



Stormwater & Green Infrastructure Workforce Development Forum Report

APPENDICES

Appendix A: List of Forum Participants

Local Government Forum Attendees	
Sarah Anderson, American Forests*	Neely Law, Center for Watershed Protection*
James Barnhart, LGAC, West Virginia Delegation	Julie Lawson, District of Columbia
Randy Bartlett, Fairfax County, VA	Lori Lilly, Howard EcoWorks*
Richard Baugh, LGAC, Virginia Delegation	Leo Lutz, LGAC, Pennsylvania Delegation
Carin Bisland, EPA Chesapeake Bay Program	Andria McClellan, LGAC, Virginia Delegation
Jessica Blackburn, Alliance for the Chesapeake Bay	Faith McNeill, Latin American Youth Center
Amanda Bland, Alliance for the Chesapeake Bay	Brianne Nadeau, LGAC, District of Columbia Delegation
Antonia Bookbinder, MD-National Capital Park and Planning Commission*	Jacob Newman, Latin American Youth Center
Patty Bubar, LGAC, Maryland Delegation	Erin O'Grady, Alliance for the Chesapeake Bay*
Josh Burch, DC Department of Energy & Environment*	Matt Pennington, Eastern Panhandle Regional Planning & Development Council, WV*
Ed Bustin, LGAC, Pennsylvania Delegation	Tuana Phillips, EPA Chesapeake Bay Program
Mark Cameron, Baltimore City, MD	Don Phillips Jr., LGAC, Delaware Delegation
Laura Cattell Noll, Alliance for the Chesapeake Bay	Kelly Porter, LGAC, Maryland Delegation
Ola-Imani Davis, Alliance for the Chesapeake Bay	Jake Reilly, National Fish & Wildlife Foundation*
Jacob Day, LGAC, Maryland Delegation	Gwen Ross, PA Department of Community & Economic Development
Jimmy Dick, Environmental Quality Resources	Ted Scott, Stormwater Maintenance and Consulting*
Liz Feinberg, National Fish & Wildlife Foundation	Ann Simonetti, LGAC, Pennsylvania Delegation
Rachel Felter, Alliance for the Chesapeake Bay	Phillip Stafford, MD Department of Natural Resources
Michael Ferrari, Department of Labor	Jennifer Starr, Alliance for the Chesapeake Bay*
Ronald Fithian, LGAC, Maryland Delegation	Kathy Stecker, MD Department of the Environment
Kate Fritz, Alliance for the Chesapeake Bay	Charlie Stek, Citizens Advisory Committee
Beth Ginter, Chesapeake Bay Landscape Professional Program*	James Sullivan, DE Department of Natural Resources and Environmental Control
Jasmine Gore, LGAC, Virginia Delegation	Adrienne Summers, Howard County Community College

Michael Helfrich, LGAC, Pennsylvania Delegation	Bradley Thompson, Community College of Baltimore County
Chuck Herrick, New York University	Jared Tomlin, City of Martinsburg, WV
Julia Hillengas, PowerCorps	Jacqueline Weinberger, CEO Works
Cynthia Hull-Miller, Blue Ridge Community & Technical College	James Wheeler, LGAC, Pennsylvania Delegation
Abbi Huntzinger, Alliance for the Chesapeake Bay*	Bruce Williams, LGAC, Maryland Delegation
Ann Jurczyk, Chesapeake Bay Foundation	Phil Wilson, MD-National Capital Park and Planning Commission
John Kennedy, VA Department of Environmental Quality	Shea Zwerver, PA DCNR Bureau of Forestry

Additional Planning Team Representatives <i>(who were unable to attend the forum)</i>	
Ryan Davis, Alliance for the Chesapeake Bay	Anthony Nolan, Prince Georges County Park and Planning Division Chief
Dave Hirschman, Hirschman Water	Ellen Shultzabarger, PA DCNR Dept of Forestry
Jenny McGarvey, Alliance for the Chesapeake Bay	Dana Stein, Baltimore Civic Works
Jenna Mitchell, Alliance for the Chesapeake Bay	Ashe Wellington, Civic Works' Center for Sustainable Careers

*Served on the Forum Planning Team

Appendix B: Backgrounder

BACKGROUND 2019 NFWF/LGAC Local Government Forum: Stormwater & Green Infrastructure Workforce Development September 11, 2019

This document is intended to provide participants in the Local Government Forum with foundational information and an understanding of the preliminary recommendations for addressing the problem identified below. We ask that all participants review this information in advance and that you come to the meeting prepared to contribute to the development of specific actionable recommendations.

Introduction and Problem Statement

Each year the Local Government Advisory Committee (LGAC) to the Chesapeake Executive Council hosts a one-day problem solving forum, where LGAC members and expert stakeholders come together to take a deep dive on an environmental issue in the Chesapeake Bay of utmost importance to local leaders and their communities. This forum is sponsored by the National Fish & Wildlife Foundation (NFWF) and is invitation-only. Topics from previous years include [incorporating green infrastructure into capital improvement plans](#), [filling capacity gaps in technical assistance](#) and [land use considerations](#).

