Mean Green Wall

We Mean Green Funded Project

PROJECT REPORT

- Spring 2023 -

Written By

Savannah Thomas

Savannahthomas2@my.unt.edu

Project Advisor

Brian Wheeler

brian.wheeler@unt.edu

ABOUT OUR PROJECT

This project began with the goal of installing a green wall on campus. After realizing there was lack of information on the entire process, we switched to focusing on interdisciplinary collaboration through a workshop series and experimenting with small green wall structures.

GOALS

- Develop and host educational & creative workshops lead by students.
- Learn more about green walls and provide information on how UNT can implement vegetation in vertical spaces on campus.
- Experiment with various green wall systems.

OVERVIEW

During Spring 2023, three workshops were held. These workshops were successful in providing a creative space for participants.

Challenges

In general It was difficult to lead this project without a co-lead (or someone who was equally committed).

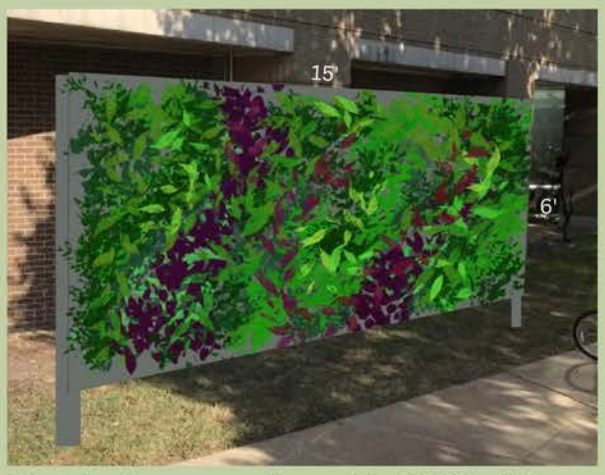
I was not successful in gaining interdisciplinary support/involvement despite about a month of extensive emailing.

Overall, the lack of time and interdisciplinary involvement have been the dominant challenges. I worry about my ability to complete our summer goals without consistant student involvement.

TIMELINE

Fall 2022

Wrote WMGF proposal for green wall workshops, design, and installation on the UNT Campus. Then scaled back the proposal to focus on the interdisciplinary collaboration and development of ideas, and information on green walls.



Sketch of green wall outside ENV building

Spring 2023

January
The project was funded $1,680 by the WMGF

February
Workshop planning and materials purchased

March - April
Workshop 1,2, and 3

May
Write spring progress report, literature review on other green wall projects, contact project leaders of existing green wall projects in Texas.

Summer 2023

May - June
Start using tower garden in ENV building and tour UNT hydroponic produce systems to learn/experiment with native plants in a hydroponic system.

Work with students to design 3D models of green wall systems.

July
3D print the green wall models. Plant plants in them if possible.

August
Monitor experimental green walls and submit completed report on the project.

PEOPLE

Project Lead
Savannah Thomas

Project Advisor
Brian Wheeler

Proposal Authors
Savannah Thomas
Madison Rutherford

Student Leaders
Calvin Nering
Madison Rutherford
Clarissa Molina
Emma Land
Mckenzie Davis
Max Thomas
Cellia Ault

Participants
Aspen Davis
Eva Dwelle
Koby Osowski
Diane Karch
Grace Deckard
Carson Nick
Macy Faust
Jimena Vivanco
Abby Heath
Chloe Coleman
Audrey Addington
Riley Rhodes
Jasmine Brewer
Ben Bishop
Colton Weed
Tucker Richardson
Chris Gomez
Percy
Samantha Kelly
Brayden Mittag
and more

This was a collaborative project. Everyone from project leaders to participants contributed to the projects goals and success,

Everyone help how they could. Participants even loaned a hydroponic tower garden to be used over the summer to experiment with native plants.

Project leaders communicated through a discord server and participants were contacted via email.

ADVERTISING

A google form was used to register students for any of the workshops.
By providing their email, we had a way to contact them with futher information.

The workshops were advertised via

- Email
- Flyers posted around campus
- Social Media
- Shared information in student organizations
- Word of mouth

The graphics used are in the end of the document.

