



WPI

From Cafeteria to Compost:

Sustainable Food Waste
Management at WPI



**Project Submitted to WPI's 15th
Annual Sustainability Showcase**

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OUR TEAM:



The **WPI Green Team** is a student organization that aims to promote a sustainable environment at WPI and in the Worcester community.

We are part of the **Waste Management Subcommittee** working under Green Team.



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THE PROBLEM

WPI generates lots of food waste

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OUR MISSION:

To reduce food waste and increase sustainability

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OUR PLAN:

Our 3 main projects

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NEXT STEPS

Our plan moving forward

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THE PROBLEM

Food waste & its significance



THE PROBLEM:



Millions of tons of food are wasted on college campuses each year.

which ultimately ends up in **landfill**.



SIGNIFICANCE:



This is not only a waste of money and resources, but it also contributes to **greenhouse gas emissions** that worsen **climate change**.



CLIMATE CHANGE



Food waste generates **methane** (CH₄), a greenhouse gas 28x more potent than CO₂

- **Increased food waste** → **increased methane** in the atmosphere.
- Methane acts as a blanket that traps energy from the sun's rays, retaining heat and **warming the atmosphere**, thereby **exacerbating climate change**.

IMPACTS OF CLIMATE CHANGE ON THE PLANET



- According to NOAA, global temperatures **increased 1.1 Celsius** from 1901 to 2020.
- A domino effect:
 - Melting/shrinking of polar ice caps → **rising sea levels**
 - Changes in weather patterns (**more droughts, flooding**)
 - Less snow/rain in winter months → drought in summer
→ **affects agriculture & food supply**
 - Ocean becomes more acidic → coral bleaching → **biodiversity decline**
 - Increase in **natural disasters**



THEREFORE,



It is **vital** we take
actions now
before it's too late!



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OUR MISSION:



OUR GOALS:



University Spectrum:

1. To **minimize food waste** at dining halls to raise awareness for sustainability.
2. To **encourage composting** within the university dining halls and Greek life organizations to promote environmentally-friendly habits.

Global Spectrum:

1. To **reduce greenhouse gas emissions** that contribute to climate change
2. To **conserve resources** (energy, water, land) that are vital to food production
3. To **preserve biodiversity** by reducing food that ends up in landfill



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OUR PLAN:



OUR PROJECTS:



**1. Project
Zero Waste**

**2. University
Composting**

**3. Greek Life
Composting**

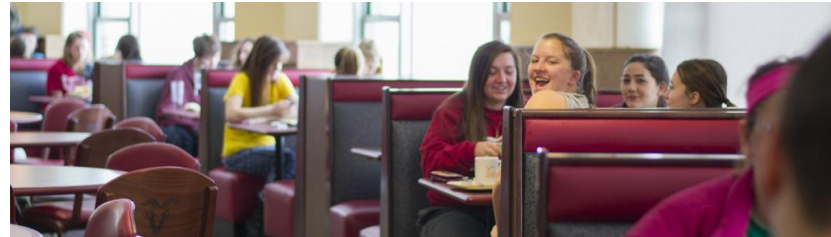


Project Zero Waste

Objective: To reduce food waste at Morgan Dining Hall (MDH) by 5% each semester.

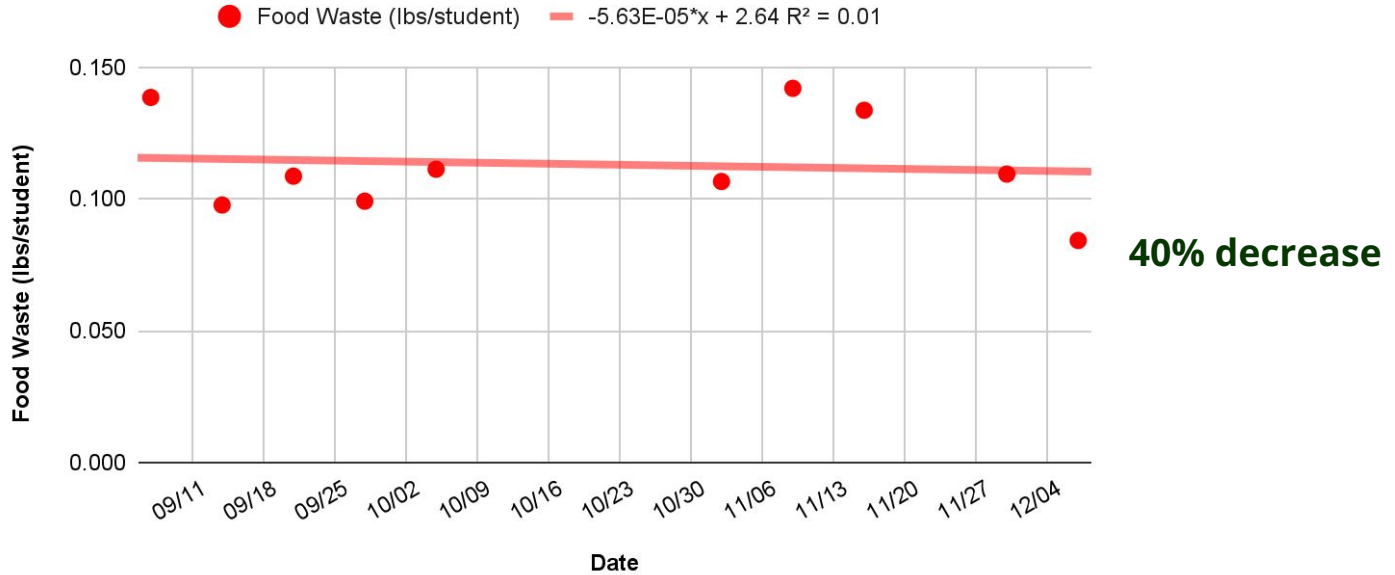
Protocol:

1. Measure the amount of food waste (lbs) in Morgan Dining Hall every Wednesday during lunch hours (11am - 2pm).
 - Food waste is collected in a large container and weighed using a scale.
2. Green to-go boxes are tallied per hour and removed from count.



