

Robert Guy Traver, Ph.D., PE, D.WRE, F. EWRI, F. ASCE

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Professional and Academic Essentials

Dr. Robert G. Traver has been a member of the Water Resources and Environmental Engineering Program at Villanova since 1988. He currently serves as Director of both the Villanova Center for the Advancement of Sustainability in Engineering, and the Villanova Urban Stormwater Partnership.

While at Villanova, Dr. Traver has conducted research on topics that include modeling of stream hydraulics, urban hydrology, water quality, and measures to mitigate stormwater effects of urbanization. He has been the main force in creating a Stormwater Green Infrastructure Demonstration and Research Park on the Villanova Campus, and founded the *Villanova Urban Stormwater Partnership* to enable continuing long term stormwater research. Dr Traver believes that research supports and enhances the undergraduate and graduate educational experience. He teaches graduate courses in hydrology, hydraulics, urban storm water management, and undergraduate courses in all facets of water resources

Dr. Traver is a registered professional engineer, a fellow of the American Society of Civil Engineering (ASCE), and a Diplomate of the American Academy of Water Resource Engineers which he served as president. In 2007 he received the Outstanding Civilian Service Medal from the Commanding General of the United States Corps of Engineers for his work on ASCE's External Review Panel (ERP) of the Corps investigation of Hurricane Katrina and in 2014 was honored as the ASCE William H. Wisley American Civil Engineer Award "recognized for his leadership of ASCE's Task Committee on Flood Safety Policies and Practices and editor of the Committee's report, *Flood Risk Management: Call for a National Strategy*." He was a committee member of the National Research Council Committee that authored "Urban Stormwater Management in the United States" (2009). He continues to serve the profession as an associate editor of the ASCE Journal Sustainable Water in the Build Environment which he helped to create. Dr. Traver was appointed member of ASCE's Water Policy Committee, and Chairs the Commonwealth of Pennsylvania's Department of Environmental Protection's Water Resources Advisory Committee.

Education

Ph.D., 1988, Pennsylvania State University, Civil Engineering.
M.C.E., 1982, Villanova University, Civil Engineering
B.S.C.E., 1978, Virginia Military Institute, Civil Engineering

Current Employment

Professor; Department of Civil and Environmental Engineering Villanova University, August 1988 - Present -

Director, Villanova Urban Stormwater Partnership (VUSP), July 2002 – Present -

The mission of the Villanova Urban Stormwater Partnership is to advance the evolving field of sustainable stormwater management (SWM) field and to foster the development of public and private partnerships through research and innovative SWM Best Management Practices, Directed Studies, Technology Transfer and Education.

Director, Villanova Center for the Advancement of Sustainable Engineering, Sept 2009 – Present

VCASE seeks to protect and restore our environment through research on the integration of sustainability principles in engineering practice. To meet "the needs of the present without compromising the ability of future generations to meet their own needs" mandates an inclusive, interdisciplinary, systems approach to research using the campus infrastructure as a test bed. VCASE follows Villanova's Sustainability Policy of supporting the concepts of sustainability in its curriculum, research, and activities, to contribute to an environmentally sound and socially just society.

Previous Experience

1978 – 2003 LTC (Retired) U.S. Army Reserve Officer, Veteran of Operation Desert Storm.

Highest Position held – Deputy Commander 1185th Terminal Transportation Brigade

Awarded Meritorious Service Medal – Honor Graduate Command & General Staff College, 1994

1984 - 1988 The Pennsylvania State University - Doctoral Candidate in Civil Engineering. Dissertation - "Transition Modeling Of Unsteady One Dimensional Open Channel Flow through the Subcritical-Supercritical Interface".

1982 - 1984 Virginia Military Institute, Assistant Professor of Civil Engineering

1981 - 1982 Villanova University, Graduate Assistant - Thesis: "The Downstream Effects of Storm Water Management Detention Basins."

