., Hygnstrom, J., and W. Woldt, 2007, "Demonstrating Septic System Management to Help Protect Water Quality," invited presentation at UNL Water Center, 2007 Water Colloquium, Lincoln, NE, October 12.

Woldt, W., 2009, "WATERS Network: Bringing Big Science to Water," invited presentation at DNR and UNL Water Center Brown Bag, Lincoln, NE, March 11.

Woldt, W., 2009, "WATERS Network: Can Big Science Contribute to Understanding the Water Environment," invited presentation at University of Colorado Environmental and Water Resources Seminar Series, Boulder, CO, October 21.

Woldt, W., 2009, "WATERS Network: Bringing Big Science to Water," invited presentation at Fall 2009 meeting of the Republican River Restoration Partnership, Oberlin, KS, October 22.

Woldt, W., 2010, "The WATER Machine: Heartland Water Quality Conference," presentation for the regional Food Production and Natural Resource Systems, Nebraska City, NE, June 9.

Woldt, W., 2010, "The WATER Machine: Nebraska Association of Resource Districts Conference," presentation for the state Food Production and Natural Resource Systems, Kearney, NE, September 27.

Woldt, W., 2010, "The WATER Machine: Platte River Symposium," presentation for the state Food Production and Natural Resource Systems, Lincoln, NE, October 7.

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Woldt, W., 2010, “The WATER Machine: Lower Platte River Corridor Alliance,” presentation for the district Community and Residential Environment, Mahoney State Park, Ashland, NE, October 21.

Woldt, W., 2010, “Geothermal Energy in Nebraska,” invited presentation for the UNL class ENSC 300 Energy Seminar, Lincoln, NE, October 20.

Woldt, W., 2011, “WATER: Physics, Metaphysics, and Vulnerability”, invited presentation delivered as part of the E.N. Thompson Forum on World Issues - Water and Global Security, Lincoln, NE, Oct 25. Wayne Woldt.

Woldt, W., 2011, “Risk of Groundwater Contamination from TransCanada XL Pipeline: State of Knowledge”, research-based testimony presented to Natural Resources Committee of the Nebraska State Legislature, Lincoln, NE, Nov 7. Wayne Woldt.

Moore, D., and Woldt, W., 2011, “Hydroinformatics: Data Integration in Hydrologic Information Systems for Analysis, Visualization, and Modeling in a Multi-State Watershed”, poster presentation at Robert B. Daugherty Water for Food Institute Annual Conference, Lincoln, NE, May 2.

Moore, D., and Woldt, W., 2011, “Hydroinformatics: Multi-State Watershed Analysis using Hydrologic Information Systems for Visualization, and Modeling”, poster presentation at the Great Plains Waste Management Conference, La Vista, NE, April 14..

Woldt, W., 2011, “Review and Considerations of Risk Management for TransCanada XL Pipeline”, research-based testimony presented to Natural Resources Committee of the Nebraska State Legislature, Lincoln, NE, Feb 9.

Moore, D., and Woldt, W., 2011, ”Hydrologic Information Systems for Analysis, Visualization, and Modeling in a Multi-State Watershed”, poster presented at UNL Research Fair - Graduate Student Research, Lincoln, NE; April 13.

Woldt, W., 2011, “Potential Implications for Groundwater from a Large Diameter Crude Oil Pipeline”, research-based testimony presented to Natural Resources Committee of the Nebraska State Legislature, Lincoln, NE, Dec 1.

Woldt, W., 2012, “What Will Happen if There is a Release from the Pipeline?”, invited presentation at Big Ten Government Relations Conference, University of Nebraska, Lincoln, NE, October 10.

Woldt, W., 2012, “Geothermal Energy from Groundwater and Ground Source Heat Pumps”, invited presentation at Brown Bag Seminar, Nebraska Department of Environmental Quality, Lincoln, NE, April 18.

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Woldt, W., 2012, "WATER: Physics, Metaphysics, and Vulnerability", invited presentation at Environmental and Water Resources Engineering Seminar, University of Nebraska Environmental Engineering Program, Lincoln, NE, January 27.

Woldt, W., Meyer, G., Franti, T., Li, X., Martin, D., Y. Li, 2012, "Adaptive Infrastructure Management: Sustainable Development of Rural Community Water Systems" invited presentation at Rural Futures Conference, University of Nebraska, Lincoln, NE, May 8-10.

Corr, A., W. Woldt, 2012, "The Water Machine - A Mobile Water Resource Educational System", reviewed paper accepted for presentation at the Land Grant and Sea Grant National Water Conference, published in proceedings, Portland, OR, May 22.

Hedrick, M., Woldt, W., Meyer, G. E., Smith, J. (2014). Flight Testing and Application of Unmanned Aircraft Systems for Improved Crop Management. Lincoln, NE: 2014 Program: Undergraduate Research Conference. University of Nebraska-Lincoln. **Status:** Published *Primary association:* Research/ARD

Woldt, W. (Presenter & Author), Frew, E. (Author Only), Meyer, G. E., Stachura, M. (Author Only), Mack, J. (Author Only), American Society of Agricultural and Biological Engineers Annual 2014 International Conference, American Society of Agricultural and Biological Engineers, Montreal, Canada, "Performance of Autonomous Navigation System in a Fixed Wing Unmanned Aircraft System Flying Production Agriculture Missions", Research/Creative Activity, Conference, International, peer-reviewed/refereed, published in proceedings, Accepted. (July 14, 2014).

Woldt, W., Eureka, Nebraska Extension, Lincoln, NE, "NU-AIRE: Nebraska Unmanned Aircraft Innovation, Research and Education", Research/Creative Activity, Conference, State, Accepted. (March 2014).

Woldt, W., NATA Annual Conference, Nebraska Aviation Trades Association, Kearney, NE, "NU-AIRE: Nebraska Unmanned Aircraft Innovation, Research and Education", Research/Creative Activity, Conference, State, Invited. (February 2014).

Woldt, W., NeATA Annual Conference, Nebraska Agriculture Trades Association, Kearney, NE, "NU-AIRE: Nebraska Unmanned Aircraft Innovation, Research and Education", Research/Creative Activity, Conference, State, Invited. (February 2014).

Woldt, W., UNL Water Center Retreat, UNL Water Center, Kearney, NE, "NU-AIRE Laboratory: Focusing on Unmanned Aircraft in Agriculture", Research/Creative Activity, State, Accepted. (October 2015).

Woldt, W., National eXtension Workshop, eXtension, Indianapolis, IN, "Unmanned

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Aircraft in Agriculture Learning Network”, Extension, Workshop, National, Invited. (September 2015).

Woldt, W., UAS Summit and Expo, Red River Valley, Grand Forks, ND, “Research and Education: Essential Ingredients in Commercialization of UAVs”, Extension, Conference, National, published in proceedings, Invited. (September 2015).

Woldt, W., Nebraska GIS/LIS Symposium, Nebraska GIS/LIS Consortium, Omaha, NE, “Unmanned Aircraft Systems in Land Management”, Research/Creative Activity, Conference, Regional, peer-reviewed/refereed, published in proceedings, Accepted. (April 2015).

Woldt, W., Nebraska Agricultural Technology Association Annual Conference, Nebraska Agricultural Technology Association, Grand Island, NE, “Conducting Unmanned Aircraft System Flight Operations under FAA Regulations”, Research/Creative Activity, Conference, State, Accepted. (February 2015).