Project Zero Waste

Food Waste Per Student vs. Time (Fall 2022)



Project Zero Waste

Significance of Project:

1. Students will be **more aware of the food waste** they are generating and the impacts that food waste impinges on the environment
2. 5% food waste reduction can **significantly reduce CH₄ emissions & CO₂ emissions**
(reducing the frequency of transportation to dispose the food waste)



University Composting

Objective: Propose to initiate composting at the **South Village Campus Center (SVCC) Dining Hall** in the 2023-2024 academic year.

Protocol:

- Plan: Setting up waste receptacles, switching to compostable materials, putting up appropriate composting signage.
- Compost collection would occur 2x / week at the SVCC loading dock
- Requirements for compost: no plastic contaminants or chemicals



University Composting

Partnering Composting Service:



Location: Grafton, MA

Logistics:

- Collect food scraps for universities
- All-in-one program & minimizes extra work for WPI custodial staff

Process:

- Pickup once per week, 2 containers/week (112gal)

Cost:

- \$50/pickup + \$50 one-time fee → \$50/week
- (\$1,600 / academic year)

University Benefits:

- Generate compost for WPI community garden



University Composting

Alternatives Considered:

Feedback Earth	Green Mountain On-Campus Vessel
<ul style="list-style-type: none">• More expensive• Scalability• Reliability	<ul style="list-style-type: none">• Requires staffing• Long term costs of running machine & carbon feed• Initial cost is very expensive (\$300,000)



University Composting

Current Metrics:

Dining Hall	# of 50-Gallon Drums	% Full	Total Weight of Drums (lbs)
Morgan	11	75	4400
Campus Center*	2	75	800
Goat's Head*	1	75	400
		Total	5400

Food Waste Production:

- Over the entire ~32 weeks in the primary academic year the university produces roughly 172,800 pounds of food waste.

Note: Food collection at CC and Goat's Head is not the same level as that at Morgan. Thus, these numbers are severely deflated.



Greek Life Composting

Objective: To implement **vermicomposting** at each of the WPI Greek Life (fraternity & sorority) houses.

Significance:

- Food waste reduced in 16 Greek Life houses (**over 200 people**)
- Through demonstrating a commitment to sustainability, Greek Life organizations can **inspire other university organizations to join the good cause.**



Greek Life Composting

What is Vermicomposting?

- the process of decomposing organic material using worms

Comparisons:

Traditional Composting	Vermicomposting
<ul style="list-style-type: none">● Bacterial breakdown of organic waste● Need to maintain ratio between "browns" and "greens"● More effort/cost required<ul style="list-style-type: none">○ Mix compost pile frequently○ Buy browns frequently to add	<ul style="list-style-type: none">● Using red worms to breakdown organic waste● Faster & more efficient● Minimal space needed - boxes could be stacked!● Minimal effort● Worms might not be able to eat certain wastes



Greek Life Composting

Background on Worms:

Feeding:

- To feed: coffee grounds, food scraps, napkins, shredded paper, tea bags, etc.
- To NOT feed: dairy (milk, cheese), excessive citrus, outer layers of onion, bread, etc.

Where to buy & costs:

- Uncle Jim's Worm Farm
- 1000 adult red worms = \$55.00 (~ 1 lb)



Worm Facts:

- 1-3 inches in length
- 1000 count of red composting worms can create between 8-16 oz of compost per day



Greek Life Composting

Container: 25 Gallon Box (\$27 - Lowes)



Depending on the size of the Greek house, each chapter will need to buy X # boxes per 5 people in the house

Recommendations:

- Start with 2 boxes, and increase if needed
- Start with ½ lb of worms to be safe - worms usually don't like the new environment

Estimated Cost:

- Cost is dependent on the size of the house

Assuming 2 boxes (\$54) + 1000 worms (\$55) = \$109

Note: Buying the box & worms is one-time investment



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NEXT STEPS



MOVING FORWARD,



1. Find funding for **University Composting**, working with Black Earth Compost.
2. Present ideas to Greek Life, and initiate **Greek Life Composting** by this D-term or beginning of next academic year.
3. Continue **Project Zero Waste** to keep track of food waste to raise awareness!



REFERENCES:



- [Food Waste and its Links to Greenhouse Gases and Climate Change | USDA](#)
- [Climate change impacts | National Oceanic and Atmospheric Administration \(noaa.gov\)](#)
- [Impacts of Climate Change | US EPA](#)
- [Black Earth Compost](#)
- [FeedBack Earth, Inc | Food Waste Transformation | Grafton, MA](#)
- [Green Mountain Compost - Local, sustainable, wicked good](#)
- [Buy Red Wigglers Worm Composting and Vermicomposting supplies \(unclejimswormfarm.com\)](#)





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THANK YOU