1978 - 1981 Project Engineer, Yerkes Associates, Bryn Mawr, PA

Honors

2014 ASCE – William H. Wisely American Civil Engineer Award

2014 Fellow – American Society of Civil Engineers

2013 Fellow – Environment and Water Resources Institute

2008 Chester County Watershed Stewardship Award

2007 Outstanding Civilian Service Medal – US Army Corp of Engineers

2005 Diplomat, American Academy of Water Resources Engineers

2005 Ruth Patrick Education Award – Water Resources Association of the Delaware

2004 Water Resource Engineer of the Year – Philadelphia Section ASCE.

1978-2003 Numerous Military Awards

Publications

Major Reports & Testimony

1. *Flood Risk Briefing*: Scheduled Congressional infrastructure briefing - 11 May 2015, Washington D.C.
2. *Flood Risk Management: Call for a National Strategy*, Task Committee on Flood Safety Policies and Practices, ASCE Publications, Jun 1, 2014 -
3. *A Review of the Proposed Revisions to the Federal Principles and Guidelines Water Resources Planning Document* National Research Council, National Academies Press, Washington DC, 2010
4. *Comments on Proposed National Rulemaking to Strengthen the Stormwater Program*; Testimony to USEPA Office of Water, Washington DC. 28 January 2010
5. *Efforts to Address Urban Stormwater Runoff*, Testimony to Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, U.S. House of Representatives. Washington DC March 2009
6. *Urban Stormwater Management in the United States*, National Research Council, National Academies Press, Washington DC, 2009
7. *The New Orleans Hurricane Protection System: What Went Wrong and Why – A Report by the American Society of Civil Engineers Hurricane Katrina External Review Panel*, Reston, VA: ASCE, 978-0-7844-0893-3, 2007

Refereed Journal Articles

1. Lewellyn, C.; Lyons, C.; Traver R., Wadzuk, B. (2015) "Evaluation of Seasonal and Large Storm Runoff Volume Capture of an Infiltration Green Infrastructure System", *Journal of Hydrologic Engineering* (in Press)
2. Wadzuk, B., Hickmen M., Traver, R. (2014) "Understanding The Role of Evapotranspiration in Bioretention: A Mesocosm Study," *Journal of Sustainable Water in the Built Environment* 10.1061/JSWBAY.0000794
3. Wadzuk, B., Schneider, D., Feller, M., Traver, R. (2013)"Evapotranspiration from a Green-Roof Storm-Water Control Measure," *Journal of Irrigation and Drainage Engineering* Dec 2013, Vol. 139, No. 12, pp. 995-1003
4. Lee, R., Traver, R., Welker A. (2013) "Continuous Modeling of Bioinfiltration Storm-Water Control Measures Using Green and Ampt." *J. Irrig. Drain Eng.*, 139(12), 1004–1010.
5. Komlos, J., A. Welker, V. Punzi and R. Traver. (2013) "Feasibility Study of As-Received and Modified (Dried/Baked) Water Treatment Plant Residuals for use in Stormwater Control Measures (SCMs)", *J. Environ. Eng.*, 139(10), 1237–1245.
6. Flynn, K., Traver, R. (2013) "Green Infrastructure Life Cycle Assessment: A Bio-Infiltration Case Study", *Journal of Ecological Engineering*, Volume 55, pp 9-22
7. Komlos, J. and Traver, R. (2012) "Long Term Orthophosphate Removal in a Field-Scale Stormwater Bioinfiltration Raingarden," *Journal Environmental Engineering, ASCE.*, Volume 138, Issue 10
8. Hunt, W.F., Davis, A.P., and Traver, R. (2012) "Meeting Hydrologic and Water Quality Goals through Targeted Bioretention Design," *Journal Environmental Engineering, ASCE.*, Volume 138, Issue 6.
9. Davis, A.P., Traver, R.G., Hunt, W.F., Brown, R.A., Lee, R. and Olszewski, J.M. (2012) "Hydrologic Performance of Bioretention Stormwater Control Measures." *Journal Hydrologic Eng, ASCE.*, Volume 17, Issue 5
10. Horst, M., Welker, A., Traver, R. (2011), "Multi Year Performance of a Pervious Concrete Infiltration Basin BMP", *ASCE Journal of Irrigation and Drainage*
11. Traver, R. (2011), "Discussion of "Modeling and Sizing Bioretention Using Flow Duration Control" *Journal of Hydrologic Engineering*
12. Machusick, M., Traver, R., Welker, A., Traver, R. (2011), "Groundwater Mounding At A Stormwater Infiltration Bmp", *ASCE Journal of Irrigation and Drainage*
13. Traver, R., Clark, S., Hunt, W., Struck, S.(2011), "Editorial – Special Issue on Urban Stormwater Management in the 21st Century. *ASCE Journal of Irrigation and Drainage*
14. Davis, A. Hunt, W. Traver, R (2010), "Improving Urban Stormwater Quality: UCOWR Applying Fundamental Principles, *Journal of Contemporary Water Research and Education*
15. Welker, A., Wadzuk, B., Traver, R (2010). "Integration of Education, Scholarship and Service Through Stormwater Management: UCOWR, *Journal of Contemporary Water Research and Education*
16. Wadzuk, B., Rea, M., Woodruff, G., Flynn, K. Traver, R. (2010), "Water Quality Performance of a Constructed Stormwater Wetland for All Flow Conditions", *AWRA*, Volume 46, Issue 2, pages 385–394