Woldt, W., Nebraska Agricultural Trades Association Annual Conference, Nebraska Agricultural Trades Association, Grand Island, NE, “Unmanned Aircraft in Agriculture: Flight Operations and Education”, Research/Creative Activity, Conference, State, Invited. (February 2015).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), National Agricultural Aviation Association 2016 Annual Convention, National Agricultural Aviation Association, Long Beach, CA, "Development and Testing of an Unmanned Aircraft Safety Beacon for Aerial Application Safety", Research/Creative Activity, Conference, National, peer-reviewed/refereed, published in proceedings, Invited. (December 2016).

Primary association: Research/ARD; *Science Literacy Emphasis:* No

Woldt, W. (Presenter & Author), Smith, J. (Author Only), Colorado Agricultural Aviation Association 2016 Conference, Colorado Agricultural Aviation Association, Loveland, CO, "Development and Testing of an Unmanned Aircraft Safety Beacon for Aerial Application Safety", Research/Creative Activity, Conference, State, Invited. (November 2016).

Chavez, J. (Presenter & Author), Zhang, J. Y. (Author Only), Zhang, H. (Author Only), Woldt, W. (Author Only), 2016 USCID Ninth International Conference on Irrigation and Drainage, United States Committee on Irrigation and Drainage, Fort Collins, CO, "Issues Encountered Operating an UAS for Crop ET Estimation", Research/Creative Activity, Conference, National, Accepted. (October 2016).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), Kansas Agricultural Aviation Association 2016 Conference, Kansas Agricultural Aviation Association, Wichita, KS, "Research on Improving the Safety of Low Flying Aircraft near Unmanned Aircraft", Research/Creative Activity, Conference, State, Invited. (October 2016).

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Woldt, W. (Presenter & Author), Neale, C. (Author Only), John Deere Research Conversation, University of Nebraska, Lincoln, NE, "Unmanned Aircraft: Field Scale Research for Production Agriculture", Research/Creative Activity, Workshop, State, Invited. (August 2016).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), North Central Regional Integrated Pest Management 2016 Conference, North Central Region IPM, Manhattan, KS, "Unmanned Aircraft Systems: Technologies for Pesticide Application Management", Research/Creative Activity, Conference, Regional, Invited. (August 2016).

Woldt, W. (Presenter & Author), Neale, C. (Author Only), Remote Sensing and Spatial Analysis for Agricultural Productivity and Sustainability, University of Nebraska, Omaha, NE, "Converting Data into Actionable Information that can be Integrated into Agricultural Operations and Crop Management", Research/Creative Activity, Workshop, State, Invited. (July 2016).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), Nebraska Aviation Trades Association 2016 Annual Convention, National Aviation Trades Association, Kearney, NE, "Unmanned Aircraft Research and Education with an Emphasis on Improving the Safety for Low Flying Aircraft", Research/Creative Activity, Conference, State, Invited. (February 2016).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), Soaring Society of America 2016 Annual Convention, Soaring Society of America, Greenville, SC, "Improving the Safety of Low Flying Aircraft in the Vicinity of Unmanned Aircraft Systems", Research/Creative Activity, Conference, National, peer-reviewed/refereed, published in proceedings, Accepted. (February 2016).

Woldt, W. (Presenter & Author), Smith, J. (Author Only), Tri-State Agricultural Aviation Association 2016 Conference, Tri-State Agricultural Aviation Association, Sioux Falls, SD, "Unmanned Aircraft Research and Development: An Emphasis on Improving the Safety of Low Flying Aircraft", Research/Creative Activity, Conference, National, published in proceedings, Invited. (February 2016).

Abstracts and Reports:

Woldt, W., Stansbury, J., Bogardi, I., and A. Bleed, 1988, "Integrating GIS Technology into a Decision Support System Used to Evaluate Potential Ground Water Transfer Schemes," *GIS Symposium on Integrating Technology and Geoscience Applications*, Denver, CO, p. 17-18, September.

Woldt, W., Rajurkar, K., and I. Bogardi, 1989, "Evaluation of Sampling Frequency for Groundwater Contamination Network Design," *NATO Advanced Study Institute Stochastic Hydrology and Its Use in Water Resources Systems Simulation and Optimization*, Peniscola, Spain, September.

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Woldt, W., Stansbury, J., Bogardi, I., and W. Kelly, 1988, "Trade-Off Between Socio-Economics and Ecology for Ground Water Transfer," *EOS*, American Geophysical Union, V.69, N.44, p. 1175.

Woldt, W., and I. Bogardi, 1990, "Monitoring Network Design Using Geostatistics and Multi-Criterion Decision Making," *EOS*, American Geophysical Union, V.71, N. 43, p. 1312.

Budny, M., Rasmussen, C., Woldt, W., and J. Stansbury, 1999, "Pollution Prevention Opportunity Assessment for the Omaha Public School District," final project report, 237 pages plus 11 appendices.

Yoder, R., Hammerschmidt, B., Rooney, P., Martin, R., J. Hygnstrom, 1999, "Pollution Prevention Network: Statewide Strategy," review author for final project report, 23 pages plus 5 appendices.

de Mol, R. and W. Woldt, 2000, "Application of Fuzzy Logic in Automated Cow Status Monitoring," In: Chapter 6: Automated Detection of Oestrus and Mastitis in Dairy Cows, PhD thesis, Wageningen University, Wageningen, The Netherlands, 177 pp.

de Mol, R., and W. Woldt, 2000, "Application of Fuzzy Logic in Automated Cow Status Monitoring," (Ed. J. van Arendonk), paper no. M2.10, *51st Annual Meeting of the European Association for Animal Production*, The Hague, The Netherlands, Wageningen Pers, Wageningen, p. 180, August 21-24.

Woldt, W., Ginige, K., Kranz, W., Shapiro, C., D. Martin, 2006, "Groundwater Modeling Across a Watershed to Protect Water Supply," *Midwest Groundwater Conference*, Lincoln, NE, November 6-8.

Pun, M., Woldt, W., Chen, X.H., Samal, A., Eisenhauer, D., and Yeh, G., 2007, "Integrated Watershed Modeling for Surface-Groundwater Interaction in a High Performance Computing Framework," proceedings of *Groundwater Expo and Annual Conference*, National Ground Water Association, Orlando, FL, December 4-7.

Woldt, W., Herpel, R., Corr, A., and S. Skipton, 2010, "The WATER Machine: A demonstration model for water and energy," proceedings *Renewable Energy: Building a Sustainable Future for Nebraska*, Lincoln, NE, October 5, pg 16.

Woldt, W., Jacobs, G., Burbach, L., Schaphorst, K., and D. Rau, 2010, "Geothermal Energy in Nebraska," proceedings *Renewable Energy: Building a Sustainable Future for Nebraska*, Lincoln, NE, October 5, pg 30.

Woldt, W., Herpel, R., Corr, A., and S. Skipton, S., 2010, "The WATER Machine: An Educational System for the Greater Platte River Basins," proceedings *Greater Platte River Basins Symposium*, Lincoln, NE, October 7, pg 28.

