

Green Infrastructure Initiative at the Atlanta University Center
Final Report
Environmental Community Action Inc. (ECO-Action)
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1.0 Project Background

Green infrastructure provides an interconnected network of open spaces and natural areas, such as greenways, wetlands, parks, forest preserves and native plant vegetation that naturally manage stormwater, reduce flooding risk, and improve water quality.¹ The 2011 report, *Proctor Creek North Avenue Watershed Basin, A Green Infrastructure Vision (PNA Vision)*, proposed green infrastructure elements as part of conceptual level designs for English Avenue, Vine City, and Washington Park, low-lying residential neighborhoods that have been subject to consistent storm water and combined sewage flooding. The designs were developed with extensive resident involvement and outreach.

However, the study was able to direct its limited resources to only these three low elevation neighborhoods. Green infrastructure solutions for the Atlanta University Consortium (AUC), which dominates the high-elevation southern headwaters of the Proctor Creek North Avenue watershed, were not identified. Partners who developed the PNA vision have said repeatedly that the solutions they identified for the lower elevations will be ineffective without reducing the flows from the higher elevations.

Through the *Green Infrastructure at the Atlanta University Center Initiative*, Environmental Community Action (ECO-Action) and its partners planned to create a comprehensive "Vision for Action" to reduce flooding and improve water quality in Proctor Creek to revitalize adjacent low-income neighborhoods. The project also intended to engage students as environmental and sustainability ambassadors to broaden support for the restoration of Proctor Creek and to prepare them to engage in other urban water efforts beyond the duration of this project.

1.1 Planned Activities

The project brought academics together with leaders of underserved communities to better understand the extent and impact of sewage and stormwater flows from the high elevation AUC campuses on the downstream residential communities. Core activities of the project were:

- Work with AUC faculty to incorporate green infrastructure principles and practices, and water quality issues specific to Proctor Creek into engineering/college courses.
- Collaborative community and academic field work to explore and document downstream issues through service learning activities.
- Students' preparation of conceptual plans that describe approaches to capture the 22.4MG of stormwater generated on the campuses.

¹ "What Is Green Infrastructure?: Center for Neighborhood Technology.", Web. 1 Dec. 2012.

- Presentation of service learning and conceptual design processes and outcomes at three community forums and a public conference, *Green Infrastructure, Visioning for Action* involving campus students, staff and faculty, residents of downstream communities, non profit organizations, corporations, and Federal, State, County and City governments

The tasks completed as well as the team’s achievements are highlighted in Section 2 of this document, “Actual Project Activities and Achievements.”

1.2 Project Objectives

Through these activities, the project was planned to achieve the following major objectives of the Urban Waters Small Grant Program:

1. Address local urban water quality issues;
2. Engage, educate and empower;
3. Involve underserved communities; and
4. Support community priorities.

Reflections on the team’s progress toward achieving these short and long term objectives are discussed in Section 4 of this document, Achievements, Reflections and Path Forward.

1.3 Partners

Environmental Community Action Inc. (ECO-Action), the lead organization for this project convened the project’s core team that consisted of Clark Atlanta University (CAU), West Atlanta Watershed Alliance (WAWA), Metropolitan Atlanta Urban Watershed Institute (MAUWI), Community Improvement Association (CIA), the Proctor Creek Stewardship Council, Park Pride and Eberly and Associates. As the project progressed, additional institutions and organizations were engaged both in the delivery of the project and in planning for the project’s next steps. They include Spelman College, Interdenominational Theological Center, The Conservation Fund, Atlanta Housing Authority, AUC ECO-district, Georgia State University, Emory University, and others. These organizations’ contributions will be further described in subsequent sections of this report.

2.0 Actual Project Activities and Achievements

Over the last two years, the team has engaged AUC students, faculty and staff in a wide range of project activities that have promoted awareness of green infrastructure as a sustainable solution to the stormwater issues. Project activities and achievements in the four major task areas: coursework, service learning, conceptual plans, community forums and Green Infrastructure Conference are described below.

2.1. Coursework

Planned Measure of Effectiveness: Elements detailed in a Green Infrastructure Curriculum Outline will be incorporated into seven college-level classes. 60 students will participate in specifically adapted engineering coursework.

Actual Achievements

The first draft of a curriculum guide was completed in October 2014. Following a comprehensive review of another guide prepared by the Green Infrastructure Center of Charlottesville, VA and other curriculum materials, the guide was updated in January 2015.

Materials were incorporated into Biology, Environmental Engineering (Engineering Design and Engineering Graphics), Environmental Health, Marketing and Sustainable Development classes and presented to over 240 students as detailed below:

- October 16, 2014: Walt Ray, Park Pride presented a green infrastructure training session to Environmental Engineering classes. (Engineering Design and Engineering Graphics were combined) 23 students participated.
- November, 2014: Bill Eisenhauer of MAUWI and Greg Delaney of Eberly Associates Inc. made presentations on Green Infrastructure and process of conceptual development to capture stormwater at the AUC campuses to 15 CAU engineering students.
- December 2014: Two student presentations on green infrastructure were made for a CAU Environmental Engineering class. 15 students participated in the class session.



- January 2015: Presentation on green infrastructure to 41 students CAU Marketing students.
- July 2015: Dr. Yomi made three presentations to 57 CAU students in the schools of Business Administration and Education during the summer semester.

- September 8 and 10, 2015: Dr. Yomi presented green infrastructure concepts and principles at two Environmental Engineering class sessions. Students were invited to participate in Service Learning and Conceptual Design activities. Six students participated.
- October 5 and October 8, 2015: Dr. Yomi presented green infrastructure concepts and principles to freshman and senior biology classes at CAU. Students were invited to participate in Service Learning and Conceptual Design activities. Thirteen seniors and 37 freshmen participated.
- January, 2016, and multiple sessions April 2016: Dr. Yomi presented green infrastructure information at Engineering Design (15 students) and Engineering Graphics (16 students) classes.
- April 6 and 7, 2016: Dr. Yomi presented green infrastructure information to freshman and senior biology classes. Thirteen (13) seniors and Twenty six (26) freshmen participated.