17. Emerson, C., Wadzuk, B., Traver, R. (2010), "Hydraulic Evolution and Total Suspended Solids Capture of an Infiltration Trench" *Hydrologic Processes*, Wiley
18. Batrone, T., Wadzuk, B., Traver, R. (2010), "A Parking Deck's First Flush" *ASCE Journal of Hydrologic Engineering*, February 2010
19. Gilbert, R., Traver, R. (2009), "Beyond Assessing and onto Managing Risk for Levees," *UCOWR Journal of Contemporary Water Research and Education*
20. Davis, A. Hunt, W. Traver, R. (2009), "Bioretention Technology: An Overview of Current Practice and Future Needs." *ASCE Journal of Environmental Engineering – ASCE Journal of Environmental Engineering*, ASCE March 2009
21. Traver, R., Clark, S., Struck, S. (2008) Editorial – Stormwater Special Issue, *ASCE Journal of Irrigation and Drainage*.
22. Emerson, C., Traver, R. (2008), Multiyear and Seasonal Variation of Infiltration from Storm-Water Best Management Practices, *ASCE Journal of Irrigation and Drainage*
23. Braga, A., Horst, M., Traver, R. (2007), "Temperature Effects on the Infiltration Rate through an Infiltration Basin BMP", *Journal of Irrigation and Drainage*
24. Kwiatkowski, M, Welker, A., Traver, R., Vanacore, M., Ladd, T. (2007), "Evaluation of an Infiltration Best Management Practice (BMP) Utilizing Pervious Concrete", *Journal of the American Water Resources Association*
25. Welker, A., Gore, M., Traver, R. (2006), "Evaluation Of The Long Term Impacts Of An Infiltration Bmp", *ICHE The 7th In. Conf. on Hydrosience and Engineering*
26. Emerson C., Welty, C., Traver, R. (2006), "Closure of A Watershed-scale Evaluation of a System of Stormwater Detention Basins", *Journal of Hydrologic Engineering*
27. Heasom, W., Traver, R. Welker, A. (2006), "Hydrologic Modeling of a Bioinfiltration Best Management Practice", *Journal of the American Water Resources Association*
28. Emerson C., Welty, C., Traver, R. (2005), "A Watershed-scale Evaluation of a System of Stormwater Detention Basins", *Journal of Hydrologic Engineering*
29. Syed A. Hashsham, S.A., Alm, E. W., Stedtfeld, R. D., Traver, R. G., and Duran, M. (2004), "Detection and Occurrence of Indicator Organisms and Pathogens", *Water Environment Research*, Vol: 75, No: 6. 2004.
30. Traver, R.G., Chadderton, R.A. (2002), "Effectiveness of a Wetland Best Management Practice: First Phase," (with R. Chadderton), *Treatment Wetlands for Water Quality Improvement – Selected papers from Intecol Quebec 2000 Wetlands Conference*, CH2M HILL Canada Limited – Editor John Pries, 2002
31. Traver, R.G. (1994) "Modeling Multiple Critical Depths" *Water Resources Bulletin, Journal of the American Water Resources Association*. Feb. 1994 Vol. 30, No.1, p.85-91.
32. Traver, R.G., Miller, A.C. (1993) "Open Channel Interpolation Of Cross Sectional Properties," *Water Resources Bulletin, Journal of the American Water Resources Association*. October 1993 Vol.29, No.5, p.767-776.
33. Condon, M., Traver, R., Fergusson, W. and R. Chadderton (1993), "Parameter Estimates For A Ground Water Model," *Water Resources Bulletin, Journal of the American Water Resources Association*. Vol.29, No.1, p.95-106.