In the past several years, LGAC members have sought insight and understanding of local leaders' water resource priorities, and through additional grant funding, hosted a large number of local elected official roundtables in VA and PA to discuss local priorities within the watershed. A recurring theme we heard was increasing the *opportunities for workforce development*, and the problem of an inadequate workforce to support maintenance of stormwater and green infrastructure best management practices (BMPs). In the 2018 LGAC recommendations letter to the Chesapeake Executive Council (see figure 1), LGAC advocated for the need to support and expand workforce development programs.

Figure 1. LGAC Workforce Development Recommendations to the Chesapeake Executive Council, 2018:

To address local government staffing gaps, jurisdictions should support programs to train targeted groups, including offenders, veterans and other disadvantaged populations, to perform such functions as installing and maintaining green infrastructure. Such programs could be designed to address challenging local issues such as the opioid epidemic, reducing recidivism, and lack of staff to perform maintenance functions on public infrastructure. Models for these types of programs include Civic Works in Baltimore and the Virginia Department of Corrections, Academy for Staff Development, which currently provides on-the-job practical learning programs in Culinary Arts, Housekeeping and Maintenance. Offenders selected for these programs are provided with certificates upon completion and/or release to reflect the skills and knowledge they have obtained while in these re-entry programs. Another suggestion which we believe has merit is a student loan forgiveness program for people who choose to work in the public sector. We believe this could be particularly beneficial in terms of attracting civil engineers and other technically trained staff to work in local government.

Many local governments have not identified their community needs around the operations and maintenance of stormwater and green infrastructure BMPs. Determining these needs will help a community to develop the best process to efficiently and effectively maintain municipal BMPs and develop a robust green collar workforce. Several excellent workforce development models exist throughout the region and could be adapted and replicated to other parts of the region in order to facilitate growth in the local green economy. (Problem Statement)

LGAC is hosting this year's forum in order to provide the Chesapeake Bay Program leadership with more specific recommendations for better meeting the workforce needs in communities across the Bay region.

Forum Goal

By the end of the day, we expect to identify current programs that **combine meaningful employment, a living wage, and marketable trade skills** to showcase successful workforce development and training programs. We will identify the gaps in the existing programs that need to be addressed in order to bolster the "green collar" workforce (i.e. job pipelines/support) and meet the variety of technical and entry level maintenance needs that communities require across the Bay.

This forum will bring together experts to brainstorm recommendations for expanding existing models and introducing new and innovative workforce development opportunities.

Background and Assumptions

The Forum Planning Team helped LGAC identify the key barriers to workforce development across the region. We developed a set of assumptions to guide and focus the day, since this is a broad topic that involves many partners and varying local demand and supply.

The following are the guiding set of assumptions:

- Numerous training opportunities exist for **entry level opportunities** (such as Baltimore Civic Works and Howard EcoWorks). These types of programs not only train workers on basic skills, but have a multitude of social goals, supporting underemployed populations and providing case management support to help with job readiness skills.
- **Training for more technical skills to support larger stormwater and green installation and maintenance projects exist, and will be the focus of this forum as we seek examples to adapt and expand these types of programs in regions where there are gaps in the availability of programs.**¹
- Local needs vary depending on many factors including the maintenance needs of a community and scale of projects, the capacity of the local government to support jobs, and whether other goals are trying to be met by implementing a training program. There is **no one stop shop solution for workforce development that can be applied across the Chesapeake Bay.**
- When focusing solely on stormwater or green infrastructure maintenance, there may not be enough jobs available to support a dedicated training program. **When expanding focus to other sectors (wastewater, drinking water, etc.) there are more opportunities to support jobs.**

¹ See the *Program Comparison Matrix* for a highlight of varying types of workforce development programs that currently exist.

Appendix C: Agenda



Forum Agenda: Stormwater & Green Infrastructure Workforce Development 10:00 am - 4:00 pm, September 11, 2019

Location: National Conservation Training Center (NCTC), 698 Conservation Way, Shepherdstown, WV 25443

Problem Statement: Many local governments have not identified their community needs around the operations and maintenance of stormwater and green infrastructure BMPs. Determining these needs will help a community to develop the best process to efficiently and effectively maintain municipal BMPs and develop a robust green collar workforce. Several excellent workforce development models exist throughout the region and could be adapted and replicated to other parts of the region in order to facilitate growth in the local green economy.

Meeting Goal: This forum will bring together experts to brainstorm recommendations for expanding existing models and introducing new and innovative workforce development opportunities.

10:00 a.m.	Welcome/Introductions	Ann Simonetti, Chair, LGAC Jake Reilly, Director, NFWF Chesapeake Bay Programs
10:10 a.m.	Workshop Overview/Purpose	Jennifer Starr, Director of Local Government Programs Alliance for the Chesapeake Bay
10:30 a.m.	Problem Statement Agreement	Neely Law, Director of Education and Training Center for Watershed Protection

Desired Outcome: Reach consensus on problem statement, key issues/assumptions and approach to solidifying recommendations.