Discussion: The actual achievements exceeded the planned measure of effectiveness. According to Professor Olatidoye of CAU Dual engineering program, *“The initiative allows for the Engineering courses impacted to be an extension of a Living Learning Laboratory for students at AUC, where the Proctor Creek project now serves as a hands-on learning opportunity for them and allows them to be part of the solutions that will impact our Community”*.

This green infrastructure learning exchange provided an opportunity for students, faculty and community members to understand Green Infrastructure and its benefits to reduce stormwater runoff and improve livability of the downstream communities. Amirah Michell, a Spelman College student put it this way, *“Green infrastructure is the natural security for stormwater management”*.

2.2. Service Learning

Planned Measure of Effectiveness: 50 students will participate in 16 service learning projects

Actual Achievements: Presentations about green infrastructure service learning opportunities were made to 60 members of environmental/green student organizations. Approximately 51 students participated in 6 service learning projects as further detailed below:

- Students participated in the Eco-District Forum hosted by Spelman College with the EPA Region IV Director as the Guest Speaker on September 16, 2014. Approximately 15 students participated.
- About 20 Spelman and CAU students learned and worked with experts in testing water quality at the west Atlanta, Grove Park Recreation Center with ECO-Action partners WAWA, the Chattahoochee Riverkeeper, Proctor Creek Stewardship Council and Georgia Adopt a stream.

- On November 22, 2014 Spelman College service learning group worked on a project to identify pervious and impervious areas, flow routes, low points for location of GI elements on AUC campuses between March and May 2015. Members of this four-student group later worked on one of the Conceptual Design projects.



- At the second Community Forum held on November 14, 2015, community and student partners were identified for three additional Service Learning projects. These projects were the Proctor Creek Learning Exchange, Workforce Development for green infrastructure and Advancing Proctor Creek Conceptual planning. Action plans were created for each of these projects.

- Initial meetings with the Interdenominational Theological Center (ITC) to set the agenda for a Green Infrastructure Learning project occurred in October 2015. At the second Community Forum, community partners were identified for this Service Learning project and an Action Plan was developed. Eight meetings were held between February and May 2016 to organize the project. Ten students from the ITC and other AUC colleges are involved in the project in addition to ITC staff and faculty and community members.

- In cooperation with Dr. Nirajan Dhakal, Spelman College, Environmental and Health Sciences Program, six students conducted research and presented papers discussing water and infrastructure. Three of the presentations addressed green infrastructure specifically. The materials were presented at the annual Spelman Research Day in April 2016. Over 500 students, faculty and residents visited the Spelman presentations. Paper presentations were made by Spelman students including:

- “Is the water that we drink in Atlanta compromised?” Presenters: Enlylh King, Qasimah Alexis Lang, Jade Bowles
- “Assessment of the relation between Water Quality and Water Quantity for Proctor Creek, GA.” Presenter: Alexandra Price
- “Economics of Extreme Weather Events: The effects of increased rainfall in Georgia.” Presenter: Madeline Miller

- “GIS Analysis of Water Quality in Southwest Atlanta.” Presenters: Tamara Spikes, Sydney Hubbert, Kayla Hunter
- “Green infrastructure for a Sustainable Atlanta.” Presenter: Imani Love
- Between March 30 and April 3, 2016, findings of student-conducted research efforts were presented at the Historically Black Colleges and Universities (HBCUs) Climate Change Conference held in New Orleans, Louisiana. Over 1000 students from HBCUs were exposed to the presentations in New Orleans. The Spelman College presentation was made by Sydney Hubbert, one of our students working on green infrastructure in conjunction with her two Spelman professors.
 - Sydney Hubbert, Dr. Fatemeh Shafiei and Dr. Nirajan Dhakal, 2016. “Atlanta University Center “Students Solving Storm Water Management in West End, Atlanta Using Green Infrastructure.” 4th Annual HBCU Climate Change Conference, New Orleans, LA
- Green Infrastructure Presentations to clubs and college classes:
 - Presentations to CAU Green Living Club on October 14, 2014, January 26, 2016, March 8, 2016, March 25, 2016. Between 18 and 20 students were present at each session.
 - Mobilization of members of CAU Living Green Club in community cleanup on February 27, 2016 and March 26, 2016. The intention was to remove trash that would otherwise contaminate Proctor Creek, when it was swept up in stormwater flows.
 - Presentations to Spelman College, Student Environmental Task Force on February 2015, February 24, 2016, March 30, 2016. Presentation topics included toxic chemicals, non-point source pollution of stormwater by toxic chemicals, and green infrastructure. Between 5 and 7 students were present at each session. Environmental Task Force members later shared what they had learned with other students at campus “Market Thursday” events.
 - Invitation to Spelman College, Environmental Health students to participate in service learning projects, February 9, 2015; thirteen students were present.
 - Invitation to Spelman College students to participate in service learning projects during March 3, 2015 project presentation during Sustainable Development class; twenty-two students were present.

Discussion: The number of students reached was greater than that identified by the planned measure of effectiveness.

2.3. Conceptual Plans

Planned Measure of Effectiveness: Twenty seven (27) students will participate in the development of 9 conceptual plans.

Actual Achievements: Twenty seven (27) students participated in research into the uses and effectiveness of green infrastructure and 12 students participated in development of nine conceptual plans for capturing stormwater runoff from the AUC campuses.