Books Published - Editor

1. Traver, R.G. Et al (2014) *Low Impact Development Technology: Design Methods and Case Studies* ASCE
2. Traver, R.G. Et al (2014) *Low Impact Development Technology: Implementation and Economics* ASCE

Published Conference Proceedings (Refereed Abstract)

1. Lewellyn, C., Quetti, K., Wadzuk, B., Traver R. (2015) “An Extremely Undersized Infiltration Trench 10 Years Later,” International Low Impact Development Conference 2015: 133-141.
2. Hess, A., Wadzuk, B., Traver, R. (2014) “Construction and Soil Monitoring Plan for an ET-Infiltration Rain Garden Comparison Site”, ASCE – EWRI World Environmental and Water Resources Congress 2014: 105-114.
3. Lord, L.E., Komlos, J., and Traver, R. “Evaluation of Nitrogen Removal and Fate within a Bioinfiltration SCM”, World Environmental and Water Resources Congress 2013
4. Wadzuk, B. and Traver, R. “Design, Construction, and Evaluation of a Stormwater Control Measure Treatment Train” World Environmental and Water Resources Congress 2012
5. Flynn, F., and Traver R. “Methodology for the Evaluation and Comparison of Benefits and Impacts of Green Infrastructure Practices Using a Life Cycle Approach”, World Environmental and Water Resources Congress 2011: Bearing Knowledge for Sustainability
6. Nemirovsky, E. M. Welker, A. L., Traver, R.G. “Evaporation from a Pervious Concrete Stormwater Control Measure: Parameterization, Quantifying and Evaluation”, World Environmental and Water Resources Congress 2011: Bearing Knowledge for Sustainability
7. Schenider, D., Wadzuk, B., Traver, R., “Using a Weighing Lysimeter to Determine a Crop Coefficient for a Green Roof to Predict Evapotranspiration with the FAO Standardized Penman-Monteith Equation;” World Environmental and Water Resources Congress 2011: Bearing Knowledge for Sustainability
8. Hickman, J., Wadzuk, B., Traver, R., “Evaluating the Role of Evapotranspiration in the Hydrology of a Bioinfiltration Basin Using a Weighing Lysimeter” World Environmental and Water Resources Congress 2011: Bearing Knowledge for Sustainability
9. Lee, R. and Traver, R., “Unit Process Simulation of a Bioinfiltration Stormwater Control Measure” World Environmental and Water Resources Congress 2010
10. Komlos, J., Rowe, A., Clark, S., Traver, R. Stinson, M., “Assessing BMP Performance Using Microtox Toxicity Analysis” World Environmental and Water Resources Congress 2010
11. Hickman, J. Schneider, D. Wadzuk, B. Traver, R., “Determination of Evapotranspiration in SCM’s Using a Weighing Lysimeter: An Experimental Approach” World Environmental and Water Resources Congress 2010
12. Feller, M., Traver, R. Wadzuk, B., “Estimation of Green Roof Evapotranspiration—Experimental Results”; EWRI Low Impact Development National Symposium 2010
13. Traver, R., “Stormwater Infiltration Retrofits Experience Gained through Long Term Monitoring”, World Environmental and Water Resources Congress 2009
14. Machusick, M., Traver, R., “The Observed Effects of Stormwater Infiltration on Groundwater”, World Environmental and Water Resources Congress 2009
15. Brown, R. Et al,” Bioretention/Bioinfiltration Performance in the Mid-”, World Environmental and Water Resources Congress 2009
16. Traver, R., Et al. “Stormwater Concepts – No Adverse Impact”, EWRI Low Impact Development National Symposium 2008
17. Horst, M., Traver, R. “BMP Pollutant Removal Efficiency”, ASCE EWRI National Symposium 2008.
18. Emerson, C., Traver, R. “Long-Term Characteristics of Infiltration Best Management Practices”, ASCE EWRI National Symposium 2008.
19. Wadzuk, B., Traver, R. “Nutrient Loading in a Mature Constructed Stormwater Wetland”, ASCE EWRI National Symposium 2008.
20. LeBoon, M., Traver, R. “An Infiltration Model Of An Underground Rock Storage Bed Infiltration Bmp”, ASCE EWRI