WORKSHOP 1

Art & Nature in the Urban Environment

When
March 20th & 23st
6:30 - 8 PM

Sign up - 40
Show up ~ 30

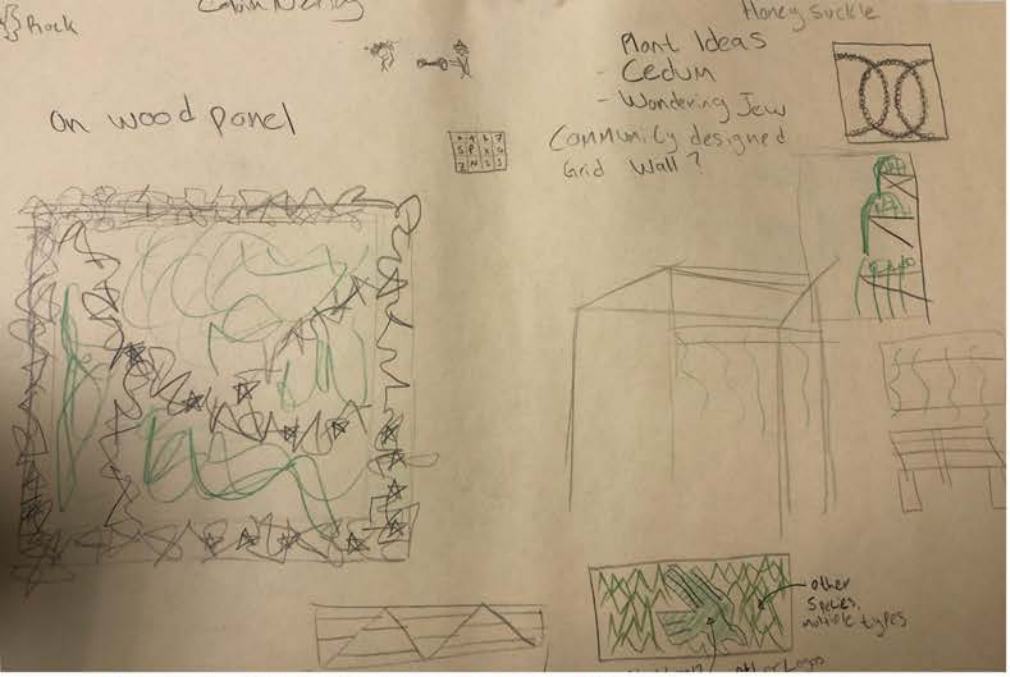
Purpose
This event was the introduction to the project and green walls to many participants. The group started to think creatively about art and nature through a green wall design exercise.

Agenda
- Introduce the workshop series
- Introduce green walls & green infrastructure
- Discuss the importance of nature & art in built environments
- Overview of plant characteristics
- Sketch green wall design

Supplies
Multiple colors of construction paper, markers, pens.

Event Success
People were intrigued and engaged in the presentation & claimed the drawing exercise was calming and fun. There were questions and ideas throughout the event.

Critique
There was mixed familiarity with the topic, making it difficult knowing how in depth I needed to explain the material.


Rock
Honeysuckle
Plant Ideas
- Cedum
- Wondering Jew
Community designed
Grid Wall?
On wood panel
other species, native types


Native grasses or moss
Native flowers


High Plains
Cross Timbers & Prairies
Blackland Prairie
Post Oak Savanna
Rolling Plains
Piney Woods
Trans-Pecos Mountains
Edwards Plateau
Gulf Prairies & Marshes
South TX Plains
*10 Segments/ 10 Cities
*Native plants to showcase each region
*other portions of wall

WORKSHOP 2

An Evening with Moss

Purpose

This event allowed participants utilize what they learned in workshop 1 to design a moss wall. This event was focused on the creative aspects of green walls.

Agenda

- Set up supplies
- Create
- Show & tell

Supplies

- Multiple colors, and textures of preserved moss
- Wooden frames and pieces
- scissors & mall handheld saw
- hot glue & wood glue
- rocks, sticks, bark
- Fake plants

When

March 27th & 30th
6 - 8 PM

Sign up - 45
Show up ~ 35

Event Success

People enjoyed the creative process of designing and creating the moss walls. Some teamed up to created single designs.

Critique

People who did not go to the first workshop were not aware of the scope of the project.
















WORKSHOP 3

Green Wall Brainstorming

When
March 17th & 20th
6 - 8 PM

Sign up - 30
Show up ~ 9

Purpose
This event focused on brainstorming ideas for future green walls on campus, and experimental green walls.

Agenda
- Discuss the below questions then watch videos on different green wall systems & discuss what we want to make.

What community needs can green walls address on campus?
- More vegetation = Aesthetics, relaxation, mental health
- Air & noise pollution mitigation
- Research & education opportunities
- increased native plant/pollinator presence
- exposure to green walls and native wildlife and green infrastructure
- Edible garden

What locations on campus or in the City of Denton would be ideal for a green wall?
- ENV bldg and bus stop outside bldg
- Union entry ways
- Art bldg rooftop or courtyard - partner with art students
- Music courtyard - Lots of facades that could use native plants
- New research building could have indoor green wall with metrics measured
- Community garden
- Quakertown park
- Local businesses
- Denton post office
- alleyways around the square

Event Success
Our group discussions/reflections/ideas were beneficial to the project moving forward.