2.3.1 Preparation for Conceptual Plan Work

- Greg Delaney, Eberly and Associates Inc. and Bill Eisenhauer, MAUWI met with Professor Olatidoye, CAU and five environmental engineering students to discuss conceptual planning.
- In the spring of 2015, Students from CAU’s engineering classes created green infrastructure Poster Projects in preparation for the conceptual design effort. After reviewing the preliminary presentations with the students and making suggestions for project improvement, Dr. Yomi and Bill Eisenhauer evaluated the final presentations of the six student teams in April 2015.
- Because ITC provides graduate level training for divinity students, ECO-Action staff developed a sample Conceptual Design for ITC campus during July and August 2015. Selected stormwater retention features were reviewed and modified by ITC and Spelman College students during the spring of 2016.
- In partnership with representatives from WAWA, Georgia State University, and the City of Atlanta, students worked to improve elevation and sewer line mapping for all of Subwatershed A including the AUC campuses during the fall of 2015.
- In December 2015, students from CAU engineering classes created green infrastructure Poster Projects in preparation for the conceptual plan effort. After reviewing the preliminary presentations with the students and making suggestions for project improvement, Dr. Yomi, Bill Eisenhauer and Lynne Young evaluated the six students’ final presentations.

2.3.2 Conceptual Planning

From September to November 2015, Spelman College students developed a Conceptual Plan for the Spelman College campus. Outreach to Dr. Nirajan Dhakal and Art Frazier (both at Spelman) and Greg Delaney (Eberly and Associates, Inc.) was requested for assistance on slope, flow and depth issues related to the Spelman Creek ephemeral stream concept. Expansive support was provided to students to assist in the preparation of calculations, report structure, rain event storm information, edits and final report presentation. Students produced a final report and PowerPoint presentation summarizing the basis of the plan.

Between January and June 2016, student groups worked to complete conceptual plans at CAU, ITC, Morris Brown, Atlanta Housing Authority sites. Presentations of their work were made at the Green Infrastructure Conference.

- A team of two Spelman College students, Imani Love and Sydney Hubbert developed the conceptual plan for Spelman College

- A team of students called for adding 5 million gallons of flood control capacity to an initial Sunset Avenue Greenway conceptual plan developed primarily by Park Pride and Conservation Fund. The team included Sydney Hubbert, Spelman College; Sederra Ross, CAU; Meron Aberha, Morehouse College; Imani Love, Spelman College; and Matthew Ramsay, Morehouse College
- A team of two CAU students, Meron Aberha and Sederra Ross, developed the Conceptual Plan for Catchment Area 1
- Spelman College student, Sydney Hubbert in collaboration with two ITC students and others (Stella Russell, Dr. Charles Thomas) developed three Conceptual Plans for Catchment Area 2
- A multi-college team made up of Crystal Williams, Spelman College, and Alaron Hubbert and Justin Whitt, Morehouse College developed the Conceptual Plan for Catchment Area 3
- A Spelman College/Morehouse College student team (Krista Montgomery, Emanuel Russom) developed the Conceptual Plan for Catchment Area 4
- A Spelman College/Morehouse College student team (Imani Love, Matthew Ramsay) developed the Conceptual Plan for the AHA property.

Description of the Plan Areas and Total Flows Captured

Initially intending to capture 22.4 million gallons (MG) of stormwater from the campuses, the planning process recognized the need to also include the private and public/private properties that are uphill from the AUC campuses and drain stormwater into the campus sewer systems. The nine final conceptual plans capture 40.0 MG of stormwater runoff from this enlarged 289 acres study area. Some 17.1 MG is retained for reuse in cisterns while 22.9 MG is detained in greenways and vaults for release after the major rain events have passed. Quantities of stormwater retained, detained and captured in each of the seven areas studied are summarized in Table 1 below.

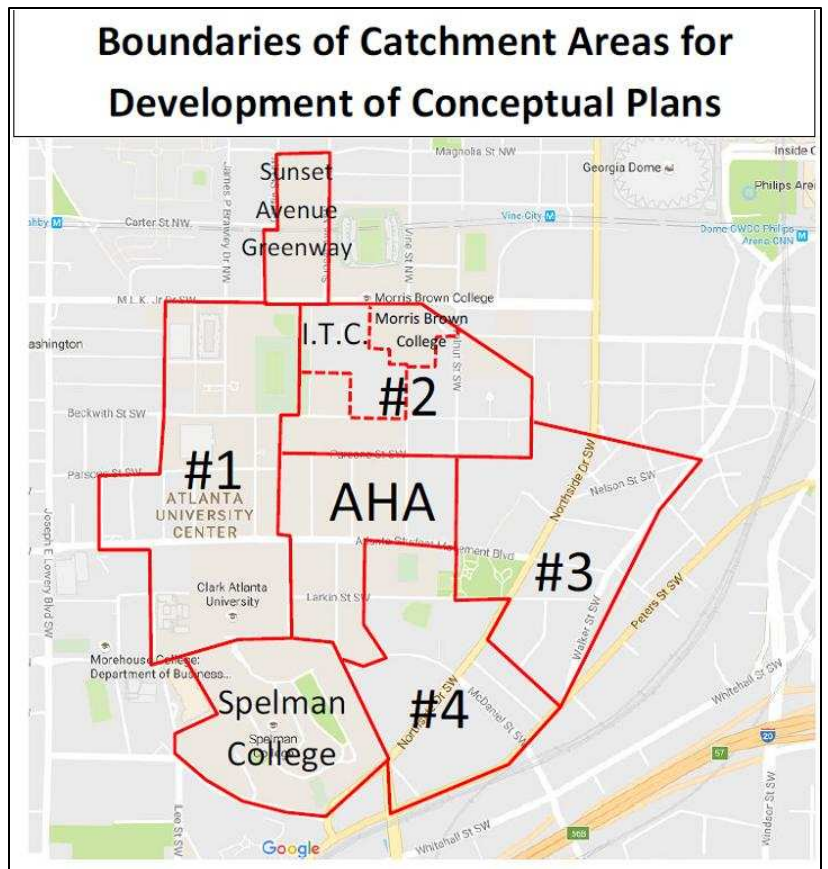
Table 1: Stormwater Retained, Detained and Captured