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Woldt, W., Herpel, R., Corr, A., Skipton, S., and K. Feehan, 2010, “The WATER Machine: Engagement of Stakeholders in Water Education,” proceedings *Water For Food International Conference*, Lincoln, NE, May 2-5.

Moore, D., and W. Woldt, 2011, “Hydroinformatics: Data Integration in Hydrologic Information Systems for Analysis, Visualization, and Modeling in a Multi-State Watershed”, poster presentation at Robert B. Daugherty Water for Food Institute Annual Conference, Lincoln, NE, May 2.

Moore, D., and W. Woldt, 2011, “Hydroinformatics: Multi-State Watershed Analysis using Hydrologic Information Systems for Visualization, and Modeling”, poster presentation at the Great Plains Waste Management Conference, LaVista, NE, April 14.

Woldt, W., 2012., “Technical Review for Nebraska Legislature”, response to Senator request for report review. University of Nebraska, Lincoln, NE, pp. 2.

Teaching:

Successful delivery of BSEN/CIVE 458/858 - Groundwater Engineering, Spring 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011 and 2012. The course has been taught in a distance education mode with sites in Lincoln and Omaha. Web-based tools (Blackboard Course Info) were used extensively to facilitate class delivery and communication.

Served as advisor for Senior Design team with focus on Geothermal Energy, Fall 2011 and Spring 2012.

Served as advisor for Timothy Kinoshita Senior/Honors Thesis, “Introduction to Unmanned Aerial Systems Theory and Operations for Agricultural and Natural Resources”, Biological Systems Engineering Major in Engineering. This work provides a foundation for the development of a new course in unmanned aircraft systems at UNL. Completed December 2012.

Successful delivery of WATS 281 – Introduction to Water Science, Fall 2008. This course was co-taught with Dr. Harvey.

Successful delivery of BSEN/CIVE 498/496/898/896 - GIS in Water Resources, Fall 2006, This course was taught as a resident GIS course using distance education technology that linked the University of Texas (Dr. David Maidment), Utah State University (Dr. David Tarboton) and University of Nebraska (Drs. Wayne Woldt and Ayse Irmak). Dr. Woldt was responsible for coordination of the course, and delivery of 50% of the course at UNL.

Successful delivery of CE 498 - Pollution Prevention: Principles and Practices, every Summer 1997 through 2007. The course was taught in a highly interactive, field based

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learning style in which students completed an internship as part of the class. Transition from active teaching role to supervision of P3 interns on special projects.

Successful delivery of BSEN 998 - Fuzzy Systems with Engineering Applications. This course was team taught for the first time in Fall 2001 with a repeat in Fall 2002. The team of instructors also included Dr. David Jones and Dr. George Meyer.

Successful delivery of BSEN 496/896 -Spatial Information Systems in Engineering, Spring 2003. This course was taught for the first time with Dr. Aemal Khattak in Civil Engineering. We utilized a highly interactive, laboratory based learning style in which students worked on workstations during class with Woldt reporting 50% contribution.

Successful delivery of BSEN 896 - Special Topics: Groundwater Modeling, Fall 2003.

Successful delivery of BSEN 996 - Special Topics: Wavelet Theory and Applications, Summer 2004.

Successful delivery of CE 424/824 - Solid Waste Management Engineering, Fall 2004. Co-taught course with Dr. Mohamed Dahab (33% contribution).

Extension Publications:

Educational Programs:

Woldt, W., Dahab, M., and J. Hygnstrom, 1997, *Pollution Prevention Educational Program for Business and Industry*, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This publication represents a significant contribution to the educational resources that are available for business and industry to learn about pollution prevention. It is a packaged educational program that consists of ten different modules that are structured to begin with an introduction to pollution prevention, transition to pollution prevention methods, and end with implementation of pollution prevention. Users of the materials have maximum flexibility in terms of presentation time since each module is designed for 20, 40, or 60-minute presentations. In addition, presentation of the educational program is designed for use with computer-based multimedia methods. The computer-based multimedia component is a unique element of the educational program since it combines the images available from the slide/overhead resource library with motion, sound, and video clips (often termed Quicktime clips).

Woldt, W., Dahab, M., Grisso, R., and S. Niemeyer, 1997, *Pollution Prevention: Overview (Unit I)*, EC 97-451-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This publication is the first unit in a four unit educational program focused on pollution prevention for farms, acreages and homes. The first unit focuses on introducing participants to the concept of pollution prevention, risk, and decision making. Development of the packaged educational program is completed, with a regional distribution and a satellite-based introduction of the program to states within EPA Regions VII and VIII also completed.

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Woldt, W., Grisso, R., Niemeyer, S., and M. Dahab, 1997, *Pollution Prevention on Acreages (Unit III)*, EC 97-451-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This publication is the third unit in a four unit educational program focused on pollution prevention on farms, acreages and homes. The third unit focuses on the unique challenges of acreage owners with regard to environmental issues and helps them understand the benefits of pollution prevention in addressing those challenges.

Hay, D., Woldt, W., Grisso, R., and R. Koelsch, 1997, *Overall Assessment (Unit 1 of Farm-A-Syst)*, EC 98-747-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This is the first unit in the Farm-A-Syst package that was adapted for use in Nebraska. Development of the materials is complete.

Hay, D., Woldt, W., Grisso, R., and R. Koelsch, 1997, *Site Evaluation (Unit 2 of Farm-A-Syst)*, EC 98-748-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This is the second unit in the Farm-A-Syst package that was adapted for use in Nebraska. Development of the materials is complete.

Woldt, W., Hay, D., Grisso, R., and R. Koelsch, 1997, *Household Wastewater Treatment (Unit 7 of Farm-A-Syst)*, EC 8-772-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This is the seventh unit in the Farm-A-Syst package that was adapted for use in Nebraska. Development of the materials is complete.

Woldt, W., Hay, D., Grisso, R., and R. Koelsch, 1997, *Hazardous Materials and Waste Management (Unit 8 of Farm-A-Syst)*, EC 98-754-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources. This is the eighth unit in the Farm-A-Syst package that was adapted for use in Nebraska. Development of the materials is complete.

Woldt, W., 2002, assume leadership in management of the *Sand Tank Groundwater Flow Model* and educational materials developed to accompany the models manufactured at the Biological Systems Engineering Research Shop of the University of Nebraska-Lincoln. There are three versions of the models: Standard, Karst, and Septic. The model is an excellent teaching tool used to demonstrate important concepts of how ground water and contaminants flow through soil and rock materials. The user's manual, *Sand Tank Groundwater Flow Model Manual*, has been revised to include discussion of contaminant transport and color images of the model. The manual is also included on CD and is packaged with the model. Future revisions will include instructions to use the Septic model. The Sand Tank Groundwater Flow Model web site is in the process of being updated, and the capability of taking credit card orders for the models was accomplished.

Hygnstrom, J., Skipton, S., Woldt, W., 2005, *Nebraska Onsite Wastewater Treatment Practitioner's Manual*, curriculum for onsite wastewater treatment professionals certification exams.

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Woldt, W., 2012, “Mound Systems”, Mound System Endorsement - Study Guide. University of Nebraska, Lincoln, NE, pp. 101.

Woldt, W., 2012, “Rules and Regulations for the Design, Operation and Maintenance of Onsite Wastewater Treatment Systems”, Title 124 Regulations - Study Guide. University of Nebraska, Lincoln, NE, pp. 81.

