



Chesapeake Bay Stewardship Fund

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Chesapeake Bay Stormwater Training Partnership: Phase 1 and 2

Organization: Chesapeake Stormwater Network

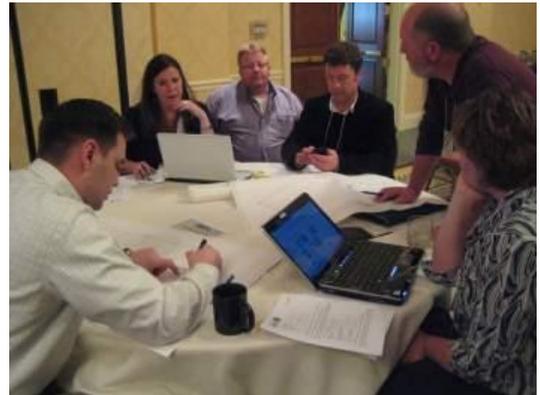
Project Partners: Center for Watershed Protection; Stormwater Maintenance, LLC.

VA Dept. of Conservation and Recreation; District Department of Environment; WV Dept. of Environmental Protection; New York Department of Environmental Conservation, Pennsylvania Department of Environmental Protection, Delaware Department of Natural Resources and Environmental Conservation

Grant Award: \$ 1,000,000 (two grants)

Matching Funds: \$ 1,478,937

Project Description. Over the past three years, the Chesapeake Bay Stormwater Training Partnership (Partnership) has delivered more than 34,000 hours of training to stormwater professionals from local government and private sectors in Maryland, Virginia, West Virginia and the District of Columbia. The goal of the Partnership, which is coordinated by the Chesapeake Stormwater Network (CSN) and the Center for Watershed Protection (CWP), is to provide effective and targeted training leading to enhanced nutrient removal through better design, installation and maintenance of stormwater practices at existing, new and redevelopment projects. A secondary goal is to evaluate different modes of training in order to help identify the most effective training formats for future training programs. This final report provides a detailed summary of the types of training provided by the Partnership and evaluates its effectiveness based on information collected through surveys and training evaluations. The partnership collectively provided more than 37,000 training hours to 15,000 participants on 37 different stormwater topics.



Goals and Outcomes. The major types of training provided by the Partnership were 1) webcasts, 2) 1-day design workshops, 3) 2-day Master Stormwater Practitioner workshops, 4) online training modules, 5) general training support tools and 6) intensive surveys of stormwater practitioner needs and preferences.

Webcasts include approximately two hours of technical content and feature expert guest speakers to provide concrete examples and real world case studies of the topics at hand. The 19 webcasts conducted during the grant have been archived and posted on the CSN website so they can be viewed in their entirety after the initial run.

1-day design workshops are tailored for smaller groups of approximately 35 people and the audience is primarily composed of the local community. The goal of the workshops was to assist local

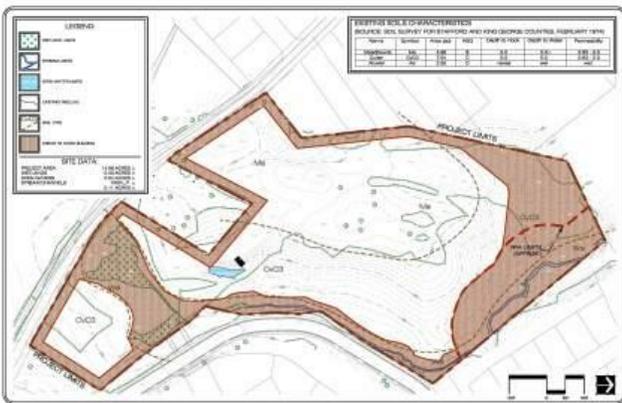
governments to implement their new state stormwater requirements. The 23 workshops were tailored to meet local needs and designed to be interactive.

2-day Master Stormwater Practitioner (MSP) workshops are ideally designed for small groups, but were also held for larger number of participants based on the demand for training, with the audience similarly composed of the local community. 7 multi-day MSPS workshops were conducted to prepare individuals to understand the background and basis for the hydrologic and hydraulic design criteria and BMP specifications (including both structural and non-structural practices).

Online training modules are technical training materials posted on the Partnership website to allow stormwater professionals to learn from them at their own pace without the expense and time commitment that a workshop or webcast would require. 37 different stormwater topics were developed during the grant, and all have now been migrated to the new "College of Stormwater Knowledge" on the updated CSN website.

Other Training Support: A key part of the grant was developing improved stormwater BMP design specifications, technical bulletins, design resources, state-specific stormwater compliance spreadsheets and model site plans. More than 30 different technical resources were specifically developed as part of the grant.

Surveys: A series of survey monkey instruments were used to design, refine and evaluate the CBSTP training program. These included 450 Responses of CSN Survey on Stormwater Training Needs and Preferences, 1100 Evaluations of Quality of Individual Training Events and 600 + Before and After Surveys of Changes in Trainee Stormwater Knowledge and Behavior



Status. Since its inception through mid-April of 2012, the Partnership has trained 15,140 people and provided an estimated 37,469 training hours. Table 1 summarizes number of training events, number of participants and number of training hours for each of the major training modes

Table 1 Phase 1 CBSTP training Summary as of 4/15/2012

Training Mode	# of Events	# of Participants	# of Training Hours	Participants per/Event	Hours per Event	# of Evaluations
Webcasts	19	5,200	10,700	274	563	463
1 day workshops	23	950	6,554	41	285	364
2 day workshops	7	437	7,385	62	1055	253
Online Modules *	26	8,553	12,830	329	493	21
TOTAL	75	15,140	37,469			1101

* conservative estimates as statistics reflect reporting for first 15 months of CBSTP website, download activity from 12/15/2011 to 4/15/2012 not included

The Partnership has established a web site that serves as the hub of activities:
www.chesapeakestormwater.net

Challenges and Lessons Learned. The Surveys gave the team useful insight into the brain of a bay stormwater engineer. For example, we asked 5 multiple choice questions to measure their nutrient IQ -- and discovered it was virtually non-existent. Collectively, they gave the correct response 26% of the time, although random guessing would have scored 20%. At the same time, 75% reported they had a good to excellent knowledge about nutrients! We have re-tooled our training approach to emphasize more on nutrients, and how they can boost nutrient removal in design.