Area	Stormwater Retention	Stormwater Detention	Total Floodwaters Captured
Spelman College	1.4 MG	1.9 MG + 1.3 MG = 3.2 MG	4.6 MG
Sunset Avenue Greenway		5.0 MG	5.0 MG
Catchment # 1	4.2 MG	3.8 MG	8.0 MG
Catchment # 2 includes 3 Conceptual Plans	2.3 MG	1.7 MG	4.0 MG

Area	Stormwater Retention	Stormwater Detention	Total Floodwaters Captured
Catchment # 3	4.3 MG	4.9 MG	9.2 MG
Catchment # 4	3.1 MG	1.9 MG	5.0 MG
Atlanta Housing Authority	1.8 MG	2.4 MG	4.2 MG
Total	17.1 MG	22.9 MG	40.0 MG

A description of each of the plan areas appears below. Reports on the nine conceptual plans can be found on the ECO-Action website (www.eco-act.org).

- Spelman College Green Infrastructure Conceptual Plan** considered the southernmost part of the study area. It can capture 4.6 MG of flood waters, 1.4 MG in cisterns, 1.9 MG in the Spelman Parking Lot Underground Detention Vault, and 1.3 MG in terraced flood plains (Spelman Meadows).
- Sunset Avenue Greenway Catchment Area** on the historic Morris Brown College Campus is identified in several of the AUC Conceptual Plans as a significant opportunity to detain, infiltrate and clean stormwater from the AUC campuses before it impacts local neighborhoods. Extending along Sunset Avenue north of Martin Luther King, Jr. Drive to Magnolia Street, the property is adjacent to Herndon Stadium on the Morris Brown Campus. It can capture and detain 5 MG of stormwater runoff during a major rain event. It can also infiltrate 500,000 to 1,200,000 gallons of runoff per year.
- Catchment Area 1** embraces the western part of the CAU campus plus parts of the surrounding community all located between Lawshe Street and Lowery Boulevard. It captures 8.0 MG of floodwaters, 4.2 MG in cisterns and 3.8 MG in recreational greenways.
- Catchment Area 2** brings together three adjoining Conceptual Plans for the Interdenominational



Theological Center, the high elevation portion of the historic Morris Brown campus, and contiguous parts of the CAU campus, as well as private and public/private areas uphill from the campuses. It extends along the northern edge of the study area. It captures 4.0 MG of floodwater, 2.3 MG in cisterns and 1.7 MG in greenways.

- **Catchment Area 3** is central in the eastern side of the study area. Some 2/3 of the Catchment is located outside of the boundaries of AUC, starting as high up in elevation as Walker Street in Castleberry Hill. Rainwater from these portions of the Catchment drops 60 feet in elevation to flood the lower elevations at CAU and the Atlanta Housing Authority (AHA) at John Hope Drive and Lawshe Street. Green infrastructure in this Conceptual Plan will capture 9.2 MG of floodwaters, 4.3 MG in cisterns and 4.9 MG in greenways.
- **Catchment Area 4** takes in the southeastern portion of the study area. As much as 2/3 of this Catchment is public/private apartment development starting at the high elevations of Peters Street which drains down to and floods the parking lot behind the CAU Gym. This Conceptual Plan captures 5.0 MG of floodwaters, 3.1 MG in cisterns and 1.9 MG in greenways.
- **Atlanta Housing Authority Catchment Area**, a Multifamily Housing Plan called Scholars Landing is located at one of the lowest elevation areas of the CAU campus. Its EPA wetness index of “usually wet” can be mitigated by the green infrastructure Conceptual Plans for the surrounding Catchments # 1, # 2, # 3 and # 4. In addition, the Conceptual Plan for the AHA Catchment itself calls for the capture of 4.2 MG of floodwaters, 1.8 MG in cisterns and 2.4 MG in greenways.

Student Observations and Recommendations

Early in their research, students documented the adverse effects that combined sewage – stormwater mixed with raw sewage – flooding downhill from the AUC campuses had on public health in the lower elevation residential communities and on water quality in Proctor Creek. They took it as a moral responsibility to develop capacity relief for the combined sewer system in order to reduce the adverse impacts flooding from the AUC campuses has on public health in downstream communities.

In line with the notion that nature can help make cities healthier, more resilient and more appealing places to live, the students also recognized that introducing stormwater storage greenways to the AUC campuses could improve aesthetics and provide passive recreation opportunities and play spaces. One conceptual plan notes that “running water releases negative ions into its surroundings which mediate mood and improve creativity...” Other research says that walking in nature changes brain chemistry in a positive way, in such a way as to reduce violence and improve attitude”.

Students recommended that their conceptual plans be considered for implementation over a period of time not only to improve livability at AUC, but also to ensure improved living conditions for all affected downstream communities. Additional long-term benefits the students expect include increased systems resiliency, cleaner air and water, collection of water for reuse and for drought relief and other purposes, and a way to lessen the impact of climate change.

The students noted that the implementation of their conceptual plans will require that someone nurture collaboration and cooperation among the private and public stakeholders. Once the stakeholders agree to move forward, more complex hydrological analysis will be necessary along with cost/benefit analyses.

They also note that the third world situation in Proctor Creek has led to a convergence of both federal and local stakeholders to investigate the causal problems and implement flood control solutions. The Department of Housing and Urban Development, the Army Corps of Engineers and the Environmental Protection Agency, among 16 federal agencies, have joined forces with the City of Atlanta, corporations, charitable foundations, and non-governmental organizations to fix this problem.