Woldt, W., Corr, A. (2014). Introduction to Unmanned Aircraft Systems: A Curriculum. (pp. 42). Lincoln, NE: Introduction to Unmanned Aircraft Systems. Dept of Biological Systems Engineering, Nebraska Extension. **Status:** Published
Primary association: Extension

Woldt, W., Pekarek, K. (2014). Watersheds, Water Wells and Wastewater: A Curriculum. (pp. 73). Lincoln, NE: Watersheds, Water Wells and Wastewater. Dept. of Biological Systems Engineering, Nebraska Extension. **Status:** Published
Primary association: Extension

Woldt, W., (2015). eXtension: Unmanned Aircraft Systems in Agriculture National Learning Network. **Type of work:** Educational program, Social media, Web resource, Webinar series. National eXtension educational learning network on Unmanned Aircraft in Agriculture in collaboration with Purdue University, University of Arkansas, Oregon State University, and Utah State University. Serve in leadership role. **Status:** Implemented

Woldt, W., (2015). “Onsite Wastewater Treatment: Planning and Design of Systems.” A new Nebraska Extension education program for the onsite industry providing a virtual design experience in which participants design their own wastewater treatment system for a given site. Different sites were used for each training location. **Type of work:** Curriculum, Educational program. **Status:** Implemented

Woldt, W., Pekarek, K. (2015). “Onsite Wastewater Treatment: Vulnerable Landscapes.” A new Nebraska Extension education program for the onsite industry designed to convey the concept of landscapes that are vulnerable to water pollution, and steps that can be taken to protect these natural resources. **Type of work:** Curriculum, Educational program. **Status:** Implemented

Woldt, W., (2015). “Unmanned Aircraft for Livestock Emergency Response.” Unmanned aircraft systems overview and a focus on use of unmanned aircraft systems for prevention and response to livestock disease outbreak. **Type of work:** Educational program. **Status:** Implemented

Woldt, W., (2015). “Unmanned Aircraft Systems in Agriculture: Integrated Pest Management.” Video recorded for use in Nebraska Integrated Pest Management workshops focused on an introduction to unmanned aircraft systems, emerging rules, and safety considerations for aerial applicators. **Type of work:** Educational program. **Status:** Implemented

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2016 Extension Workshop series: Introduction to Unmanned Aircraft Systems:
Products used for the delivery: Newly developed curricula entitled "Introduction to Unmanned Aircraft Systems", coauthored by Wayne Woldt, William Kreuser, and Jacob Smith. *Nature of Engagement:* Educational program, Media outputs (newspaper, radio, television, etc), Presentation. *Accomplishments and Impact:* Evaluation of attendees indicates that the training was well received with 100% responding that the workshop was helpful with comments such as: "very helpful", "it was great", "awesome, timely, great introduction", and "great class, thank you".

2016 Extension Workshop Series: Soils as a Wastewater Treatment System
Products used for the delivery: Newly developed curricula entitled "Soil as a Wastewater Treatment System", coauthored and presented by Wayne Woldt, Katie Pekarek and Mark Bauer. *Nature of Engagement:* Educational program, Presentation. *Accomplishments and Impact:* Collaborated with a team on development of original curriculum (6 hours of content), and delivery of 6 workshops across Nebraska to advance the onsite wastewater industry. A total of 153 industry attendees with survey results indicating that 89% of respondents either strongly agreed or agreed that they were more knowledgeable about soils and their role in wastewater treatment. 86% indicate that they are more aware of the importance of percolation tests, and how to use Title 124 for help. From a long-term perspective, 82% indicated that the training was helpful to them as a professional and intend to follow the procedures spelled out in the regulations to protect water quality.

Extension Circulars:

Woldt, W., Dahab, M., and J. Hygnstrom, 1995, "Pollution Prevention Toolkit for Farm Cooperatives," EC 95-739-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., Dahab, M., and J. Hygnstrom, 1995, "Pollution Prevention Toolkit for Metal Finishers," EC 95-740-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., Dahab, M., and J. Hygnstrom, 1995, "Pollution Prevention Toolkit for Drycleaners," EC 95-741-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., Dahab, M., and J. Hygnstrom, 1995, "Pollution Prevention Toolkit for Vehicle Maintenance Shops," EC 95-742-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., Dahab, M., and J. Hygnstrom, 1995, "Pollution Prevention Toolkit for Autobody Repair Shops," EC 95-743-S, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Wayne E. Woldt, Ph.D., P.E.

Hygnstrom, J., Woldt, W., S. Skipton, 2001, "Residential On-site Wastewater Treatment, An overview," EC 01-798, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

NebGuides:

Hygnstrom, J., Skipton, S., and W. Woldt, 2001, "Residential On-Site Wastewater Treatment: Septic System and Drainfield Maintenance," G1424, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2001, "Residential On-Site Wastewater Treatment: Lagoon Maintenance," G1423, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Woldt, W., and B. Dvorak, 2002, "Decommissioning Water Wells: An Owners Guide," G1471, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Site Evaluation," G1469, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Constructed Wetlands," G1474, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Mound Systems," G1475, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Gravelless Drainfield Systems for Effluent Treatment," G1480, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Traditional Drainfield Systems for Effluent Treatment," G1479, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Conducting a Soil Percolation Test," G1472, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: Septic Tank Design and Installation," G1473, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Wayne E. Woldt, Ph.D., P.E.

Hygnstrom, J., Skipton, S., and W. Woldt, 2002, "Residential On-site Wastewater Treatment: The Role of Soil," G1468, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., Pamperl, A., Woldt, W., and P. Denning, 2005, "Drinking Water: Uranium," G1569, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., W. Woldt, 2005, "Drinking Water: Testing for Water Quality," G907, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., W. Woldt, 2005, "An Introduction to Drinking Water," G1539, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., W. Woldt, 2005, "Residential On-site Wastewater Treatment: Septic Tank and Drainfield Maintenance," G1424, revised, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., W. Woldt, 2006, "Residential Onsite Wastewater Treatment: Site Evaluation," G1469, revised, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., W. Woldt, 2006, "Residential Onsite Wastewater Treatment: Conducting a Percolation Test," G1472, revised, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., W. Woldt, 2006, "Residential Onsite Wastewater Treatment: The Role of Soil," G1468, revised, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., W. Woldt, 2006, "Drinking Water: Approved Water Testing Laboratories in Nebraska," G1614, revised, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., Woldt, W., A. Kahl, 2006, "Drinking Water: Arsenic," G1552, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., Woldt, W., and S. Drda, 2006, "Drinking Water: Lead," G1333, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., and W. Woldt, 2009. "Drinking Water: Testing for Quality," G907, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-

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Lincoln.

Skipton, S., Dvorak, B., W. Woldt, 2010, “An Introduction to Drinking Water,” G1539, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., W. Woldt, 2010, “Residential On-site Wastewater Treatment: Septic Tank and Drainfield Maintenance,” G1424, revised, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2010, “Residential On-Site Wastewater Treatment: Lagoon Maintenance,” G1423, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., and W. Woldt, 2010. “Drinking Water: Sulfur (Sulfate and Hydrogen Sulfide),” G1275, Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: Hazardous Materials and Waste Management” G2053. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: Pesticide and Fertilizer Storage and Handling” G2054. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: Runoff Management” G2052. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: An Introduction” G2049. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: Water Well Construction, Condition, and Management” G2050. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “Private Drinking Water Supplies: Household Wastewater (Sewage) Treatment System Management” G2051. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., and W. Woldt, 2011, “An Introduction to Drinking Water,” G1539. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Wayne E. Woldt, Ph.D., P.E.