11:30 a.m.	Local Needs Identification and Discussion	Jennifer Starr
12:00 p.m.	Lunch	
12:45 p.m.	Training-Case Studies	

Review models and discuss the general lessons to be learned from each:

1.	Chesapeake Bay Landscape Professional (CBLP) Certification Programs	Beth Ginter, CBLP Coordinator
2.	Blue Ridge Community & Technical College (CTC)	Cynthia Hull-Miller, Blue Ridge CTC
3.	Howard EcoWorks	Lori Lilly, Howard EcoWorks
4.	PA Dept of Conservation & Natural Resources Arboriculture Course	Shea Zwerver, PA Bureau of Forestry
5.	Clean Water Certificate Training Program	Neely Law, Center for Watershed Protection
6.	RiverCorps	Josh Burch, DC Department of Energy & Environment
1:45 p.m.	Break	
2:00 p.m.	Recommendations for Adapting and Expanding Workforce Development Programs	Kate Fritz, Executive Director Alliance for the Chesapeake Bay
4:00 p.m.	Adjourn	

Appendix D: Matrix of Programs

Program/Training	Topic Areas Addressed by Training	Targeted Employment Level			Requirements	Targeted Job	Length of Program	Program Outcome/Metric	Website Link
		Entry-Level	Incumbent Worker	Professional	Type of Credential				
Chesapeake Bay Landscape Professional Certification Level 1	Baseline credential in design, installation, and maintenance of stormwater BMPs and conservation landscaping (native plants, natural communities, habitat)		X	X	X	Candidates must have related work experience, an advanced degree or certificate, OR professional certification	Two-day training class and written exam; must complete and log 20 CEUs every two years to maintain certification	Trained: 630; Certified: 447	https://cblpro.org/
Chesapeake Bay Landscape Professional Certification Level 2	Advanced credential in design and installation of conservation landscapes, with emphasis on small-scale stormwater retrofits			X	X	Candidates must be Level 1 certified and have some experience with BMPs	Three-day intensive seminar	Trained: 77; Certified: 60	https://cblpro.org/
Chesapeake Bay Landscape Professional Certification - Associate	Introduction to green infrastructure and sustainable landscaping	X				None	Varies depending on program partner. May be delivered as part of a summer work program, or in school or camp, or other setting.	Trained: 55	https://cblpro.org/
Chesapeake Bay Landscape Professional Maintenance Crew Certificate (Pilot 2019-2020)	Focus on BMP maintenance planning and tasks					None	One-day workshop	No data available	https://cblpro.org/
Blue Ridge Community and Technical College	Environmental Science, UAS, Laboratory Technician					Community college program acceptance criteria	30 - 51 credit hours	No data available	http://www.blueridgectc.edu/
Howard EcoWorks	Stormwater and green infrastructure BMP installation & maintenance	X		X		Crew Member, Crew Leader, Foreman, Driver, Professional advancement	READY summer program: 8-10 weeks Uplift: 9-10 months Seeds of Change: 6 weeks	Issued 53 CBLP-A certificates (Uplift); 16 Certificates for Life (Seeds of Change); Hourly wage increase on average for 30% of participants; 83 prisoner days avoided at a cost savings of \$11,500	http://www.howardecoworks.org/home
PA Department of Conservation and Natural Resources Arboriculture	Arboriculture and riparian forest buffers	X				Crew Member			https://www.dcnr.pa.gov/about/pages/Forestry.aspx
Baltimore Civic Works Center for Sustainable Careers Green Training & Jobs	Brownfields remediation, residential energy efficiency, stormwater management, and solar installation	X				Crew Member	Three months, plus two weeks of on-the-job training	See CWC Level 100. Additional program metrics for other job training programs offered.	http://sustainablecareers.civicworks.com/
River Corps	Stream monitoring, invasive species management, and LID/BMP inspection and maintenance	X				Crew Member or Crew Leader	Five months		https://doee.dc.gov/
Clean Water Certificate Training Program Level 100	Introduction to the construction, maintenance and inspection of green infrastructure practices	X	X			Entry Level Stormwater Industry Employee or existing employee to develop new skillset	35 hours of combined classroom, field-based on hands on activities	Data based on program partnerships with Civic Works' BCSC: 117 enrolled with 87% completion and 95% job placement; job retention 73-92% from 6 months to 2 years; steady hourly wage increase	https://www.cwp.org/cwc/
Clean Water Certificate Training Program Level 200	Advanced skillset geared towards career advancement in the stormwater industry, or related fields of work		X	X		Professional advancement	35 hours	No data available	https://www.cwp.org/cwc/
National Green Infrastructure Certification Program	Base-level skill set needed for entry-level workers to properly construct, inspect and maintain green stormwater infrastructure	X	X			Entry Level Stormwater Industry Employee and Existing Industry Employees	Training and GI Practitioner Certification Exam (computer-based test that must be completed within a year of training)		https://ngicp.org/

Appendix E: Case Study Slides

1. Chesapeake Bay Landscape Professional (CBLP) Certification Programs Beth Ginter, CBLP Coordinator











Chesapeake Bay Landscape Professional Certification




Stormwater & Green Infrastructure Workforce Development Forum
National Conservation Training Center, Shepherdstown, WV
September 11, 2019