They further note that the cost of eliminating CSOs and SSOs throughout the nation is staggering. The wastewater systems of the United States are aging and require significant investment in traditional infrastructure and innovative, non-structural infrastructure to prevent the occurrence of sewer overflows. In its most recent Clean Water Needs Survey (2000), EPA estimated the future capital needs to address existing CSOs at \$50.6 billion. In addition, EPA estimated that it would require an additional \$88.5 billion in capital improvements to reduce the frequency of SSOs caused by wet weather and other conditions (e.g., blockages, line breaks and mechanical/power failures).

Discussion: The targeted nine (9) conceptual plans were developed. Students who were engaged in this project claimed to have gained an increased understanding of green infrastructure and its application to capturing stormwater, engineering concepts, design processes, and the importance of moral responsibility.

In her written reflection statement Imani Love, Spelman student (May 2016 graduate) wrote, *“Thinking back to when I was first introduced to green infrastructure in Dr. Yomi’s Environmental Health class my junior year at Spelman College, I never would have thought how much this project would impact my personal and academic career. Since 2015 I have immersed myself in two projects that have not only extended my knowledge of environmental health and green infrastructure, but the importance of sustainability environmentally and culturally in the West End. I learned the importance of giving back to the community that essentially assisted me in becoming the environmental advocate that I am today. In every phone interview and conversation that I engage in regarding my career and academic achievements thus far, the*

green infrastructure project is at the top of the list. There a number of skills and personal relationships that I developed while working on this project. ...Completing this project has provided me with irreplaceable experiences and I am forever grateful”.

2.4. Community Forums

Planned Measure of Effectiveness: Three forums will be organized for the AUC community and surrounding neighborhoods. Fifteen student presentations will be made for 100 attendees at each forum;

Actual Achievements: Three forums were held for the AUC community and surrounding neighborhoods. These forums included four student presentations. Approximately 170 persons attended the three forums.

2.4.1 Community Forum No. 1

The Forum was held on March 17, 2015 at Spelman College. The focus of this first forum was to increase awareness of green infrastructure in both academic and downstream communities. The forum was declared opened by Mr. James Gaittina, Director, Water Protection, EPA Region IV. The forum included a green infrastructure panel: Moderator – Mr. Walt Ray, Director of Visioning, Park Pride, Mr. Michael Mitchell, Senior Scientist, EPA Region IV, Mr. Tony Torrence, President, Community Improvement Association, Ms. Pamela Flores, CEO, HELP.ORG, Mr. Cory Rayburn, City of Atlanta, Watershed Protection, and Ms. Shannon Lee, Conservation Associate, The Conservation Fund. Additional presenters were Mr. James Gaittina, Director, Water Protection, EPA Region IV, Hon Mable Thomas, Georgia State Representative and Michael May of the Chattahoochee Riverkeeper.

Student presentations were made by Ms. Ruth Wangia, Spelman College, Ogechi Irondi, CAU and Sederra Ross, CAU, (3 student presentations). A student initiative that was highlighted in one of the presentations proposed the construction of sustainability and recycling center on the CAU campus. Better collection of trash and recyclables on the AUC campuses would reduce the solid waste load that ultimately ends up in Proctor Creek and ultimately improve its water quality.

Attendees developed 4 draft actions plans. There were 79 forum attendees of whom 22 were students, 6 were staff, 29 were community members and 22 were interested parties. In spring of 2016, one of the student presenters, Ogechi Irondi, became a water fellow with the Chattahoochee Riverkeeper organization.

2.4.2 Community Forum No. 2

Forum 2 was held in November 2015 at Lindsay Street Baptist Church in the Vine City neighborhood of Atlanta. This forum was targeted toward community engagement and bridging the gap between the AUC and the community. Presenters included Trish O’Connell, Atlanta Housing Authority, Shannon Lee, the Conservation Fund, Walt Ray, Park Pride, Tony

Torrence, Community Improvement Association, Susan Rutherford, City of Atlanta, Department of Watershed Protection, Gary Harris, and Center for Sustainable Communities, Art Frazier, Spelman College, Dr. Charles Thomas, ITC and Bill Eisenhauer, MAUWI. Mr.

Michael Mitchell, EPA served as the moderator of the morning session. Student presentations were made by Sydney Hubbert and Imani Love, Spelman College. Attendees developed actions plans targeting four areas of activity: 1) Proctor Creek Learning Exchange; 2) Smart Relocation Resource Center; 3) Workforce Development for Green Infrastructure; and 4) Advancing Proctor Creek Conceptual planning. Fifty (50) people attended the forum.



2.4.3 Community Forum No. 3

The third Forum was held in March 2016 at the Lindsay Street Baptist Church. The community-focused forum discussed flooding issues, associated health concerns, flooding mitigation, green infrastructure solutions and green jobs. Forty (40) persons attended. Presentations were made by two community members, Tony Torrence and Juanita Wallace as well as by Dr. Yomi Noibi.

Discussion: Three forums were held. The total number of attendees and the number of student presentation were fewer than planned. Nevertheless, the forums were well received with participants expressing generally positive feedback. Several attendees have become champions for Green Infrastructure in their residential and campus communities.

2.5. Green Infrastructure Conference

Planned Measure of Effectiveness: A Green Infrastructure Conference will be held for all stakeholders to increase public and decision makers' awareness and support for implementing green infrastructure solutions

Actual Achievements:

The Conference was a culmination of the project and showcased the students' Conceptual Plan presentations. 220 persons registered for the day-long event.

Conference activities included We Dream Green: a student-led panel discussion on green infrastructure, breakout sessions including a Green Infrastructure Lab (for students), short films

as well as short dramatic presentation made by AUC college students. The drama focused on changes that ordinary people can make to reduce the negative impacts on water quality. Four conceptual plan presentations were also made by Spelman, CAU and Morehouse students. The conference Keynote Address, “Equity Our Saving Grace” was delivered by Nathaniel Smith, of the Partnership for Southern Equity.