Woldt, W., and Corr, A., 2011, “The WATER Machine: Scratch Card Evaluation”, cards for evaluation of The WATER Machine educational programs. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Skipton, S., and W. Woldt, 2011, “Lagoon & Septic Systems Made Easy for Homeowners”, web site for onsite system education. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., and W. Woldt, 2011, “UNL Water: Domestic Sewage”, web site for onsite system education. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., W. Woldt, 2012, “Private Drinking Water Wells: Operation and Maintenance for a Safe Well”, G2154. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Woldt, W., Skipton, S., 2012, “Private Drinking Water Wells: The Distribution System”, G2152. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Hygnstrom, J., Woldt, W., Skipton, S., 2012, “Private Drinking Water Wells: Operation and Maintenance for Mechanical Components”, G2153. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., W. Woldt, 2012, “Private Drinking Water Wells: Planning for Water Use”, G2149. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Hygnstrom, J., W. Woldt, 2012, “Private Drinking Water Wells: The Water Well”, G2151. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Kranz, W., Hygnstrom, J., W. Woldt, 2012, “Private Drinking Water Wells: Water Sources” G2150. Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., Skipton, S. (2014). Residential Onsite Wastewater Treatment: Mound Systems. (pp. 4). Lincoln, NE: Residential Onsite Wastewater Treatment: Mound Systems. University of Nebraska-Lincoln. **Status:** Published
Primary association: Extension

Dvorak, B., Skipton, S., Woldt, W., Kahle, A. (2014). Drinking Water: Arsenic. Lincoln, NE: University of Nebraska - Lincoln, Institute of Agriculture and Natural Resources, Extension. **Status:** Published
Primary association: Extension

Wayne E. Woldt, Ph.D., P.E.

Dvorak, B., Skipton, S., Nelsen, J., Woldt, W. (2014). Drinking Water: Uranium. Lincoln, NE:. University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Extension.. **Status:** Published
Primary association: Extension

Skipton, S., Dvorak, B., Kahle, A., Woldt, W. (2014). Drinking Water: Fluoride. Lincoln, NE:. University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Extension.. **Status:** Published
Primary association: Extension

Dvorak, B., Skipton, S., Woldt, W. (2014). Drinking Water: Iron and Manganese. Lincoln, NE:. University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Extension. **Status:** Published
Primary association: Extension

Skipton, S., Dvorak, B., Woldt, W., Wirth, S. (2014). Drinking Water: Bacteria. . Lincoln, NE:. University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Extension. **Status:** Published
Primary association: Extension

NebFacts:

Fuller, E., and W. Woldt, 1992, "Establishing and Operating a Solid Waste Transfer Station," NF92-78, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Dahab, M., and W. Woldt, 1993, "Pollution Prevention in Business," NF93-122, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Woldt, W., and M. Dahab, 1994, "Don't Dump It: The Ban on Private Property Disposal of Solid Waste," NF94-181, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., Heiden, K., and W. Woldt, 1994, "Handling Wastes: Household Appliances (White Goods)," NF94-189, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., and W. Woldt, 1994, "Handling Wastes: Household Fluorescent Lighting and PCB Ballasts," NF94-190, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., Heiden, K., and W. Woldt, 1994, "Handling Wastes: Household Solvents," NF94-193, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

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Niemeyer, S., Heiden, K., and W. Woldt, 1994, "Handling Wastes: Household Paints and Paint Related Products," NF94-194, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., Grisso, R., W. Woldt, and K. Heiden, 1994, "Handling Wastes: Vehicle Batteries," NF94-195, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., Heiden, K., Grisso, R., and W. Woldt, 1994, "Handling Wastes: Used Oil and Antifreeze," NF94-196, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Niemeyer, S., Heiden, K., Grisso, R., and W. Woldt, 1994, "Handling Wastes: Tires," NF 94-197, Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Skipton, S., Dvorak, B., and W. Woldt, 2005, "Drinking Water: Approved Water Testing Laboratories in Nebraska," Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln.

Other Publications:

Woldt, W., and P. Gessaman, 1991, "Waste Management Priority Initiative Progress Report," Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, June.

Woldt, W., 1995, "A Non-Intrusive Landfill Hazard Ranking System," Focus on Infrastructure Research, Center for Infrastructure Research, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, V.2, N.2.

Woldt, W., 1995, "A Multi-Variate Index Methodology for Landfill Site Characterization Using Geophysics and Geostatistics," Research Briefs, Water Center/Environmental Programs, Cooperative Extension Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, V.3, N.2.

Killinger, E., Woldt, W., Bjorklund, N., Fech, J. C., Lott, D., Hammond, V., Skipton, S., Major, A. (2014). Water, Climate and Environment - Community. Lincoln, NE: Making A Difference - Impact Summary Reports. UNL Extension. www.extension.unl.edu

Woldt, W. (2014). Unmanned Aircraft in Agriculture: Implications for the Yield Gap and Air Space., Judy McDowell (Ed.), (November 2014 ed., pp. 11 -13). Lincoln, NE: The NATA Voice. Nebraska Aviation Trades Association. www.gonata.net

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Refereed Journal Article (Extension):

Dahab, M., and W. Woldt, 1993, "Solid Waste Management: Cooperative Extension Initiative," *Journal of Professional Issues in Engineering Education and Practice*, V.119, N.4, p.396-401, American Society of Civil Engineering, New York, NY.

Conference Proceedings (Extension):

Dahab, M., and W. Woldt, 1992, "Solid Waste Management: The Extension Service Initiative," proceedings *Water Forum '92 Environmental Engineering Section*, American Society of Civil Engineers, Baltimore, MD, p. 543-548, August 2-6.

Woldt, W., and B. Sandhorst, 1993, "Use of Computer Based Multimedia Systems in Composting and Solid Waste Management Education," proceedings *National Extension Compost Utilization Conference*, Minneapolis, MN, p.227-232, June 2-4.

Woldt, W., and B. Sandhorst, 1994, "Use of Computer Based Multimedia Systems in Solid Waste Management Education," proceedings *Fifth International Conference on Computers in Agriculture*, American Society of Agricultural Engineers, Orlando, FL, p.745-751, February 6-9.

Woldt, W., 1997, "Composting Livestock Manure," proceedings *Livestock and Environment Symposium* (Ed. R. Koelsch), Kearney, NE, March 26-27.

Hygnstrom, J., Woldt, W., and M. Dahab, 1997, "Pollution Prevention Education Modules," presented at *National Pollution Prevention Roundtable Conference*, Denver, CO, April 1-4.

Niemeyer, S., Woldt, W., Grisso, R. and M. Dahab, 1997, "Pollution Prevention for Farms, Acreages, and Households," presented at *National Pollution Prevention Roundtable Conference*, Denver, CO, April 1-4.