Critique
Low participation. This may be due to the event not sounding appealing, busy time in the semester, and the lack of a reminder email the week before.

What student groups or city organization could partner with a green wall project?
- SER
- BCUSA
- UNT Transportation
- City of Denton
- Bird campus
- NPSOT
- Denton Beekeeper society
- Texas Conservation Alliance
- UNT Dining
- Tx Wildlife society
- Master naturalist and master gardeners
- UT Austin
- Painted Flower Farm
- Native American Seed
- Elm Fork Education Center
- Keep Denton Beautiful

MEASURING PROJECT SUCCESS

Outcome 1

Provide educational workshops:
To involve the UNT community in designing and installing a green wall on campus. The goal for this is to provide a new and unique, hands-on learning experience and an opportunity to be a part of creating something on campus.

This outcome will be quantitatively and qualitatively measured using surveys given to workshop participants at the end of the workshop series.

The workshops successfully introduced new concepts/ideas to participants.

People expressed enjoying the creative aspects of the workshops.

A survey has not been sent out yet. This will be done in May.

Outcome 2

Create experimental green walls:
Creating smaller experimental green walls will provide experience and information needed to create a larger scale, outdoor wall in the future.

Experimental walls will be monitored.

Experimentation is starting in the Summer.

Outcome 3

Serve as an experiment and example of how green infrastructure can be incorporated at universities and local governments:
Document and provide information on the challenges and solutions in designing and implementing a green wall. Doing this in a small scale throughout the workshops allows us to create and learn with low risk to inform a larger green wall project.

The City of Denton expressed interest in these metrics.

Final report will address this.

SUMMER PLANS

The focus moving forward is experimenting with designing, and constructing small green walls. The main purpose of this step is to create a space for creative collaboration and test out native plants in green wall systems.

Experimenting with ways native plants can occupy vertical spaces in built environments is important because it can transform spaces of no ecological value, to a habitat that supports native plants and wildlife.

We are focused on designing modular panel systems that allow the plant containers to be easily removed from the wall for planting/maintenance.

Panel systems use wall panels with pre-planted plants. The panels are installed directly onto the wall of a building using a support structure.

Modular panel green wall system (Iran Green Agent [CC BY-SA 4.0] via Wikimedia Commons).

Felt systems use a growing medium with felt pockets where you put the plants. Plastic pipes run through the wall,keeping the felt moist so the plants can grow.

Misting plants in a felt pocket system (tomazl via iStockphoto).

In a **trellis system**, plants grown in containers are **trained** (directed) to grow up a wall trellis. A trellis is a structure of wood or metal bars designed to support climbing plants. This system is similar to a green façade, except the plants are rooted in pots and not in the ground.

Climbing plants on an indoor trellis next to a window (Foto_by_M via iStockphoto).

ACTION ITEMS

Throughout the next few months, our team will attempt to complete the following tasks.

- Send our survey gaging peoples experience with the workshops this semester.
- Design and create 2-3 experimental green wall systems. This may include models of green wall bus stop designs, 3D printed modular compartments of a larger design, small structures/systems experimenting with various methods of green wall construction.
- Plant native plants in the experimental systems. This includes anything we design and create, and the use of the Tower garden.
- Literature review of existing green wall projects
- Contacts from existing green wall projects (Specifically Texas A&M and Texas State)
- Tour the UNT vertical farms
- Continue to collaborate and learn with students. Hopefully teaching each other skills like 3D modeling, and about native plants.
- Complete a final project report detailing the entire process, and results.

EXTRA INFO

BARE PLACES

SSB Building is extremally visible from I35 as you enter UNT. The outside is very bare, characterless, and surrounded by concrete. Adding a green wall system or even a facade somewhere near the entrance or courtyard would help bring color and more vegetation to the building, It could also help mitigate the particulate matter pollution in the air as this building is close to the highway, busy roads, and parking lots and is lacking natural spaces to absorb pollutants.

The Facilities office building is similar to the SSB. It is an area that is surrounded by concrete with little vegetation. By adding a vertical vegetation, this building could be more appealing for employees.

RECOMMENDED SPECIES LIST

The following native plants have been recommended. These may not all do great in a green wall system, this is why experimentation is needed.