CBLP Programs




	Audience	Cost
CBLP Level 1	Landscape professionals	\$445
CBLP Level 2	Landscape professionals	\$580/\$630
CBLP-A (Associate)	Young people entering work force	Partner fee to establish program: \$3500 Registration: \$50 per person
Maintenance Certificate (Pilot)	Maintenance crew leaders/Crew	TBD



CBLP Program Requirements

	Entry Into Program	Requirements for Completion	Recertification
CBLP Level 1 Certification	Degree or certificate OR pro certification OR work experience	2-day class + Written exam	20 CEUs every 2 years \$150
CBLP Level 2 Certification	Level 1 certification + experience in design/installation of BMPs	3-day seminar + project + written assessment	None
CBLP-A Certificate	None	Combined passing score (quizzes, field exercises)	None
Maintenance Crew Certificate (Pilot)	None	1-day workshop + in-class quizzes	None

CBLP Program Content

Level 1 baseline credential with a focus on design, install, maintenance of stormwater practices and sustainable landscapes

Level 2 advanced credential in design, installation

CBLP-A (Associate) introduction to green infrastructure and sustainable landscaping

Program Hallmarks – We Teach:

- collaborative practice
- critical thinking
- proactive approach
- adaptive management
- unique ecology and regulatory environment of the Bay region








CBLP Classroom Experience





- Experienced Instructors
- “Flipped Classroom”
- Active Learning
- Self-Study

Level 1 Field Maintenance Practicum

- Good, Bad and Ugly
- BMP Inspection “Visual Indicators” Protocol
- Understanding Why BMPs Fail
- Simple Tools
- Guest Speakers
- Collaboration








Level 2 Intensive Seminar Content



Day 1 – Site Assessment; Soil Vegetation Protection


Day 2 – Stormwater Design & Installation

Day 3 – Natural Plant Communities

Program Outcomes/Metrics

- L1 trained: 630
- L1 certified: 447
- L2 trained/certified: 77/60
- CBLP-A: 55
- Advanced training attendees: 172



Level 1 "Hands On" Projects (2016-17)

Reductions:

Sediment – 699,104 lbs

Nitrogen –1873 lbs

Phosphorus - 1117 lbs





Beth Ginter Director, CBLP Certification Program



www.chesapeakebay.org

beth@cbcpa.org

2. Blue Ridge Community & Technical College (CTC) Cynthia Hull-Miller, Blue Ridge CTC



BlueRidge
COMMUNITY AND
TECHNICAL COLLEGE

Stormwater & Green Infrastructure Workforce Development Forum
National Conservation Training Center, Shepherdstown, WV
September 11, 2019




Environmental Science Technician Program

- 30 Credit Certificate and AAS Degree
- Two Concentrations – Environmental Science Technician and Occupational Safety
- Training students for careers with consulting services, government, and laboratories
- HS Graduates, Career Changers and those currently employed who need training
- West Virginia Invest Approved Program – little to no cost
- Advanced Grants and Learn and Earn Grants for those employed and training



Applied UAS Technologies

- Training Technicians to apply drones in everyday uses
- Prepares students for careers with consulting services, government, and private sector- construction, maintenance, and energy.
- HS Graduates, Career Changers and those currently employed who need training
- West Virginia Invest Approved Program – little to no cost
- Advanced Grants and Learn and Earn Grants for those employed and training




Applied Laboratory Tech/ Quality Assurance Techs

- Training Technicians for routine laboratory or field testing
- Prepares students for careers with consulting services, government, and manufacturing.
- HS Graduates, Career Changers and those currently employed who need training
- West Virginia Invest Approved Program – little to no cost
- Advanced Grants and Learn and Earn Grants for those employed and training




Income Potentials


- Labor Statistics 2019 – www.bls.gov
 - Environmental Technicians - \$44,000/yr.
 - Occupational Safety - \$44,000/yr.
 - UAS Technicians - \$44,380/yr.
 - Applied Laboratory Technicians /Quality Assurance Techs - \$48,000/yr.




West Virginia Employers

Learn and Earn Grants Advanced Grants






Local Government
Advisory Committee
for the Chesapeake Bay Watershed



NWFF



ALLIANCE
for the Chesapeake Bay



Applied UAS Technologies

General Education Core

- ENGL 110 – “Technical Writing & Communication (2)
- ENVY 101 – Environmental Science (3)
- GEO 101 – Geological Science (3)
- MATH 114 – “Elem Probability & Statistics (3)
- SOCL 203 – “Human Relations (3)

Applied UAS Technologies Core

- ENVY 220 – Environmental Software (3)
- ENVY 230 – Geoscience Studies (3)
- UAS 101 – Intro to Drone Applications (2)
- UAS 102 – Drone Operations I (3)
- UAS 103 – Drone Operations II (3)
- UAS 104 – Introduction to GIS (3)
- UAS 201 – Private Pilot Ground School (3)
- UAS 202 – Environmental UAS (3)
- UAS 206 – GIS for Urban Planning (3)
- UAS 230 – Aviation Meteorology (3)
- UAS 240 – Drone Imaging (3)
- UAS 250 – Drone Project Planning (3)



Environmental Science

- Elizabeth Spring
- Program Manager
- espring@blueridgectc.edu
- 304-260-4380 ext. 3421