National Symposium 2007.

21. Wadzuk, B, Heasom, W., Traver, R., "Re-conceiving the Villanova University Constructed Stormwater Wetland", ASCE EWRI National Symposium 2007
22. Heasom W., Traver, R. "Modeling a BioInfiltration Best Management Practice," LID National Symposium, 2007
23. Davis A, Hunt, W., Traver R. Clar, M. "Bioretention Technology: An Overview of Current Practice and Future Needs" LID National Symposium, 2007 (Extended Abstract)
24. Tokarz, E. Traver, R., Heasom, W. "Experiences from Long Term Monitoring of Stormwater Infiltration BMPs", LID National Symposium, ASCE 2007 (Extended Abstract)
25. Gore, M., Welker, A. Traver, R., "Evaluation of the Long Term Impacts of an Infiltration BMP" ICHE 2007
26. Heasom, W., Traver R., "Modeling a BioInfiltration Best Management Practice " LID National Symposium, ASCE 2007 (Extended Abstract)
27. Ermilio, J., Traver, R, "Hydrologic and Pollutant Removal Performance of a Bio-Infiltration BMP", EWRI 2006 – National Symposium
28. Rea, M., Traver, R. Performance Monitoring of a Stormwater Wetland Best Management Practice, National Conference, World Water & Environmental Resources Congress 2005 (EWRI/ASCE)
29. Emerson, C., Traver, R., The Villanova Bio-Infiltration Traffic Island: Project Overview, National Conference, World Water & Environmental Resources Congress 2004 (EWRI/ASCE)
30. Traver, R., Infiltration Strategies for Low Impact Development, National Conference, World Water & Environmental Resources Congress 2004 (EWRI/ASCE)
31. Traver, R Et al. "Designing for Infiltration A Perspective", EWRI (ASCE 2003) World Water & Environmental Resources Congress, Philadelphia, PA
32. Traver, R., "Development of a BMP Research and Demonstration Park," 9th *International Conference on Urban Storm Drainage*, Environmental and Water Research Institute, ASCE, 2002
33. Traver, R., "Lessons Learned - The Villanova Stormwater Wetland," 2001 *Pennsylvania Stormwater Management Symposium*," Villanova University (Oct 2001).
34. Traver, R., "Routing Through a Wetlands Best Management Practice – A Validation," *ASCE National Specialty Conference*, EWRI (Summer 2001)
35. Traver, R., "Creating a Stormwater Wetland Best Management Practice – A Retrofit," *ASCE National Specialty Conference*, EWRI (Summer 2000)
36. Traver, R., "Stormwater Wetland BMP Performance A Continuing Study," *ASCE National Specialty Conference*, Water Resource Planning and Management Division (June 1999)
37. Traver, R., "Stormwater Wetlands Retrofit," 1999 *South Eastern Pennsylvania Stormwater Management Symposium*, Villanova University (Oct 1999).
38. Traver, R., "Stormwater Wetland BMP Performance – A Continuing Study," *ASCE National Specialty Conference*, Water Resource Planning and Management Division (June 1999)
39. Traver, R., "Effectiveness of a Combined Urban Wetland Detention Basin - First Results", *ASCE National Specialty Conference*, Water Resource Planning and Management Division, 1998
40. Traver, R., "Evaluation of the Effectiveness of an Urban Stormwater BMP - The Villanova Experience," 1998 *Pennsylvania Stormwater Management Symposium*. Villanova University, Oct 1998.
41. Traver, R., "Planning for NPDES Phase 2 in Pennsylvania," 1998 *Pennsylvania Stormwater Management Symposium*. Villanova University, Oct 1998.
42. Traver, R., "Watershed Planning In Pennsylvania," 1997 *Water Resources Planning and Management Conference*, ASCE.
43. Traver, R., "Implementation of Watershed Planning in Chester County Pennsylvania," 1996 *Water Resources Planning and Management Conference*, ASCE.
44. Traver, R., "A Study into Effectiveness of Urban Best Management Practices," 1996 *Water Resources Planning and Management Conference*, ASCE.
45. Traver, R., "Effectiveness of Detention Based Stormwater Management on The Brandywine," 1995 *Water Resources Planning and Management Conf.*, ASCE.
46. Traver, R., "Effect of Nonstandard Rainfall Distributions on Storm Water Management Detention Basins," 1994 *Water Resources Planning and Management Conference*, ASCE.

