**Mission Statement:** The mission of the Villanova Urban Stormwater Partnership is to advance the evolving comprehensive stormwater management field and to foster the development of public and private partnerships through research on innovative SWM Best Management Practices, directed studies, technology transfer and education.

- Research and directed studies will emphasize comprehensive watershed stormwater management planning, implementation, and evaluation.
- Technology transfer will provide tools, guidance and education for the professional.
- Partnership Goal is to promote cooperation amongst the private, public and academic sectors.

**Partners**

- Nonpoint Source National Monitoring Program
- Down To Earth
- Philadelphia Water Department
- Delaware County Conservation District

**Members**

- Cahill Associates
- Taylor Wiseman & Taylor
- Langan
- MOMENEE AND ASSOCIATES, INC.
- TWT
- F. X. Browne, Inc.
- OBRIEN & GERE
- HANFLAND & GIBB

**Friends**

- Princeton Hydro
- van note - harvey

**Penn Environmental**

**Bohler Engineering**
Academic Partners

Faculty – R. Chadderton, M. Duran, R. Traver, B. Wadzuk, A. Welker,
Graduate Students Advised:

M.S. Students; Last 5 years: M. Vanacore, D. Salas-De La Cruz, J.
Ermilio, A. Braga, E. Dean, G. Woodruff, M. Rea, M. Kwiatokski, T. Ladd, C. Emerson
(Drexel), M. Prokop; In Progress:, E. Tokarz, T. Batroney, K. Issacs-Ricketts, M.
Machusick, J. Marge, M. Fuller.

Ph.D. Candidates – Clay Emerson

Conferences Hosted
Proceedings published – Projected live and recorded

Referred Publications
1. Braga, A., Horst, M., Traver, R. “Temperature Effects on the Infiltration Rate through an
Best Management Practice (BMP) Utilizing Pervious Concrete”, AWRA, Oct 2007
Bmp”, ICHE The 7th In. Conf. on Hydroscience and Engineering (ICHE-2006).
4. Emerson C., Welty, C., Traver, R. “Closure of A Watershed-scale Evaluation of a System of
5. Heasom, W., Traver, R. Welker, A., “Hydrologic Modeling of a Bioinfiltration Best
Detention Basins”, Journal of Hydrologic Engineering, ASCE, May 2005
“Detection and Occurrence of Indicator Organisms and Pathogens”, Water Environment
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

Referred - Submitted
2. Emerson, C., Traver, R., Long-Term and Seasonal Variation of Stormwater Infiltration Best
Conference Proceedings (Last 3 years)
2. Wadzuk, B, Heasom, W., Traver, R.,”Re-conceiving the Villanova University Constructed Stormwater Wetland”, ASCE EWRI National Symposium 2007

Other Publications
Stormwater Magazine –
“Bioretention And Bioinfiltration BMPs” – Oct 1007
“Villanova University Stormwater Partnership” September 2006
“Constructing an Infiltration Trench Retrofit BMP” July 2005
“Lessons in Porous Concrete,” July 2005
“VUSP Porous Concrete” July 2004

Conferences Hosted
Proceedings published – Projected live and recorded

Grants In Progress: (Partial)
2007- 2009 – Pervious Concrete – Porous Asphalt Comparison Study (EPA, PADEP, Prince Georges County)
2007-2009- Watershed Impact of Stormwater Bioretention and Bioinfiltration BMPs – CiCCEET (With University of Maryland and NC State)
2007-2008 Nutrient Loading in a Mature Constructed Stormwater Wetland EPA
2006-2009 – BMP Raingarden Cluster – Pennsylvania Growing Greener II
2006- 2007 Temple Villanova Sustainable Stormwater Initiative
William Penn Foundation
2002 – Present Villanova Urban Stormwater Partnership
EPA / Pa Growing Greener Grant Programs
2003 – Present – EPA National Monitoring Program
Project Sites

**Stormwater Wetland** - (319 Grant - 1998): An existing stormwater detention basin on Villanova University property has been converted into an extended detention wetland BMP. The stormwater wetland treats runoff from a 41 acre site that includes 16 impervious acres. The contributing watershed forms the headwaters of a watershed listed as medium priority on the degraded watershed list. Educational signage has been installed and a website has been created to facilitate technology transfer. The project has been published as an EPA 319 Success Story. Currently under renewed study.

**Bioinfiltration Traffic Island**. – (Growing Greener Grant, 2001 – concluded) A traffic island was retrofitted creating a Bioinfiltration BMP during summer 2001. The facility provides for infiltration of the initial first flush. Educational signage has been installed to enhance the learning experience, and a website has been created to facilitate technology transfer. Groundwater Monitoring has been added to this site for 2007.

**Porous Concrete Demonstration Site** – (319 Grant, 2002 – concluded) The 319 grant was to create a porous concrete infiltration facility in an existing central paved area on the Villanova University campus. The porous concrete site was built in 2002, but the initial concrete pour failed. This surface was replaced in the summer of 2003, and repaired in 2004. Similar to the concept of the Bioinfiltration Traffic Island, runoff from the site and surrounding buildings are captured and infiltrated, decreasing the flows and pollution to a high priority stream segment on the 303(d) list. The site has a much higher capacity than the Bioinfiltration Traffic Island as it overlies a large rock holding bed. Sampling was halted at this site in Dec 2006.

**Infiltration Trench** (319 Grant – Constructed August 2004). The project is designed to capture runoff from an elevated parking deck and then infiltrate it through a rock bed into the ground. The project presents some unique possibilities. As the water is piped through storm drains to the site, filtration devices can be used and tested at this site. It is the only site available with a 100% impervious drainage area.

**Pervious Concrete / Pervious Asphalt** (EPA, 319 Program – NRMCA – Prince Georges County). This project is designed to capture runoff from a faculty staff parking area on campus, and then pass the flow through either a pervious concrete or porous asphalt surface course, and then infiltrate it through a rock bed into the ground. The project presents some unique possibilities, to include comparing the performance from both a hydrologic and environmental view of the technologies. Hydrocarbon testing is part of the project, and it will be added to the NMP in 2008.

**Green Roof** (Villanova University 2006) This Green Roof is a demonstration and undergraduate research / laboratory experience project. A raingage, overflow gage, and temperature sensors are mounted. Constructed on the CEER first floor roof, it is visible from the second floor stairway.