- www.blueridgectc.edu








Education




- Cynthia Hull-Miller
- Associate Dean of Career Advancement Education
- chull@blueridgectc.edu
- 304-260-4380 ext. 2405
- www.blueridgectc.edu

3. Howard EcoWorks Lori Lilly, Howard EcoWorks


Howard EcoWorks workforce programs

Stormwater & Green Infrastructure Workforce Development Forum
National Conservation Training Center, Shepherdstown, WV
September 11, 2019

READY

A Workforce Development Program of Howard EcoWorks



- Summer workforce program for young adults (16-25)
- Construct and maintain stormwater and green infrastructure projects
- Howard County residents
- Opportunities for Crew Member, Assistant Crew Leader, Crew Leader, Materials Handler, Driver, Foreman
- 8-10 weeks in length
- ~\$120,000+ for 3 crews of 7 + support (does not include program management)
- Entry-level, no pre-requisites
- Receive CBLP-A certificates







UPLIFT

A Workforce Development Program of Howard EcoWorks




- Adult workforce program
- Targets under-served populations
- Construct and maintain stormwater and green infrastructure projects
- Howard County resident preferred
- Opportunities for Crew Member, Materials Handler, Foreman
- 9-10 months in length
- ~\$100,000+ for 1 crew of 5 (does not include program management)
- Entry-level, no pre-requisites
- Receive CBLP-A certificates

*Under-served: Individuals with criminal record, English as a second language, people who became parents as minors, learning / developmental / mental disabilities, 2nd plus generation impoverished homelessness, circumstantial economic hardships, GED/less than high school diploma adult

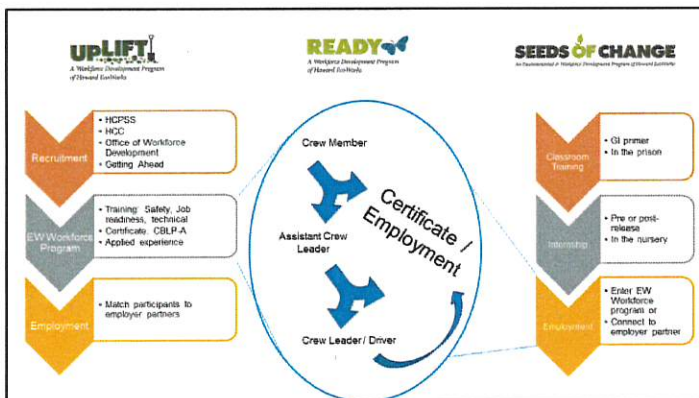




SEEDS OF CHANGE

An Environmental & Workforce Development Program of Howard EcoWorks



- Workforce program at Corrections Dept
- Maintain native plant nursery
- Opportunities for Nursery Internship
- ~6 weeks in length – 3 weeks of classroom and 3-week internship
- ~\$15,000+ for education delivery + internships
- Entry-level, no pre-requisites
- Receive Landscape for Life certificates







New Construction



Local Government Advisory Committee
for the Chesapeake Bay Executive Board

NFWF

ALLIANCE
for the Chesapeake Bay

Stream Restoration Maintenance



1850 lbs of Japanese knotweed

Local Government Advisory Committee
for the Chesapeake Bay Executive Board

NFWF

ALLIANCE
for the Chesapeake Bay

BMP Maintenance

Before



After



Local Government Advisory Committee
for the Chesapeake Bay Executive Board

NFWF

ALLIANCE
for the Chesapeake Bay

Ellicott City Debris Maintenance Program



Local Government Advisory Committee
for the Chesapeake Bay Executive Board

NFWF

ALLIANCE
for the Chesapeake Bay

Program Outcomes/Metrics

- Constructed more than 130 projects that treat ~46 acres (~14 impervious acres)
- Planted ~500 trees planted and installed 120 rain barrels
- ~80 acres of County BMP managed annually
- 53 CBLP-A certificates, 16 Landscapes for Life certificates provided
- Hourly wage increased by, on average, 30%, for participants leaving our programs
- 83 prisoner days avoided at a cost savings of \$11,500

Local Government Advisory Committee
for the Chesapeake Bay Executive Board

NFWF

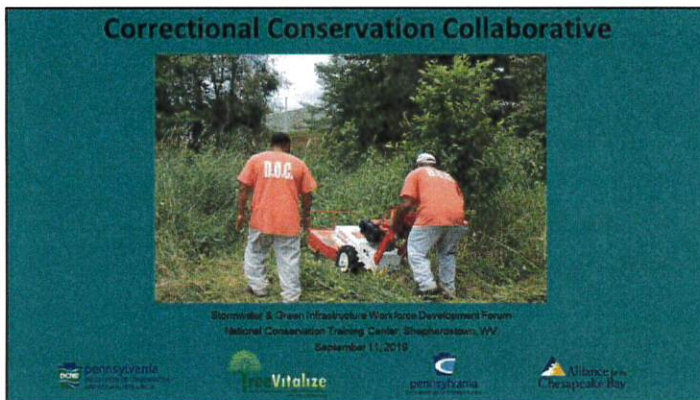
ALLIANCE
for the Chesapeake Bay




Program Contact

- Lori Lilly
- Executive Director
- lilly@howardecoworks.org
- 443-518-7666
- www.howardecoworks.org