Dvorak, B., Woldt, W., Dahab, M., and D. Schulte, 1998, "Partners in Pollution Prevention Internship Program: A New Model in Hands-On Education," *33rd Annual Midwest Conference of the American Society for Engineering Education*, Salina, KS, April.

Dvorak, B., Woldt, W., Dahab, M., and D. Schulte, 1998, "Partners in Pollution Prevention Internship Program: Success Stories and Lessons Learned," proceedings *Annual Conference of the American Society for Engineering Education*, Seattle, WA, July.

Hygnstrom, J., Woldt, W., Dvorak, B., Dahab, M., and D. Schulte, 1999, "Partners in Pollution Prevention: An Innovative Educational Experience," proceedings *National Pollution Prevention Roundtable Spring Conference*, Washington, DC, April 6-9.

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Callaghan, E., Dvorak, B., W. Woldt, 2001, "Student Intern Waste Assessments: Comparison of the Prescriptive and Descriptive Pollution Prevention Methods," proceedings *2001 National Pollution Prevention Roundtable Spring Conference* (Ed. M. Russo), Chicago, IL, March.

Dvorak, B., Woldt, W., and J. Hygnstrom, 2001, "Partners in Pollution Prevention Internship Program: Employing Undergraduate Engineering Students to Provide Technical Assistance," proceedings *2001 National Pollution Prevention Roundtable Spring Conference* (Ed. M. Russo), Chicago, IL, March.

Dvorak, B., Woldt, W., Dahab, M, and D. Schulte, 2001, "Partners in Pollution Prevention Internship Program: Combining Research and Education," proceedings *2001 American Society for Engineering Education Annual Conference*, Albuquerque, NM, June.

Hygnstrom, J., Woldt, W., and S. Skipton, 2009, "Continuing to Advance the Onsite Industry in Nebraska," proceedings of *ONSITE: The Sustainable Wastewater Opportunity*, *National Onsite Wastewater Recycling Association*, Milwaukee, WI, April.

Dissertations and Theses Supervised:

Hagemeister, M. "Systems Approach to Landfill Hazard Assessment with Geophysics," Master of Science Thesis, University of Nebraska-Lincoln Libraries, co-supervised with David Jones, December, 1993.

Williams, L., "The Effects of Uncertainty in Planning Regional Integrated Solid Waste Management Systems for Rural Areas," Master of Science Thesis, University of Nebraska-Lincoln Libraries, June, 1994.

Tannehill, C., "Evaluation of Nitrate Treatment Methods Under Uncertainty," Master of Science Thesis, University of Nebraska-Lincoln Libraries, co-supervised with Mohamed Dahab, August, 1994.

Simons, B., "A Multivariate Index Methodology for Landfill Site Characterization Using Geostatistics and Geophysics," Master of Science Thesis, University of Nebraska-Lincoln Libraries, August, 1995.

Kuhn, G., "Evaluation of Risk-Based Decision Models for Prioritizing Waste Disposal Sites," Master of Science Thesis, University of Nebraska-Lincoln Libraries, co-supervised with Dennis Schulte, December, 1995.

Dou, C., "Groundwater Flow and Solute Transport Simulation with Imprecise Parameters," Doctoral Dissertation, University of Nebraska-Lincoln Libraries, co-supervised with Mohamed Dahab, December, 1995.

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Crist, D., "Development of a Life Cycle Analysis Based Decision Support Method for Industrial Pollution Prevention," Master of Science Thesis, University of Nebraska-Lincoln Libraries, May, 1996.

Bowling, S., "A Geophysical and Geostatistical Methodology for Evaluating Potential Subsurface Contamination from Feedlot Runoff Retention Ponds," Master of Science Thesis, University of Nebraska-Lincoln Libraries, December, 1996.

Rein, W., "Landfill Hazard Ranking: Integration of Three Case Studies," unpublished special topics project in partial fulfillment of Master of Science degree requirements.

Glunz, G., "Design Installation and Startup of a Constructed Wetland for On-site Wastewater Treatment," Master of Science Thesis, University of Nebraska-Lincoln Libraries, August, 1998.

Rosenhamer, G., "Dependence of Sequential Ordering on Pollution Prevention Option Implementation," Master of Science Thesis, University of Nebraska-Lincoln Libraries, August, 1998.

Budny, M., "Hazardous and Special Waste Pollution Prevention Opportunity Assessment for a Metropolitan School District," Master of Science Thesis, University of Nebraska-Lincoln Libraries, October, 1998.

Stone, M., "Water Quality Analysis of a Constructed Wetland for On-site Wastewater Treatment," Engineering Senior Honors Thesis, Department of Biological Systems Engineering, December, 1998.

Wang, Y., "Modeling the Performance of a Constructed Wetland Using Fuzzy Logic," Master of Science Thesis, University of Nebraska-Lincoln Libraries, 2001.

Fisher, J., "Evaluation and Modeling of Selected Small Community's Wells in Nebraska for Pathogen Contamination," Master of Science Thesis, University of Nebraska-Lincoln Libraries, 2001.

Callaghan, E., "Understanding the Prescriptive and Descriptive Waste Assessment Methods Using Student Interns," Master of Science Thesis, University of Nebraska-Lincoln Libraries, 2001.

Marahatta, R.C., "Multi-Scale Modeling of a Vegetated Submerged Bed System with Application in Organic Matter Removal and Clogging," Doctoral Dissertation, University of Nebraska-Lincoln Libraries, November, 2004.

Ginige, K. "Protection of Community Water Supply in an Agricultural Watershed," Master of Science Thesis, University of Nebraska-Lincoln Libraries, May, 2006.

Wayne E. Woldt, Ph.D., P.E.

Pun, M., “Implementing an Integrated Surface-Groundwater Model in Multiple Computational Environments,” Master of Science Thesis, University of Nebraska-Lincoln Libraries, December, 2008.

Arthur, G., “Modification to Constructed Wetland for Enhanced Nutrient Removal”, Master of Science, non-thesis option, Agricultural and Biological Systems Engineering,

Moore, D., “Development of a Groundwater Data Model for Republican River Basin”, Master of Science, non-thesis option, Civil Engineering.

Graduate Student Committees (completed):

Doctor of Philosophy

Chunhua Dou	Civil Engineering
Farida Goderya	Civil Engineering
David Parker	Biological Systems Engineering
Bryan Woodbury	Civil Engineering
Ram Marahatta	Civil Engineering

Master of Science

Chris Miller	Civil Engineering
Doug Simon	Civil Engineering
Sherman Reed	Mechanized System Management
Mohan Seripalli	Civil Engineering
Dinesh Setty	Civil Engineering
David Montag	Civil Engineering
John Ritterling	Civil Engineering
Carl Ham	Geology
Scott Vanier	Civil Engineering
Dan Inman	Geology
Brian Wanzenried	Civil Engineering
Michael Behrens	Civil Engineering
Carla Rasmussen	Civil Engineering
Jack Sheng	Environmental Engineering
Steve Jillson	Environmental Engineering
Brian Christ	Environmental Engineering
Yuezhang Wang	Environmental Engineering
Vikas Tandon	Geology
Erin Callaghan	Environmental Engineering
Julie Fisher	Environmental Engineering
Amanda Fox	Environmental Engineering
Doug Youngblood	Environmental Engineering
Payal Mehta	Environmental Engineering
Gevinda Ginige	Environmental Engineering
Mahesh Pun	Environmental Engineering

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Dissertations and Theses (in progress):

Graduate Student Committee Member – Ph.D.