The conference closed with statements of continued support to green infrastructure. A copy of one of the student organization statements of commitment appears in Appendix B. A video that documents partner organization commitments made during the conference has been posted on the ECO-Action website (www.eco-act.org).

Discussion: Specific conference outcomes were to:

- Increase understanding about green infrastructure,
- Increase awareness about the impact of flooding on nearby communities and usefulness of green infrastructure in addressing these problems,
- Strengthen academic community/residential partnerships,
- Showcase student-created conceptual designs,
- Leverage partnership and collaborations to convert conceptual plans to shovel-ready projects.



All conference participants were invited to evaluate the conference using either a paper or online survey that had been developed prior to the event. Fifty-seven persons completed the evaluation. A copy of the summary documentation has been provided in Appendix C.

Some attendee comments under the heading “Liked Best “ were: the opportunity for networking, the variety of views shared, interdisciplinary approach to GI, individuals learned a lot about Proctor Creek, variety of backgrounds able to come together to discuss, found the event very informative. Attendee comments under the heading “Needs Improvement”

included: more community speakers during plenary session, more time, needed more time for community networking.

3.0 Additional Outcomes

3.1 Sharing the Project with a Larger Audience

Project reports, PowerPoint presentations, the Conference agenda, notes and proceedings have all been documented on the ECO-Action website to facilitate the sharing of materials compiled and developed for this project among students, university staff, and faculty and community members. A link to the site is provided here: <http://eco-act.org/programs/inspiring-youth/green-infrastructure-at-the-atlanta-university-center/>

We will be sharing the reports that were developed on Proctor Creek Stewardship Council and West Atlanta Watershed Alliance websites as well. All of these sites will be available for broader outreach to other non profits, foundations, corporations, government jurisdictions, and the public at large.

3.2 Partnerships and Collaborations

In addition to the planned project outcomes previously described, the team developed a number of additional partnerships and collaborations through its outreach efforts. These partnerships will be beneficial as ECO-Action seeks to advance the use of green infrastructure on the campus and in the community beyond the grant period. Some of these budding partnerships and collaborations are described below.



Atlanta Housing Authority (AHA): ECO-Action has engaged AHA staff in green infrastructure conceptual planning for a low-lying, 20 acre parcel owned by AHA located on Atlanta Student Movement Boulevard roughly at the center of AUC campuses. We are garnering their long term support for storm water capture at their many other developments in the headwaters of Proctor Creek.

Photo taken after Imani Love (Spelman student) presentation to AHA

The City of Atlanta and other project partners: Partners for the Sunset Avenue Greenway Plan on the Morris Brown campus include The Conservation Fund, Park Pride, Westside Future Fund,

The Blank Foundation, Invest Atlanta and NewFields. The Plan aims to capture five or more million gallons of stormwater runoff from AUC campuses and to infiltrate 0.5 to 1.2 MG.

We are also working with Andrew White at Park Pride to develop a map of the overall study area showing recommended greenways and parks connected together with ephemeral streams.

Woodruff Library Administration and AUC College Faculty: Construction of green Infrastructure elements at the Woodruff Library on the Clark Atlanta campus is nearing completion. Greenscape elements that are part of the project include rain garden that filters stormwater collected from the site, underground infiltration /storage chamber that allows infiltration of the first 1-inch of runoff from the site and limits peak stormwater runoff to pre-development rates in compliance with the City of Atlanta Stormwater ordinance; and pervious ‘slate scape’ that allows initial infiltration from portions of the lower level Greenscape plaza.



According to the Program Manager, the inclusion of the Rain Garden was encouraged by the Woodruff Library Team as an opportunity for a demonstration project for creative stormwater management practices that could be used by faculty to teach principles of sustainable development.

The Army Corps began their investigation of the feasibility study of restoring Proctor Creek earlier this year. ECO-Action’s initial presentation in March 2016 included the exploration of the possibility that student conceptual plans might be developed into complete design documents. The funds that Corp has already received are limited to efforts that support feasibility study development. Continued work with the Army Corp and the feasibility study may provide some leverage with which ECO-Action and its partners might gain additional funding support.

The AUC/Vine City English Avenue EcoDistrict is a geographically defined neighborhood where the residents have the opportunity to utilize best practices to create and develop a sustainable community to improve the quality of life for all residents who live, work and play in the

community. AUC/Vine City English Avenue is a participant in the EcoDistricts Target Cities pilot program, a new two-year partnership with ten development projects across eight North American cities to amplify and accelerate district-scale community regeneration and create replicable models for next-generation urban revitalization. Following the Green Infrastructure Conference, ECO-Action has begun to collaborate with the University Community Development Corporation and its partners in the EcoDistrict program to continue AUC and community activities in support of green infrastructure beyond this Urban Waters Small Grant project.

4.0 Achievements, Reflections and Path Forward

As ECO-Action and its partners have worked on this project, we have made progress toward the achievement of all the planned project objectives. Our team has made the greatest progress toward the achievement of Objectives 2 and 3.

Objective 2 identifies engaging, educating and empowering as a key goal of the project. This project sought to specifically engage, educate and empower students, staff and faculty at the AUC colleges and universities and residents of nearby low-income communities of Vine City and English Avenue. The EPA video, Making a Visible Difference (MVD Proctor Creek Education) is a reflection of our education work at the AUC campuses and the Proctor Creek community. The video can be viewed here: <https://www.youtube.com/watch?v=SVODP-yg7E&feature=youtu.be> We expected that by giving all community members the opportunity to collaborate to develop solutions for mutual benefit, they would arrive at the best and most equitable solution to this long-standing flooding issue.

Through this project, we have sown the seeds of green infrastructure in the minds and hearts of the faculty, staff, students of the AUC community and residents and stakeholders of the downstream communities of English Avenue, and Vine City and other Proctor Creek communities involved in the Proctor Creek Stewardship Council. Participant comments included on evaluation forms collected after the community forums and conferences substantiate this view. ECO-Action will seek resources to continue to support efforts to engage, educate and empower the both the AUC and the surrounding residential community as this project comes to a close.