4. PA Department of Conservation & Natural Resources Arboriculture Course Shea Zwerver, PA Bureau of Forestry










Correctional Conservation Collaborative

- Workforce Development Program in Arboriculture, Conservation and Riparian Buffers for Inmates Nearing Release
 - Target Sectors: Tree Service/Riparian Forest Buffer Sectors
 - Job/Career: Tree climber/arborist, Utility companies (line clearance), tree nursery worker, riparian forest buffer technician
 - Target Audience: Incarcerated Individuals
 - Cost/Funding: 2017-2018 = \$0 2018-2019= \$10,000 2019-2020= \$160,000

Objectives/Purpose:

- Provide employable skills to inmates nearing release for industries in high demand
- Create a workforce pipeline of skilled workers for the arboriculture and conservation sectors
- Diversify and elevate the profession
- Empower people to enter into these career pathways
- Reduce recidivism by offering correction education and getting reentrants into good-paying jobs
- Act as a model for other institutions and state agencies
- Assist with rehabilitation through nature interaction
- Elevate interdepartmental and cross-sector collaboration
- Educate those in the labor/trade sectors on environmental conservation and preservation
- Build capacity among communities
- Help PA reach Bay goals by planting RFBs on DOC properties

No Pre-requisites

- Requirements to enter the program/training: Be incarcerated at participating SCIs
- Requirements to earn certificate/certification: Opportunities to take Pesticide Applicators Certification and Tree Worker Climber Specialist





Program Content

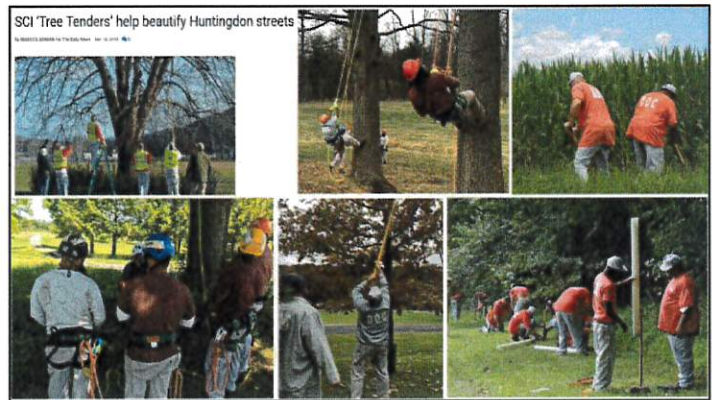
Arboriculture Program & Tree Tenders

Benefits of Trees & Urban Forestry
Tree Biology
Trees & Soil Relations
Water Management
Tree Nutrition & Fertilization
Tree Identification
Diagnosis and Identification of Tree Pests and Diseases
Tree Pruning and ANSI standards
Tree Installation, Establishment and Preservation
Tree Worker Safety
Tree Cabling, Bracing and Lightning Protection
Tree Risk Assessment
Tree Selection
Tree Climbing

Instructors from: Bureau of Forestry, Penn State University, Penn State Extension, DE Forestry Service, Barlett Tree Experts, Conservation Services Inc., NRCS, County Conservation Districts, Native Creations

Riparian Forest Buffer Program

Farming 101
Stream Ecology & Aquatic Macroinvertebrates
Plant Identification
Tree Planting: Planting & Sheltering Techniques
Plant Selection
RFB Design
Site Maintenance
Pesticide Application
Small Business Basics & Entrepreneurship
Professionalism & Career Day





Program Outcomes/Metrics

Reach: 172 Inmates
 2 State Correctional Institutions
 10 Programs
 343 hours of class & field instruction
 Percentage of those released: TBD
 Know of: 3 in job placement: 3 seriously interested

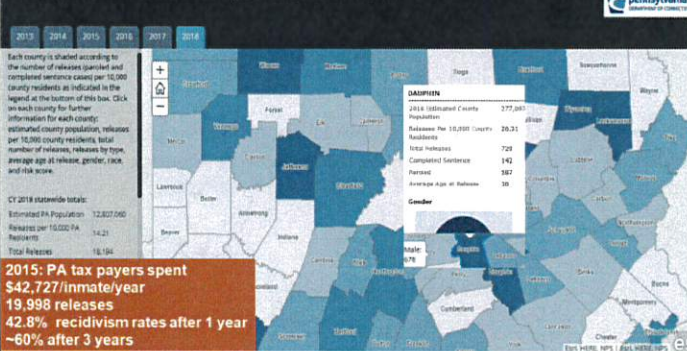
Ranking	County	Rate 2016
1	Jefferson	932.5
2	Philadelphia	865.9
★ 3	Dauphin	685.8
★ 4	Fulton	669.4
★ 5	Lycoming	622.1
6	Venango	570.5
7	Fayette	568.8
★ 8	Wyoming	494.2
★ 9	Lackawanna	487.9
10	Warren	484.7

* Ranking by incarceration rate per 100,000 residents. Note: incarceration rate per 100,000 residents. This rate does not include county or federal inmates.