David Mabie, Biological Engineering.

Co-Chair - Graduate Student Committee – Ph.D.

Qiao Hu, School of Natural Resources.

Co-Chair - Graduate Student Committee – M.S.

Mitch Maguire, Agricultural and Biological Systems Engineering.

Member – Graduate Student Committee – M.S.

Sandeep Bhatti, Agricultural and Biological Systems Engineering

Workshops and Short Courses (significant leadership):

1992

Waste Management: Current Issues and Future Directions (*Part I*).

Waste Management: Current Issues and Future Directions (*Part II*).

Waste Management: Current Issues and Future Directions (*Part III*).

Implementing the Extension Initiative: A Solid Waste Programming Workshop.

Risk Communication: A Workshop for Extension Educators.

Pollution Prevention and Waste Minimization in the Business and Commercial Sector.

1993

Recycling Realities - A National Video Conference.

EPA Region VII Pollution Prevention Roundtable.

Nebraska State Fair - Earthbound.

Theory and Application of Geostatistics to Environmental Investigations.

1994

Local Options for Managing Solid Waste - A Three Part National Satellite Video Conference.

Nebraska Pollution Prevention Roundtable.

Land Application of Organic Residuals.

Remediation of Contaminated Soils and Sediments.

1995

In-Situ Determination of Hydraulic Properties for Remedial Planning.

Modeling Groundwater Flow and Transport.

Design and Operation of Compost Systems.

Seminar Series on Solid Waste Management.

1996

Private Drinking Water and Wastewater.

Green and Profitable Printing.

State tour of the Mobile Outreach for Pollution Prevention (MOPP) van.

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1997

Public Water Supplies: How Do Communities and Agriculture Protect Them?
Pollution Prevention for Farms, Acreages, and Households. Nationwide satellite video conference introducing educational program.
Organize and chair composting session for the Livestock and Environment Symposium.

2000

Work with Nebraska Well Drillers Association in the delivery of six workshops in which my contribution focused on methods and techniques for environmental risk assessment. Workshops were held in the communities of Scottsbluff, North Platte, Kearney, Norfolk, Bellevue, and Lincoln with a total participation of 285 individuals (121 real estate developers and 164 well drillers). Impact evaluation results of the workshops is retained by the Association and has not been summarized.

A series of workshops were delivered in Spring 2000 to a target audience of industry and regulatory representatives with topics including: new state regulations, methods to size on-site systems, alternative systems, and proper construction procedures for on-site wastewater treatment systems. Workshops were conducted in Lincoln, North Platte, Norfolk, and Gering.

A series of workshops were delivered in Fall of 2000 to a target audience of industry and regulatory representatives with topics including: new state regulations, methods to size on-site systems, alternative systems, and proper construction procedures for on-site wastewater treatment systems. Workshops were conducted in Grand Island (December 6) and Omaha (December 13).

2001

A series of workshops were delivered in Fall 2001 to a target audience of industry and regulatory representatives with topics including: new state regulations, methods to size on-site systems, alternative systems, and proper construction procedures for on-site wastewater treatment systems. Workshops were conducted in North Platte, Grand Island, Norfolk, Omaha, Tecumseh.

2002

Develop and deliver, along with Dr. D. Jones and Dr. G. Meyer, an ASAE Continuing Education workshop on Fuzzy Systems with Engineering Applications, Chicago, IL, July 27.

Odor Measurement and Modeling, coordinated the planning and deliver of a workshop jointly sponsored by Nebraska Section ASAE, Cooperative Extension and Biological Systems Engineering, September 20.

Provided leadership to a multi-agency Task Force that planned, coordinated, and delivered the second annual conference for the on-site wastewater treatment industry. The conference was a success with one of the primary impacts being the continued development of the Nebraska Onsite Waste Water Association (NOWW A), an industry

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association to advance the professional status of contractors, consultants and regulators, February 13-14.

2003

Provided leadership in development and delivery of a series of six workshops were delivered in Fall 2002, Spring 2003, and Fall 2003 to two different target audiences (industry/regulatory representatives, and realtor professionals) with topics including: new state regulations, methods to size on-site systems, alternative systems, and proper construction procedures for on-site wastewater treatment systems. Workshops were conducted in North Platte (Nov. 5), Lincoln (Nov. 8), Kearney (Feb. 25), Kearney (Sept. 11), Lincoln (Sept. 16), and Scottsbluff (Sept. 18).

Provided leadership to a multi-agency Task Force that planned, coordinated, and delivered the third annual conference for the on-site wastewater treatment industry in Lincoln, NE. The conference was a success with one of the primary impacts being the continued evolution of the Nebraska Onsite Waste Water Association (NOWWA), an industry association to advance the professional status of contractors, consultants and regulators, Lincoln, NE, February 12-13.

Work with multi-agency, interdisciplinary team to implement and deliver 3rd Alternative Water and Wastewater Technologies for Small Communities Conference and chair session, Omaha, NE, March 31 - April 1.

A series of four focused workshops were delivered to Johnson Lake, NE, residents in response to water quality concerns in the lake. A total of 138 attendees participated in the workshops, with a majority of respondents indicating that they intend to take more aggressive steps in managing their onsite wastewater treatment systems. Initial data collected by NDEQ indicates water quality has improved, June.

2004

Initiate planning of educational programming with Lower Platte River Corridor Alliance for delivery in early spring 2004.

Provided leadership to a multi-agency Task Force that planned, coordinated, and delivered the fourth annual conference for the on-site wastewater treatment industry. The conference was a success with one of the primary impacts being the continued evolution of the Nebraska Onsite Waste Water Association (NOWWA), an industry association to advance the professional status of contractors, consultants and regulators, Lincoln, NE, February 11-12.

Work with team to develop and deliver educational programming in eight Nebraska communities located in the Lower Platte River Corridor. Program entitled "Drinking Water: Don't Take it for Granted," presented to sessions in Gretna, May 8; Cedar Creek, May 12; Papillion, May 18; Yutan, June 1; Valley, June 15; Fremont, June 16; North Bend, June 19, Schuyler, June 23.

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Primary responsibility for presenting percolation-testing materials, including class lecture and field demonstrations for a series of two focused workshops developed and delivered, in partnership with NOWWA. A total of 55 on-site industry professionals attended the “Soils Identification - Percolation Testing, Generation II,” North Platte, NE, October 12, and Wahoo, NE, October 14.

2005

Provide guidance and support to student intern, Gina Rust, as part of Partners in Pollution Prevention internship project for “Arsenic in Private Water Supply Wells”. Gina was able to visit 12 county offices with a total of 39 extension educators/ assistants/staff representatives from 14 counties present. The purpose of the presentations was to increase awareness of arsenic regulations and implications for private well owners.

Develop and present educational materials for certification training of onsite professionals. Primary responsibility to present the material to pumpers, installers and inspectors, during three consecutive days at seven locations in Nebraska. Training was provided to 47 on-site professionals in Scottsbluff, NE, July 19-21; 125 attended sessions in Grand Island, NE, August 30-September 1; 102 attended sessions in North Platte, NE, September 27-29; 110 attended sessions at Ithaca/Mead, NE, October 25-27. Three-day training will be provided in Norfolk, NE, November 15-17. In addition, one day of training will be provided for installers in Lincoln, NE, December 6, and Kearney, NE, December 8.