47. Traver, R., "Investigation of Urbanization on the Brandywine River," *1994 Symposium on Stormwater Runoff and Quality Management*, Pennsylvania State University, September 1994.
48. Traver, R., "Parameter Estimates for a Groundwater Model" - *HYDRAULICS '93, Proceedings of the Hydraulics Division*, ASCE, July 1993.
49. Traver, R., "Modeling Critical Depth in Open Channels," *HYDRAULICS '93, Proceedings of the Hydraulics Division*, ASCE, July 1993.
50. Traver, R., "Accumulation Effect of Stormwater Management Detention Basins" - *WATER FORUM 1992, Hydraulics Division*, ASCE, Aug 1992.
51. Traver, R. Et al, "Modeling Stormwater Basin Effects" - *WATER FORUM 1992*, Water Resources Planning and Management Division, ASCE, Aug 1992.
52. Traver, R., "A Comparison of Accuracies of Steady Water Surface Profiles" - *National Conference on Water Resources Planning and Management Division*, ASCE, May 1991.
53. Traver, R., "Application of Numerical Methodology to Hydraulic River Modeling" - *9th National Conference on Microcomputers in Civil Engineering*, Univ. of Central Florida, Oct 1991.
54. Traver, R., "Numerical Accuracies in Steady Open Channel Flow", *ASCE Hydraulics Division, National Conference on Hydraulic Engineering*, ASCE, Hydraulics Division, August 1990.
55. Traver, R., "Improved Numerical Analysis of Steady Water Surface Profiles," *National Conference on Hydraulic Engineering and International Symposium on Sediment Transport Modeling*, ASCE, Hydraulics Division, August 1989.
56. Traver, R., "A Numerical Analysis Approach to the solution of Unsteady Flow in Open Channels," *National Conference on Hydraulic Engineering and International Symposium on Sediment Transport Modeling*, ASCE, Hydraulics Division, August 1989.
57. Traver, R., "Modeling Unsteady One Dimensional Open Channel Flow Using The Slope Friction Form Of The Saint Venant Equations," *National Conference on Hydraulic Engineering*, ASCE, Hydraulics Division, August 1987.
58. Traver, R., "The Downstream Effects of Storm Water Detention Basins," *International Symposium on Urban Hydrology, Hydraulics and Sediment Control*, University of Kentucky, July 1983.