- 52% of Total Court Commitments in 2016 were between the ages 25-39
- Highest Offenses: Narcotic Drug Laws, Theft/Larceny, Weapons, Other

PA Department of Corrections Calendar Year Releases

Please email any comments or feedback to PA-DCNR@PA-DCNR.gov For a map of PA DOC Admissions click here



Program Contact

Shea Zwerver, PA DCNR Bureau of Forestry/WPC, TreeVitalize Coordinator
c-zwerver@pa.gov, 717.346.9583

Ryan Davis, Alliance for the Chesapeake Bay, Chesapeake Forests Program Manager
rdavis@allianceforthebay.org, 717.517.8698

Teddi Stark, PA DCNR Bureau of Forestry/WPC, Riparian Forest Buffer Coordinator
c-tstark@pa.gov, 717.787.0656

5. Clean Water Certificate Training Program Neely Law, Center for Watershed Protection







CLEAN WATER CERTIFICATE (CWC) TRAINING PROGRAM FOR WORKFORCE DEVELOPMENT

Stormwater & Green Infrastructure workforce development
September 11, 2019
Shepherdstown, WV at The National Conservation Training Center

Funding for the program provided by the generous support of the
Keith Campbell Foundation, Prince Charitable Trusts and France-Merrick Foundation











PROGRAM DESIGN













PURPOSE

- Provide the stormwater industry access to an "on the job ready" workforce
- Expand the skilled stormwater industry workforce to help meet the demand for stormwater installation and maintenance
- Increase the opportunities for individuals in low-income communities, under- or unemployed individuals to secure a living wage job leading to financial stability




TARGET AUDIENCE & PRE-REQUISITES

Target Audience:

- Under- and unemployed adults in the 18-24 years of age demographic seeking to re-enter or enter the workforce.
- Existing workforce, new to the stormwater industry, or with a desire to move into the stormwater industry employment sector.


Pre-Requisites:

- Participants enrolled or participating in a workforce development program, or currently employed and recommended for program by employer
- Demonstrated ability to physically perform the work through pre-screening or through existing employer

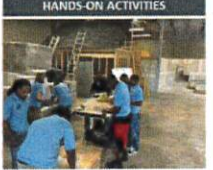


CURRICULUM


CLASSROOM






HANDS-ON ACTIVITIES




FIELD-BASED






- 35-hrs
- 100% Attendance
- Pass Competency Assessments



PROGRAM CONTENT

- 5 Modules
 - Introduction to Stormwater Management
 - Stormwater Best Management Practices (BMPs) Types and Functions
 - Components and Materials
 - Construction and Equipment
 - Maintenance
- Each cohort 8-10 participants for high Instructor-Trainee ratio
- Classroom, hands-on and field-based training

CWC PROGRAM OUTCOMES / METRICS

- Pilot 2017
- 2018 Full Program implementation
- Total Certificates Issued: 33
 - Workforce development: 27
 - Exiting/Incumbant workforce: 6
- Total Job Placement WFD: 75%








CIVIC WORKS' CENTER FOR SUSTAINABLE CAREERS (CSC)






- CSC offers 4 Technical Training Programs
 - Solar Installation
 - Energy Retrofit
 - Brownfields
 - Stormwater Management




CSC PROGRAM STRUCTURE

- Classroom and hands-on training (6 – 8 weeks)
 - Covers job readiness, OSHA construction safety, and industry-specific technical skills
- On-the-job training (3 to 12 weeks)
 - Builds experience working on real industry projects in a supportive environment
- Wraparound case management services (enrollment and post-placement)
 - Covers the areas of transportation, financial, housing, health, legal, benefits, etc)
- Direct job placement
- Retention support (2 years post-placement)




PRE-REQUISITES

- Enrollment criteria
 - Drive, motivation, and commitment to the career field
- Requirements to earn certificate/certification
 - Written and hands-on competency assessments
 - Punctuality and attendance
 - Participation and communication
- Ongoing requirements to maintain certifications
 - Some industry credentials require regular refreshers and/or exams

CSC OUTCOMES/METRICS

2018 Outcomes	2015 – 2018 Retention	Wages
▪ Enrollment: 117	▪ Retention at 6 months: 73%	▪ Wages at Placement: \$15.57
▪ Completion: 86%	▪ Retention at Year 1: 83%	▪ Wages at 6 months: \$16.06
▪ Placement: 94%	▪ Retention at Year 2: 92%	▪ Wages at Year 1: \$16.56
		▪ Wages at Year 2: \$17.58

CWC CONTACT INFORMATION

Neely Law	Eli Allen	Wellington Bruce Ashe
Director of Education & Training	Director	Associate Director
Center for Watershed Protection	Baltimore Center for Sustainable Careers	Baltimore Center for Sustainable Careers
nll@cwv.org	eallen@civicworks.com	washe@civicworks.com
410-461-8323 ext 3216	(410) 929-6135	(410) 929-6136
http://www.cwp.org/cwc		http://sustainablecareers.civicworks.com/




6. RiverCorps

Josh Burch, DC Department of Energy & Environment





Stormwater & Green Infrastructure Workforce Development Forum
National Conservation Training Center, Shepherdstown, WV
September 11, 2019