Involving underserved communities was named as **Objective 3** of the project. Members of the underserved communities directly impacted by the flooding issues were very heavily and directly engaged in the development of green infrastructure solutions through their involvement in service learning, Community Forums and Conference events. Through its strong emphasis on engaging AUC students, the project was particularly successful in promoting intergenerational learning and dialogue toward the goal of empowering low-income residents to address environmental issues in their community.

We have established a bridge of communication and learning exchange for green infrastructure between the academic AUC community and the downstream communities of English Avenue

and Vine City. The involvement of the ECO-District initiative in green infrastructure is part of this bridge. Faculty members, staff, students and community residents/leaders who have expressed a commitment to uphold this bridge can continue to do so at the end of the project funding.

Objective 4 seeks to provide support of community priorities. The project addressed community priorities beyond environmental concerns. The ECO-Action proposal indicated that these priorities included the desire to: create aesthetically pleasing and useable green space for the community by dedicating 20% of the study area as public green space, create green jobs and community ownership as a means of engaging residents, and promote the economic vitality of the PNA study area. Planned green infrastructure solutions will create additional green spaces on the college campuses, and implementation of these solutions will encourage existing green spaces to be retained as well. The Sunset Avenue Greenway is the most publicly accessible of them all.

Specific investigation of green infrastructure as an entry into green jobs and businesses was addressed at both Community Forum No.2 and the Green Infrastructure Conference. ECO-Action will seek to continue our work with non-profit green job advocates including Groundworks, and Greening Youth Foundation, as well as community entrepreneurs to encourage the creation of green infrastructure maintenance jobs in these communities. We have very recently begun to partner with Integrity Transformations Community Development Corporation in English Avenue, a community based workforce development agency, to develop training programs for jobs in green infrastructure maintenance.

As we worked with the community some additional priorities emerged that included helping those most affected by storm water flooding and damage learn more about the health effects of exposure to combined sewage and how they could better respond even as far as relocating from damaged housing or pressuring landlords to repair damaged property.

The goal of **Objective 1** was to address local urban water quality issues. Through the creation of the conceptual plans, our team believes we have taken the first step to reduce the quantity of untreated stormwater entering the Creek. We have also formed some initial partnerships with organizations that might implement or advocate for the implementation of these strategies on the campuses and in the community. There still are a number of steps to be taken before we can declare this long-term objective to be fully achieved.

4.1 Next Steps Following the Green Infrastructure Conference

At the conclusion of the May 2016 Green Infrastructure Conference, a number of community organizations, non-profits and local governmental agencies voiced support for green infrastructure through the delivery of Statements of Commitment. We are awaiting written versions of these statements from the student groups that participated in the conference. Some program participants are graduating or will graduate soon. ECO-Action plans to use this

written documentation to mobilize subsequent cohorts of students in support of future green infrastructure construction on campus.

In addition, responses to the post conference survey pinpointed attendees who are committed and excited to continue their support for green infrastructure at the AUC and the communities that surround it. Our next steps need to leverage this interest to sustain the momentum toward our goals as the project winds down. We are working with the ECO-District initiative to hold a working session for those who have expressed interest in continuing this work.

4.2 Continuing the Work to Improve the Quality of Proctor Creek

As noted earlier, this project has developed nine conceptual plans to reduce the quantity of untreated stormwater and raw sewage which currently floods lower elevation neighborhoods and flows into Proctor Creek.

ECO-Action will seek resources to implement the conceptual plans. First, it will be necessary to organize outreach teams to nurture collaboration and cooperation among the private and public stakeholders in each catchment. Inclusive community engagement will be the key to successful implementation. Once the stakeholders agree to move forward, more complex hydrological and hydraulic analyses will be necessary along with cost/benefit analyses. This step will require additional resources and expanded teams.

Construction implementation is likely to take place piece by piece over an extended period of time, perhaps decades. Faster implementation is preferable, of course, but we know that each individual project will contribute to improving public health, and quality of life, and Proctor Creek water quality. EPA officials have suggested that one resource for green infrastructure work could be Federal 319H grant funding through the Georgia Environmental Protection Division. Additional sources of funding and other resources should also be investigated.

In conclusion, this has been an important project that has considerably advanced green infrastructure awareness both on the college campuses and within the surrounding downstream communities of English Avenue and Vine City. The project has built partnerships between the AUC academic community and the surrounding neighborhoods that will support green infrastructure development beyond this project. The sustainability of our success will depend on nurturing and investing in these and other relationships and partnerships to foster collaboration and cooperation between private and public stakeholders. This is our challenge. We believe the seeds of Green Infrastructure we have sown through the EPA Urban Waters Small Grant program will help us achieve success in our future efforts.

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A P P E N D I X A

List of Student Presentations and Conceptual Design Reports

Student Presentations

Green Infrastructure Enhancements for the AUC: Ogechi Ironi, Clark Atlanta University
<http://www.slideshare.net/ECO-Action/ogechi-ironi-0315>

Building Green: Repurposing Stormwater for Sustainable Development: Ruth Wangia, Spelman College, <http://www.slideshare.net/ECO-Action/ruth-wangia>

The Reutilization Center: The Brianna Ford Institute for Sustainability: Sederra Ross, Clark Atlanta University, <http://www.slideshare.net/ECO-Action/sederra-ross>

Spelman College Green Infrastructure Conceptual Plan: Imani Love and Sydney Hubbert, Spelman College, <http://www.slideshare.net/ECO-Action/spelman-college-green-infrastructure-conceptual-plan>

Conceptual Plan Reports

Conceptual Plan for Spelman College: Imani Love and Sydney Hubbert, Spelman College

Conceptual Plan for Catchment Area 1: Sederra Ross and Meron Aberha, Clark Atlanta University

Three Conceptual Plans for Catchment Area 2, Sydney Hubbert, Spelman College

Conceptual Plan for Catchment Area 3, Alaron Hubbert, Morehouse College, Crystal Williams, Spelman College, Justin Whitt, Morehouse College

Conceptual Plan for Catchment Area 4, Krista Montgomery, Spelman College, Emanuel Russom, Morehouse College

Conceptual Plan for the AHA-owned property east of Morehouse College, Imani Love, Spelman College, Matthew Ramsay, Morehouse College.