Develop and present introduction to “Applied Groundwater Modeling” delivered to 10 Natural Resources District personnel on March 2, at Kearney, NE.

2006

Present educational materials for certification training of onsite pumpers, installers and inspectors. Training was provided for the following: 120 on-site professionals in Norfolk, NE, November 15-17; 41 on-site professionals in Lincoln, NE, December 6; 79 on-site professionals in Kearney, NE, December 8; 44 on-site professionals in Omaha, NE, January 26; 35 on-site professionals in Lincoln, NE, February 14; 25 on-site professionals in North Platte, NE, October 4-5.

Primary responsibility for presenting technical aspects of onsite wastewater systems at the Nebraska Onsite Wastewater Association Annual Conference. A total of 43 learners attended the Alternative Technologies: Mound System workshop in Lincoln, NE, February 15.

Primary responsibility for presenting an overview of the Nebraska Onsite Wastewater Educational Program in Nebraska at the Region VII EPA Onsite Forum , A total of 79 attended the multi-state program (Kansas, Missouri, Iowa, Nebraska), Kansas City, MO, September 27.

Primary responsibility for developing most of the workshop materials, and presenting two main case studies in groundwater model development as part of a workshop entitled Introduction to Groundwater Modeling for NRDs. A total of 15 attended the workshop in

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Grand Island, NE, November 15.

Committee and Additional Activities:

International:

- Invited to chair a technical session entitled “Neural Networks Applications II” at EUFIT’97, September 9-11, 1997, Aachen, Germany.
- Invited to chair a technical session entitled “Neural Networks Algorithms” at EUFIT’98, September 7-10, 1998, Aachen, Germany.
- Invited to chair a technical session entitled “Fuzzy Decision Support Modeling” at EUFIT’99, September 13-16, 1999, Aachen, Germany.

National:

- Chair, ASABE Unmanned Aerial Systems Technical Committee (MS-60).
- Assist USEPA in the evaluation of research proposals that were submitted under two separate programs - 1) Transport and Fate of Contaminants in the Environment, and 2) High Performance Computing in Environmental Systems Analysis, 1995.
- Member of National Science Foundation Cyberinfrastructure Research Committee as part of major research initiative entitled Collaborative Large Scale Engineering Analysis Network for Environmental Research (CLEANER).
- Track Chair for the American Society of Civil Engineers (ASCE).
- EPA Region 7 Onsite Forum Regional Planning Committee
- Member, ASCE Environmental and Water Resources Institute Groundwater Committee
- Chair, ASCE EWRI 2006 World Water Congress Adaptive Management Track
- Member, ASCE EWRI 2006 World Water Congress Local Planning Committee

Regional:

- Coordinator, student paper competition for ASAE Mid-Central Conference (1996).

State:

- Past Chair, Environmental Section, Nebraska Section, American Society of Civil Engineers (1994-2013)
- Chair, Constructed Wetland workshop sponsored by the Nebraska Section, American Society of Civil Engineers (1994)
- Chair, NCEA Environmental Awareness Ad Hoc Committee (1993)
- Nebraska Section, ASCE, assisted in program planning and development for a special technical conference on Solid Waste Landfill Design
- Nebraska Section, ASAE, assisted in program planning and development for a workshop on Compost System Design and Operation
- Nebraska Section, ASCE, assisted in program planning for the annual ASCE combined geotechnical/environmental conference scheduled for March 21, 1997 and provided a presentation on geostatistical applications in environmental engineering.
- Nebraska Well Drillers Association, assisted in the planning and development of a Conference on Well Drilling and Construction with special emphasis on coordinating a UNL student contribution to the conference.

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- Serve on the conference planning and steering committee in the development and delivery of a conference in March 2001 that focused on small community water supply and wastewater treatment systems.
- Work with multi-agency, interdisciplinary team to implement and deliver 1st Alternative Water and Wastewater Technologies for Small Communities Conference, March 28, 2001.
- Provided leadership to a multi-agency Task Force that planned, coordinated, and delivered the first annual conference for the on-site wastewater treatment industry (March 15-16, 2001). The conference was a success with one of the primary impacts being the formation of the Nebraska On-site Waste Water Association (NOWWA), an industry association to advance the professional status of contractors, consultants and regulators. Efforts continue in working with the Task Force.
- Provide leadership to Partners in Pollution Prevention student intern project.
- Develop and apply environmental systems analysis techniques that increase the sustainability of communities with emphasis on waste management.
- Develop pollution prevention oriented projects in Nebraska, and transition into teaching courses in support of Environmental and Water Resources Engineering programs.
- Conference Planning Committee for Nebraska On-site Waste Water Association.
- Serve as an ex-officio member of the Nebraska On-site Waste Water Association (NOWWA) board of directors in partnership with S. Skipton.
- Active involvement in the legislatively mandated, statewide, Onsite Wastewater Advisory Committee, with responsibility to provide advise to the Nebraska Department of Environmental Quality on matters pertaining to regulations, and the licensure and certification of industry professionals.
- Participate in Nebraska Wellhead Protection Network, a coalition of agencies and organizations that are involved in promoting community wellhead protection.
- Coordinate and participate in development of two television segments for “Market Journal and Today's Ag” programs dealing with on-site wastewater systems. Programs were aired Oct 16 (MJ) and Oct 31 (TA).
- Scholarship Committee Chair for the Nebraska Water Environment Association.
- Advisor for the Nebraska Section ASABE.
- Nebraska Wellhead Protection Network (Nov. 2, Tecumseh, Jan. 31, Lincoln)
- Chair, OWAC Endorsement Subcommittee
- Member, Nebraska Onsite Wastewater Advisory Committee
- Member, Nebraska Well Drillers Association Water Resources Leadership Committee
- Review NRD proposals for Nebraska Department of Natural Resources

University of Nebraska-Lincoln:

- Member, UNL Faculty Senate
- Past Member, UNL Recycle Advisory Committee
- Past Member, Commencement Committee (past Committee Chair)
- Past Member, Board of Directors, Nebraska Cooperative Extension Association (NCEA)
- Past Chair, NCEA Ad Hoc Committee on Distance Education Technology
- Member, UNL Employee Benefits Committee

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Institute of Agriculture & Natural Resources:

- Member, Community and Residential Environment Action Team

College of Engineering and Technology:

- Past Member, Search Committee, Director, Center for Infrastructure Research
- Past Member, Search Committee, Environmental Health Engineer
- Assist in the development and implementation, M.S. Environmental Engineering
- Member, Water Resources Committee

Department:

- Faculty Advisor, Student Section of the ASAE (1997)
- Member, Graduate Committee
- Member, Computer Committee
- Member, Hazardous Material Committee
- Member, Safety Committee
- Member, Facility Committee
- Member, Recruiting Committee (Civil Engineering)
- Chair, ABET Portfolio Committee
- Member, Membership Committee
- Supervisor for staff Jan Hygnstrom, Bonita Delhay
- Support ABET review, Nov. 7-9, 2005, Portfolio Committee
- Support and participate in USDA-CREES review, April 10-13, 2006