

# “Campus As Lab” at Duke

Client: Mark Hough  
Duke University Landscape Architect

ENVIRON 245 Project Brief  
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## Bridging Campus and Curriculum

### Background:

In 2015, Duke University invested \$11.5 million into a large-scale sustainable stormwater management project on Towerview Road: the Water Reclamation Pond. Not only was this project a financial investment--saving \$400,000 for the University per year--it was meant to be used as an educational resource for students. Unfortunately, students are not utilizing this space for learning. In fact, a survey conducted found that of 131 undergraduate students, 92% of said students are unaware of stormwater management projects on campus such as the Water Reclamation Pond, the Medical Center Greenway, and the stream restoration project. This brief is meant to inform The University of current awareness of these spaces and how best to facilitate educational engagement with these spaces.

The phrase “Campus As Lab” describes Duke’s hope of expanding physical campus projects into useful tools for classroom instruction. The Duke Water Reclamation Pond, Medical Center Greenway, and stream restoration project all have the potential to become “lab” spaces, which would serve to inform students and instructors of the benefits of effective stormwater management practices. These three projects serve as case study sites for the information provided in this brief.

Many universities have already started “Campus As Lab” initiatives to facilitate the use of physical spaces as educational tools. Mark Hough, Duke’s University Landscape Architect and client for this project, hopes to build on these established initiatives to connect the Water Reclamation pond, and other spaces like it, to undergraduate curriculum at Duke. This brief seeks to inform Hough and other staff members of how best to promote awareness and facilitate engagement with these spaces as educational resources on campus.

It would positively impact the curriculum and learning potential of Duke University if the institution could gain a better understanding of how to utilize specific outdoor campus spaces as productive learning environments for instructors and students.

### Research Question:

**How can Duke institutionalize the use of outdoor spaces as educational resources for undergraduate instructors and/or students, utilizing the Duke Water Reclamation Pond, the Medical Center Greenway, and the stream restoration project as case studies?**

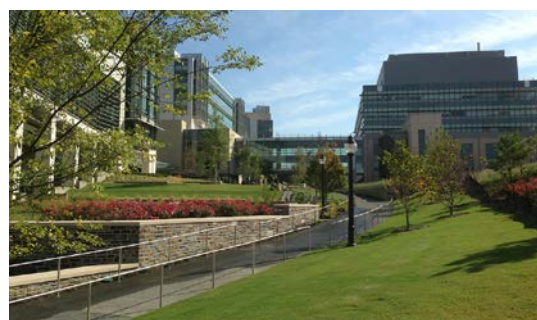
- Are students and instructors aware of the existence and functions of these case study sites?
- How can the university best engage students, faculty, and community members in the use of these spaces as educational resources?

### Objectives:

- Explore peer institutions’ best practices on “Campus As Lab” programs
- Gauge current student knowledge and interest in campus-based learning
- Seek faculty guidance on best ways to bridge campus and curriculum and facilitate campus wide engagement



*Figure 1. Duke’s Water Reclamation Pond serves as stormwater management practice meant to improve the sustainability of Duke’s water usage.*



*Figure 2. Duke’s Medical Center Greenway, a rain collection management system located outside of the Duke Medical Center.*

# Methods:



## Stakeholder Interviews

**Why:** To understand what prevents faculty from using these three sites for instruction and how Duke can better facilitate site engagement; to understand current state of awareness of these sites

**Design/Distribution:** The team then emailed instructors across many departments who were willing to discuss the “Campus As Lab” initiative. One question guide was created and used for each interview.

**Analysis:** Team members analyzed transcripts by hand and coded for themes to understand barriers for use from faculty perspectives and suggestions for improving faculty engagement. These findings were compared to campus best practices found at UVA and Georgia Tech for overlapping suggestions.

## Site Observations

**Why:** Sites were observed to understand their current use in comparison to student awareness and faculty suggestions.

**Design/Distribution:** Team members observed all sites in 30 minute intervals. They documented activities, conversations, and visitor demographics. This information was then compared to faculty and student awareness of these sites.

**Analysis:** Team members analyzed field notes by hand to identify who visits these sites most often and for what purpose(s).

## Student Surveys

**Why:** To understand student awareness of these sites, student interest in using these sites as educational tools, and student suggestions for how these sites can be used within specific majors of undergraduate curricula

**Design/Distribution:** Team members created a survey using Google software and then distributed said survey through email to various student groups on campus. Student groups from a variety of backgrounds and interests were selected to ensure participants were representative of all sections of student life.