Conceptual Plan for Sunset Area Greenway: Krista Montgomery, Spelman College, Emanuel Russom, Morehouse College Sydney Hubbert, Spelman College; Sederra Ross, CAU; Meron Aberha, Imani Love, and Matthew Ramsay in support of lead partners, Conservation Fund and Park Pride.

A P P E N D I X B

Student Organization Commitment Statements

See documents attached

**Clark Atlanta University Living Green Club
Statement of Commitment to Green Infrastructure**

The Living Green Club of Clark Atlanta University enthusiastically supports Environmental Community Action (ECO Action) as it promotes the development of student-created conceptual design for green infrastructure to capture 22.4 million gallons of stormwater on Atlanta University Center (AUC) campuses into complete, shovel-ready design projects. These conceptual designs should be considered for addition into Clark Atlanta's University master plan and the master plan of other AUC colleges. We intend to continue supporting ECO-Action in the next phase of its work; leveraging the partnerships and collaborations created over the last two years to make envisioned green infrastructure projects a reality on campus.

As an organization that promotes environmental awareness and sustainability it is important that we encourage Clark Atlanta University and other AUC Colleges to advance sustainable technologies such as green infrastructure. As flooding persists in communities downstream from the Atlanta University Center it becomes our responsibility to assist in the alleviation of stormwater runoff in these negatively impacted neighborhoods. Using green infrastructure will improve the quality of Proctor Creek, an underutilized and unappreciated asset which sits in the midst of Atlanta's Westside. Furthermore, green infrastructure is a cost effective way to mitigate excessive stormwater thus not only reducing flooding, but creating a healthier, cleaner, and progressive environment. Therefore, we have an opportunity to serve as innovators, visionaries, and agents for change that are not only a part of movement, but a part of improving the world.

Based on the work that has been done over the past two years, we want to encourage AUC students, staff and administration to consider green infrastructure as an asset and stormwater as a resource to meet their on-campus irrigation needs rather than diverting it offsite. Doing this will prevent flooding in downstream communities, create a cleaner Proctor Creek, and a culture for sustainability that permeates throughout generations.


Sederra Ross

President, Living Green Club of Clark Atlanta University, 2015-2016

May 5, 2016

Spelman College Environment Task Force
Statement to Commitment to Green Infrastructure

The Spelman College Environmental Task Force, also known as ETF, is a grassroots, student-run organization established to raise the awareness of the Spelman College community in terms of environmental issues, to provide a greater student voice in planning for conservation at the college, and to promote environmental education as a top priority. Additionally ETF raises environmental awareness, provides a greater student voice in conservation planning and promotes environmental education. As an organization that promotes sustainability and environmental awareness and justice we solely support ECO-Action and its efforts to implement green infrastructure in the AUC and Westend community. Some contributions that the Environmental Task Force has contributed to Eco-Action is being apart of the conceptual designs and planning for collecting runoff water in the AUC. Additionally, we hope to continue the partnership with Eco-Action in efforts to make the AUC more sustainable through green infrastructure initiatives.

As a grassroots organization, ETF has made many efforts to contribute to creating a sustainable community within Spelman and in the surround Westend community. Majority of our efforts have been dedicated to educating people on sustainability issues that are disproportionately affecting minority people of color. One of the major green infrastructure issues that we have addressed is flooding in the AUC and proctor creek. Eco-action has allowed us to not only educate people on flooding in the AUC but also allowed us to come up with innovative ways to create solutions to the problems. The Environmental Task Force hopes to continue to be a changing agent in the development of green structure in the AUC and in other areas such as the historical Westend.

Krista Montgomery
President of the Environmental Task Force 2015-2016
August, 3, 2016

MAUWI

Metropolitan Atlanta Urban Watershed Institute

June 30, 2016

To Whom It May Concern:

For two years, the Metropolitan Atlanta Urban Watershed Institute (MAUWI) has supported the ECO-Action project to engage students, faculty and staff of the Atlanta University Center (AUC) campuses in designing nine Conceptual Plans to capture stormwater runoff from the study area. We will continue to support Evocation's next steps. First, they will need to find the resources to nurture collaboration and cooperation among public and private stakeholders in order to encourage them to agree to move forward. Then they will need to seek funding for the more complex analyses necessary for project implementation.

Stormwater runoff laced with raw sewage currently floods nearby neighborhoods and downstream communities in the Proctor Creek community. These third-world conditions adversely affect public health, public and private property and the environment. We believe that the AUC institutions need to reduce these persistent negative flooding impacts. Green infrastructure features should become an essential element of Master Planning efforts at the AUC institutions.

The students involved in developing the Conceptual Plans were highly motivated by both the need to eliminate the public health issues and the benefits of public greenspaces on the campuses. AUC institutions can develop a national reputation for demonstrating how green infrastructure can be used to deal with water quality and sustainability issues in urban areas. This reputation is likely to attract students and institutional funding.

Green infrastructure can also save money. Retained rainwater can be used for irrigation, makeup water for cooling systems, drought resiliency, and other purposes.

MAUWI will continue to support concerted efforts to transform the nine Conceptual Plans to shovel ready designs to manage stormwater issues in a sustainable way.

Very truly yours,



William C. Eisenhauer
Director

A P P E N D I X C

Summary of Feedback from Green Infrastructure Conference

See Document attached.