In general, we think it is best to avoid plants with woody stems and focus on grasses, and flowering plants. A more in depth list of plants, there photos, and characteristics will be included in the final report.

- Greggs mistflower
- Blue mistflower
- Purple coneflower
- Goldenrod
- Prairie verbena
- Rattlesnake master
- Liatris
- Skeleton leaf godeneye
- Spiderwort
- Common yarrow
- Mexican mint marigold
- Autumn fall aster
- Texas cup grass
- Autumn sage
- Mexican Feathergrass
- Four-nerve daisy
- Indian grass
- Eastern gamagrass
- Silver pony foot
- Turks cap
- Cedar sage
- Butterfly bush
- Rock rose
- Cross vine
- Coral honeysuckle
- Passionvine
- Wolly dutchman's pipevine
- Pearl milkweed vine
- Trumpet creeper
- Texas wisteria
- Honey-vine climbing milkweed

Likes water (Riparian type plants)

- Frogfruit
- Buttonweed
- Rushes
- Straggler daisy
- Buttercups ranunculus
- Cardinal flower
- March fleabane puchella
- Pinkweed

Plant Sources	
Tree Nursery Co	located in Tennessee. Can ship to Denton. They donate plants to research labs, nonprofit organizations, or any school program that needs native plants for research or science purposes. Online and in person purchases. Has a wide variety of native Texas plants Website includes plant information for our zone
Plant Delights Nursery	located in North Carolina. Ethically sourced native plants. Extensive number of products. Have a "living wall" page where you can purchase plants specifically for green walls- great resource for learning about the plants that work best
Native Texas Nursery	located in Austin. Texas. Can ship to Denton. Online and in person purchases
Meador's Garden Center & Landscaping	located in Denton, Texas. Provide planting service if needed. Online and in person purchases.
Painted Flower Farm	Located in Denton, Texas. It has lots of native plants and host plant options.

SPENDING

Spring total spent: ~ 300
Remaining funds: ~ $1,300

A lot of supplies were used/borrowed from the Elm Fork Education Center's supplies.

The remaining funds will be used to purchase plants, 3D printing material if needed, soil, and other supplies for experimental green walls.

SOURCES & CASE STUDIES

Will be provided in final report

We Mean Green Wall Workshops

SPRING 2023 DATES

You are invited to participate in a workshop series funded by the UNT We Mean Green Fund aimed at exploring the intersections of art, nature, and multidisciplinary collaboration.

Workshop 1

Monday, March 20th & Thursday, March 23th **6:30 - 7:30 PM**
Environmental Science Building 176

We will introduce green walls, investigate the importance of nature & art in urban environments, and go through a design exercise focused on the shape, and color of plants in a green wall.

Workshop 2

Monday, March 27th & Thursday, March 30th **Come & Go 6 - 7:30 PM**
Environmental Science Building 180

By using various natural elements such as moss and wood, participants will practice design skills learned in workshop 1 to create a small preserved moss wall. Moss walls can be taken home.

Workshop 3

Monday, April 17th & Thursday, April 20th **6:30 - 7:30 PM**
Location TBD

Participants will design, and fabricate a small portable green wall with living plants. This experiment will provide information to support a larger green wall at UNT in the future. 3D modeling & printing involved!

Sign up

To ensure we have enough room and supplies, please sign up for any of the workshops you plan to attend.
Any event updates will be emailed to you.

Faculty/staff/students from all departments, majors, backgrounds, etc, are welcome and encouraged to participate. **Invite your friends to sign up!**

https://bit.ly/MGWSignUp

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We Mean Green Fund

We Mean Green Wall Workshop Series

Art & Nature in the Urban Environment

WORKSHOP 1

Join us for the first workshop in the We Mean Green Wall Workshop series were we will

- Introduce green walls
- Study plant characteristics
- Start thinking creatively about art and nature through a design exercise.

The purpose of this event is to learn and create something new together.

Everyone is welcome! You do not need to be artistically talented to participate.

SIGN UP TO PARTICIPATE!

Monday, March 20 & Thursday, March 23
FROM 6:30 PM - 7:30 PM

Environmental Science Building Room 176

https://bit.ly/MGWSignUp

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We Mean Green Fund

We Mean Green Wall Workshop Series

An Evening with Moss

WORKSHOP 2

Join us for the second workshop in the We Mean Green Wall Workshop series were we will design and create preserved moss walls!

You can take home your design!

Everyone is welcome! You do not need to be artistically talented to participate.

SIGN UP TO PARTICIPATE!

Monday, March 27 & Thursday, March 30
FROM 6:00 PM - 7:30 PM
COME AND GO

Environmental Science Building Room 180

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