River Corps




- 5 month long Green Infrastructure Job Training Program
 - To equip young people in D.C. with the skills and knowledge to
 - Targeted Green Infrastructure Sector (stormwater, energy etc) & job /career
 - DC Young People Ages 18-24
 - \$400,000/year
 - Grantee: Latin American Youth Center














Program Outcomes/Metrics

Annual Programmatic Outcomes: <ul style="list-style-type: none">• 10 Streams Photo Monitored• Invasive Plant Removal• Trash Removal• 25 Bioretention Cells Maintained• 70 RiverSmart Homes Inspections• OSHA 10 & CPR• One acre of native plants	Youth Outcomes: <ul style="list-style-type: none">• 20 Graduates per year• OSHA 10 & CPR• Capstone Projects• Employment & Educational Progress
---	--



Program Contacts

<ul style="list-style-type: none">• Jacob Newman• Managing Director• newman@layc-dc.org• 401.218.0784	<ul style="list-style-type: none">• Josh Burch• Environmental Protection Specialist• josh.burch@dc.gov• 202.734.9527
--	--

Appendix F: Selection of Workforce Development Resources

- EPA Webinar: Growing New Jobs with Green Infrastructure <https://www.epa.gov/green-infrastructure/growing-new-jobs-green-infrastructure>
- Urban Waters Learning Network Webinar: Training a GI Workforce <https://www.rivernetwork.org/resource/webinar-gi-workforce-development/>
- Sustainable Landscapes Certification Manual PA Landscape & Nursery Association <https://www.plna.com/store/ViewProduct.aspx?id=2162652>
- Urban Waters Learning Network reports
 - Jobs and Equity in the Urban Forest <http://www.urbanwaterslearningnetwork.org/resources/jobs-and-equity-in-the-urban-forest-apr-2019/>
 - Exploring the Green Infrastructure Workforce http://www.urbanwaterslearningnetwork.org/wp-content/uploads/2017/06/Natureworks_GIWorkforce_Spring2017.pdf
 - Sustainable Models for Green Infrastructure Maintenance <http://www.urbanwaterslearningnetwork.org/wp-content/uploads/2017/10/Great-Lakes-Sustainable-Models-for-GI-Maintenance-Final-Report-05232016.pdf>
- American Rivers report: Staying Green and Growing Jobs <http://www.americanrivers.org/wp-content/uploads/2016/05/staying-green-and-growing-jobs.pdf>
- Stormwater PA Case Study: Healthy Urban Waters: Empowering People, Improving Communities, Creating Jobs <http://stormwaterpa.org/healthy-urban-waters.html>
- Harvard Law School: Certifications for Green Infrastructure Professionals: The Current State, Recommended Best Practices, and What Governments Can Do to Help <http://eelp.law.harvard.edu/wp-content/uploads/certifications-green-infrastructure-professionals.pdf>
- Pacific Institute report: Water Works-Rebuilding Infrastructure Creating Jobs Greening the Environments https://pacinst.org/wp-content/uploads/2013/02/water_works3.pdf
- GSI Partners: Capturing the Storm: Profits, Jobs, and Training in Philadelphia's Stormwater Industry <https://gsipartners.sbnphiladelphia.org/wp-content/uploads/2018/10/Capturing-the-Storm-2010.pdf>
- National Green Infrastructure Certification Program <https://ngicp.org/>
- Bridging the Gap (Kansas City, MO) <https://bridgingthegap.org/green-infrastructure-management/>
- Green Infrastructure and Resilience Institute <https://www.southface.org/programs/giri/>
- Jobs for the Future <https://www.jff.org/>

Appendix G. Needs Assessment Example

(Provided by Cynthia Hull, Blue Ridge Community and Technical College)

Labor statistics are a common source of information to support a needs assessment in addition to other databases and employer surveys. In general, the basic information for a needs assessment are the wages for the jobs for which training, course or program is developed along with the existing and projected employment growth for the industry or field of work. The information available for each jurisdiction may vary. There is no formal industry classification of stormwater management jobs, and professional qualifications for workers in this industry. The stormwater industry workforce is a hybrid of traditional occupations; a stormwater industry employer SIC does not exist. This presents a challenge to characterize this industry's workforce effectively. Relevant job classifications for entry-level stormwater industry positions are laborers, but they may encompass a wide range of jobs to include for example: landscaping, excavation, pipelaying, pavement installation, etc. The majority of the occupations require no job experience, nor any formal educational credentials, nor a high school diploma.

A summary of information prepared by Blue Ridge Community and Technical College for a new program is provided below. An example set of questions are provided below. Briefly describe the project for which funds are being requested.

- What are the goals and objectives of the program? (Please include the specific business sector, training needs, and the documented job market demand for the program/training)
- Of the participants trained during the grant period, what is the job placement rate, wages and benefits expected upon completion of the program?
- Provide a detailed work plan that would allow someone to gauge the progress of the program.

Data Sources Available in West Virginia

Pay, Educational requirements, Job Outlook, Job descriptions

Bureau of Labor Statistics, Occupational Handbook, www.bls.gov

Mean, Entry, Experienced and Median Wage

Workforce West Virginia, Occupational Wages, <http://lmi.workforcewv.org/occproj/occupationalwagesqtrly.html>