**Analysis:** Team members quantitatively analyzed results by calculating the percentages of how many students answered either yes or no to each question. Team members also analyzed responses to the open-ended suggestion question by identifying and noting suggestions mentioned more than once within one major.

## Other Campus ‘Best Practices’

**Why:** To understand how other campuses have successfully addressed the same research question

**Analysis:** Team members analyzed other campus sustainability reports to find best practices and was compared findings to faculty and student suggestions for similarities.



The “Campus as Lab” initiative addresses sustainability on Duke’s campus regarding how it promotes long-term use and engagement with physical spaces in ways that encourage the University to invest in future sustainable spaces.



**Sustainability Components for Stormwater Management Projects:**

### Economic

Focus on long term economic sustainability in water and energy conservation through the conservation of potable water

### Environmental

Focus on communicating and educating the Duke community about sustainable stormwater management practices on campus such as the Water Reclamation Pond

### Social

Focus on the promotion of sustainable social values by promoting the use of green areas and trails for recreation and family activities

# Results and Findings:

## Awareness

Findings indicate that students and faculty are most aware of the pond and least aware of the stream restoration project, with 27% of students unaware of all three sites. Findings show that both faculty and students primarily use these sites for recreation and that both groups are interested in using these spaces for education.



## Ways to Improve Engagement

A comparison of best campus practices and faculty findings indicates that making information easily accessible to instructors through a website is an effective way to facilitate educational engagement. Faculty also indicated that these sites and their uses need better marketing.

## **Findings from Student Surveys**

- 82% of students see Duke's physical campus as a resource for their education
- 76% of students would want to take a course that interacts with the campus
- 27% of students are unaware of the Water Reclamation Pond, stream restoration project, and Medical Center Greenway

Students also submitted a variety of recommendations for how these sites could be used in their respective majors. This indicates that students are interested in using these spaces. Suggestions for disciplines such as Biology, Environmental Science, and Public Policy were consistent with faculty findings in stakeholder interviews.

## **Site Observations Findings**

Water Reclamation Pond used for recreation (running, family outings, etc) and local education-there are some parents and Durham Schools who use it for instruction  
Medical Center Greenway used as a transit zone or lunch area  
Stream Restoration Project rarely visited

## **Faculty Findings**

Pre-made information slides: information should be easy to find and access for faculty because they are unlikely to seek out new information about projects on campus  
Better marketing strategy: advertising these spaces better could make instructors aware of their existence and improve the likelihood of their use  
Website: compiling all information relating to these sites into one location, a website, could improve the likelihood that instructors would use these spaces

## **Other Campus "Best Practices"**

Website: campus engagement at UVA and Georgia Tech has been improved by the creation of websites with information about how spaces can be used for classroom instruction  
Organized Workshop Days: instructional workshops have increased student interest in using campus spaces as educational resources at UVA

# Recommendations:

The team recommends the creation of the following educational and/or informational tools to facilitate awareness and engagement:

## Website

Information compiled in one location detailing everything related to planning, implementation, and impact of these sites. The website should also show how specific departments can utilize these sites in the lectures and laboratory sections.

## Pre-Made Slides

Pre-made slide templates for different disciplines (Public Policy, Ethics, Economics, History, Environmental Science and Policy, etc.) that can be easily used in class with minimal effort from Professors. Can be stored on website.

## Signage & Marketing Tools

Implement a more effective marketing strategy to raise awareness of these spaces. These strategies can include improved signage indicating purpose and location, brochures, website, workshop days, etc.

## Examples for Instruction Related to Case Study Sites

Economics and Public Policy: conduct cost-benefit analysis on project impact

Computer Science: analyze sensor data

Electrical Engineering: design device to measure stormwater management efficiency

English: read literature related to nature (Thoreau)

## Recommendations for Future Work

Improve marketing of these spaces through the creation and dissemination of pre-made slides and brochures.

Create a website that stores all information regarding these case study sites and how they can be used. Identify other on-campus spaces that could be used for instructional purposes to include on the website.

Solicit and implement feedback from aforementioned professors in the creation of in-class learning tools for particular departments or majors.



*Figure 5: Taken from Duke Today magazine, this picture shows the Water Reclamation Pond, one of the features that the project aims to analyze.*

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