The second key finding is that most designers have not yet designed projects using the innovative practices at the heart of LID. The third finding is that they are still disproportionately designing or approving practices with low nutrient reduction performance. Another finding was that they were not interested in learning about new stormwater practices, and it is clear that they have biases against, or at least a strong discomfort with the practices they do not use. This has led the CBSTP to devise new ways to sell the practices, with an emphasis on peer examples where they have been successfully used.

Designers and plan reviewers really like the state spreadsheet compliance tools that were jointly developed by CWP and CSN, as they make it much easier to understand and comply with new requirements. The practice sessions using the spreadsheets on real world development sites is always the highlight of the design workshops

One important factor that influenced the training program was the uncertainty over the final adoption of stormwater regulations in Virginia and the District of Columbia. The demand for training appears to be strongly linked to the rollout of new stormwater requirements. Demand was quite high in Maryland and West Virginia because designers and localities were confronting new requirements. By contrast, demand was sluggish in Virginia and DC because the shape and nature of proposed regulations has not yet been fully resolved.

Designers and plan reviewers appear to like the status of becoming a master stormwater practitioner (MSP), and they are eager to attend advanced training and interact with their peers. However, one of our grant assumptions was that we could pay MSPs to deliver training didn't seem to pan out. Most MSPs thought training should be left to CSN, CWP and a handful of other stormwater experts, and felt the mini training contracts were not really worth the trouble. They do plan on using the extensive training materials that they were given, but indicated that they would use it mostly for internal training within their company or local stormwater agency.

A new training population emerged as new stormwater requirements were rolled out for federal facilities and development projects. The CBSTP team worked with federal agencies to understand the needs of this new and important training population, and develop associated training content .

Localities also need more guidance to prepare watershed implementation plans to comply with the g Bay-wide nutrient TMDL. Our surveys indicated that they regarded this as a top training priority to help guide them through this largely uncharted process. Although this topic was not on our radar when the grant was written, we re-allocated CBSTP training resources to focus to include nutrient accounting for local stormwater managers.

In summary, the one key piece of advice for other conservation organizations is that even relatively small investment in surveys and evaluations pay big dividends, and enabled us to align or training content and modes to the real needs, preferences and attitudes of our target training population

Table 2: Update on the College of Stormwater Knowledge: CBSTP On-line modules

#	Topics	Slide Show	Resources	Archived Webcast	Spec, TB or CS
Basics					
1	Nutrient Primer for Engineers	X	X	X	X
2	Impervious Cover/ Stream Health	X	X		X
3	Comparing Urban BMPS	X			
4	Runoff Reduction Theory	X	X		X
5	Site Planning for Stormwater	X	X		
Stormwater BMP Design					
6	Green Roof Design	X	X	X	X
7	Sand Filter Design	X			X
8	Wet Pond Design	X	X		X
9	Constructed Wetland Design	X	X	X	X
10	Bioretention Design	X	X	X	X
11	Swale Design	X	X		X
12	Infiltration Design	X	X		X
13	Permeable Pavement Design	X	X	X	X
14	Rainwater Harvesting	X	X	X	X
15	Filter Strips and Soil Amendments	X	X		X
16	Non-Structural Urban BMPs	X	X		X
Special Topics					
17	Design for Redevelopment Projects	X	X	X	X
18	Design for Coastal Plain Terrain	X	X	X	X
19	Design for Karst Terrain	X		X	X
20	Design for Stormwater Hotspots	X	X		X
21	Design for Ultra-urban Conditions	X	X	X	X
22	LID Maintenance	X	X	X	
State Specific Stormwater Resources					
23	District of Columbia		X		CS
24	Delaware		X		
25	Maryland	X	X	X	CS
26	New York		X		
27	Pennsylvania		X		CS
28	Virginia	X	X		CS
29	West Virginia	X	X	X	CS
30	Federal Facilities		X		
Urban Watershed Restoration Techniques					
31	Chesapeake Bay Nutrient Accounting	X	X	X	X
32	Stormwater Retrofits	X	X	X	X
33	Stream Restoration	X	X	X	
34	Urban Fertilizer Management		X		
35	Residential Stewardship Practices	X	X	X	
36	Illicit Discharge Prevention		X		
37	Street Sweeping		X		

Note: Yellow shading indicates where content has been developed for additional on-line modules, and will be expanded during Phase 2 of the CBSTP Grant

Phase 2 of the CBSTP. The Training Partnership will continue through 2014 and is continually evolving to meet the needs and preferences of the Chesapeake Bay stormwater community. Key initiatives in Phase 2 of the CBSTP include:

- State-specific stormwater training in DC, DE, PA, WV, VA and NY
- Field and classroom training in stormwater retrofits
- Field and classroom training on LID installation and maintenance
- Special stormwater training for federal facilities
- Intensive local training on Watershed Implementation plans for the Bay TMDL
- Continued expansion of the "College of Stormwater Knowledge"

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