Invited Presentations (National and International - Selected)

1. 2015 - "Green Infrastructure Performance Studies" International Low Impact Development Conference (Minn.)
2. 2015 - "Planning for a Rainy Day (With Wadzuk, B.) Cuidad Del Saber, Panama
3. 2014 - "The Hurricane Protection System in New Orleans" Cuidad Del Saber, Panama
4. 2013 - "LID Research" International Low Impact Development Conference (Texas)
5. 2011 - Keynote - International Forum on Water Management, University of Sherbrooke Canada
6. 2011 - "Present and Future Directions with LID Research" International Low Impact Development Conference (PA)
7. 2010 - "Continuous flow and Quality Simulation of a Stormwater Infiltration Trench", International Association of Hydro-Environment Engineering and Research, New Zealand

Current Research

Grants				
Title	Year 1	Role	Agency	Status
VUSP ~ PaDEP BMP National Monitoring Site Year 11-12	2013	Lead: R. Traver Co: B. Wadzuk	USEPA/PADEP	In Progress
VUSP ~ PaDEP BMP National Monitoring Site Year 13-15	2015	Lead: R. Traver Co: B. Wadzuk	USEPA/PADEP	Awarded
Optimal Balance of Infiltration-Evapotranspiration for Vegetated SCMs	2014	Lead: B. Wadzuk Lead: A. Welker Co: R. Traver	PaDEP	Accepted 2014
Monitoring – Watershed Protection Grant	2014	Lead: A. Welker Support: R. Traver	William Penn Foundation	Accepted 2014

Grants				
Title	Year 1	Role	Agency	Status
Next Generation Volume Reduction Green Infrastructure Stormwater Control	2013	Lead: R. Traver Co: A. Welker Co: B. Wadzuk Co: G. Clayton	USEPA	In Progress
USEPA – Temple Support	2013	Lead: R. Traver	USEPA	In Progress
Rain Garden Configuration to Maximize Hydrologic Performance	2013	Co: R. Traver Co: A. Welker	PA Growing Greener	In Progress
Solar Charge – Green Roof Hub	2014	Lead: B. Wadzuk Support: R. Traver	USEPA	In Progress
Green Cities Research Center	2015	Lead: R. Traver Co: A. Welker Co: B. Wadzuk	PWD	Awaiting Contract
VUSP PARTNERS	Cont	R. Traver	CORPORATE MEMBERSHIP	Ongoing

PROFESSIONAL ACTIVITIES (since 2000)

Professional Engineer--Commonwealth of Virginia, Commonwealth of Pennsylvania
 Chair, Pennsylvania Department of Environmental Protection Water Resources Advisory Committee (2008)
 Committee Member - ASCE's National Energy, Environment and Water Policy Committee (2010)
 Associate Editor ASCE Journal of Sustainable Water in the Built Environment (2014)
 Chair 2011 National Low Impact Development Conference, Philadelphia PA
 Chair, and Organizer of the 1998, 1999, 2001, 2003, 2005, 2007, 2009, 2013 Pennsylvania Stormwater Management Symposium
 2003 - 2006 – Member - Pennsylvania Stormwater Management Manual Oversight Committee

PROFESSIONAL SOCIETIES

2010 – Current Control Group Member – ASCE /EWRI UWRRE
 2012 - 2014 Chair – ASCE Committee on Flood Risk Reduction
 2005 - 2006 President and Diplomat, American Academy of Water Resources Engineers
 2009 - 2010 – Committee Member - National Academies - *Improving Principles and Guidelines for Water Resources Planning by the U.S. Army Corps of Engineers.*
 2006 - 2008 – Committee Member - National Academies - *Reducing Stormwater Discharge Contributions to Water Pollution.*
 2008- 2014 – Associate Editor – Stormwater – Journal of Irrigation and Drainage
 2005 - 2008 ASCE Corps of Engineers External Review Panel – Hurricane Katrina
 2005 – 2008 Chair – EWRI Stormwater Infrastructure Committee
 2002- 2006 Control Group Member of the "Water Resources Planning Council " for the ASCE Environment and Water Resource Institute, American Society of Civil Engineers.
 1990 – Current -- Reviewer - ASCE: Journals, Irrigation and Drainage, Hydraulic Engineering, Hydrology, Environmental Engineering, and Water Resources Planning and Management.
 1994 - Current - Reviewer for AWRA Journal.
 Member AWRA, Chi Epsilon - Tau Beta Pi - Sigma Xi