

**Name:** Harry Steinberg

**Is this a project that you will work on alone, or will you collaborate with others? If you are collaborating with others, list their names, their Tufts affiliation, and their contact emails. Please indicate which member of your team will be the principle contact.**

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**Please provide a 300-350 word description of your project**

We propose a project that would create a system of rain barrels on the Medford-Somerville campus, which would collect and sequester rainwater for use in watering the Tufts lawns and/or community gardens, as well as other potential water-providing applications. This rain barrel system would provide additional water supply to Tufts, thereby reducing our public water intake and the energy necessary to pump and distribute the water. Additionally, the rain barrels would collect excess water from rainstorms that can be seen running down Tufts' hilly campus and creating large, unattractive poolings of water. This runoff is also known to cause erosion and carry contaminants into the watershed, as dispersion into the soil is prevented by the ubiquity of impermeable asphalt surfaces on the Medford/Somerville campus. The rain barrels will collect this rainwater and reduce this excessive and potentially harmful runoff. The rainwater captured would be used to water the community gardens and green spaces covering the majority of campus. Beyond supplying water to the natural green spaces on campus, the bodies of the rain barrels themselves would provide beautification and activism opportunities for student groups on campus. We plan to partner with the newly-formed Activism Coalition to create an interactive, campus-wide eco-art collaboration. Each barrel would be an opportunity for an activist group on campus to decorate and paint the barrels with visual art and/or information pertaining to water conservation awareness campaigns. Additionally, the barrels would provide an educational enrichment opportunity to Tufts Civil and Environmental Engineers to learn more about the water transportation system on our campus and play a role in water distribution. We hope that this project can be part of a larger, nationwide movement on campuses to address water usage. In summation, this project is an engagement for the Tufts community in conservation, awareness, activism, and community-based waste reduction.

**What is the problem that you are looking to solve?**

As major institutions, universities like Tufts use a massive amount of water, much of which goes toward watering the expansive green-spaces that make our campus beautiful. Currently, Tufts is using filtered, treated water from the tap to water the grounds, which is wasteful in terms of cost, energy, and clean water itself. The Greater

Boston area receives 47 inches of rainfall yearly, nearly ten inches more than the national average. We have a natural alternative that we should be harnessing for our water needs. Moreover, runoff from uncaught rainwater can cause problems in local watersheds through the flow of contaminants. Tufts' campus is especially at risk for generating contaminated runoff due to the concentration of people and the use of fertilizer. Treated tap water has been shown to cause decreased growth in grass and plantings as compared to those watered with natural rainwater.

**Has this been done before? How is this project different?**

No.

**How will you measure success?**

As this is a multifaceted project, we will measure project success in relation to our goals outlined at the outset. Categorically, these include: Water conservation goal: Tufts currently has no initiatives in place to save water, so any water conserved is a success! We will strive to maximize the contribution of the rain barrels into the university's total water-use profile, aiming for at least 1% once the project is fully integrated. Social activism and awareness goal: We will confer with the Activism Coalition on measuring impact, and could potentially see success reflected in perception of Tufts' social justice engagement, measured through surveys and other tools. Runoff reduction goal: We plan to test the collected rain barrel water for various contaminants, and will view the sequestering of these contaminants instead of entry into the Mystic River watershed as a success.

**How many people would this project impact? Please categorize them as students, faculty, staff, and other**

This project will impact every user on the Medford/Somerville campus since the project will reduce water consumption to water vegetation on campus. More specifically, when done in collaboration with facilities this will help reduce their labor in terms of replanting grass when eroded. By harnessing natural powers, man-made labor will be reduced. Further, students and other community members will be educated on-going activist work related to water.

**What is the environmental impact?**

Runoff from uncaught rainwater can cause problems in local watersheds through the flow of contaminants. Tufts' campus is especially at risk for generating contaminated runoff due to the concentration of people and the use of fertilizer. Therefore by reducing excessive uncaught rainwater, we are reducing the flow of harmful contaminants. Additionally, treated tap water has been shown to cause decreased growth in grass and plantings as compared to those watered with natural rainwater.

**What are the educational impacts of this project?**

There is a large educational impact of this project for the Environmental and Civil Engineers at Tufts to learn about water storage and distribution infrastructure as well as the greater Tufts community to learn about water consumption and conservation.

**What is the social impact (excluding educational aspects)? (e.g. alleviating climate injustice, community resiliency, culture change, equity, etc)**

We hope that the eco-art collaboration with the Tufts Activism Coalition will provide a forum for public education and awareness on water conservation issues. Moreover, we believe that a public, university-sponsored water conservation display will spur students and community members. As we mentioned in the proposal, this project will allow Tufts to be more prepared for potentially harmful rainstorms. Further, we hope to combat labor injustices, which is deeply connected to climate injustice, on Tufts campus by reducing facilities work after rainstorms.

**Will it help Tufts meet its sustainability goals? If so, how?**

This will help Tufts meet both its Waste Reduction and Energy Reduction goals. As mentioned previously in the proposal, using rain barrels reduces the amount of water Tufts uses from the municipal water source. This reduces the amount of energy required by water pumps.

**What are the life cycle cost savings or the immediate cost savings, if applicable?**

By implementing a system of rain barrels Tufts would spend less money on irrigating green spaces. By sequestering gallons of water, rain barrels would also decrease erosion caused by flooding and rapid runoff. Runoff sequestration could be especially beneficial in preventing erosion given Tufts' abundance of impervious surfaces and the downward slope of our campus. Rain barrels would help Tufts save money on what might otherwise be spent on maintaining soil cover and curbing erosion.

**How much funding are you requesting from the Green Fund? Are you seeking funding from other places?**

We are requesting \$10,000 from the Green Fund. We are not seeking funding from other places.

**Who would maintain the barrels?**

There are three possibilities for maintaining the barrels:

1. Tufts Eco Reps
2. Facilities workers
3. Rain Barrel project team

Ideally, the rain barrels will be maintained by the Tufts Eco Reps. A meeting with the Eco-Rep coordinator will determine the viability of that option. In the event that the Tufts Eco-Reps are unable to maintain the rain barrels, it's a possibility that Tufts facilities workers will be able to step in. A meeting with Tufts Facilities in the next few weeks (before winter break) will determine the viability of that option.

If both the Tufts Eco-Reps and Tufts Facilities workers are unable to provide maintenance, the rain barrels project team will be able to step in and provide maintenance for at least the first year of operation. This solution would be temporary, and the project team would continue investigating more permanent solutions during that period.

### **Where would the barrels go in the winter?**

Consultation with the civil and environmental engineering departments (specifically professor Anne Marie Desmarais) has led us to conclude that the best year-round strategy for the barrels would be an annual winterization before the first freeze – a relatively simple process. This would entail disconnecting each barrel from the source, opening the spout, draining the water inside, and flipping the barrel upside down. This process would take an estimated 5 minutes for each barrel and could be easily organized as an event by those chosen to maintain the barrels. Barrels will already be situated directly adjacent to university buildings, a relatively protected location away from plows, etc.

Alternatively, there may be space for the barrels outside the waste facility in the parking lot across from Halligan Hall and the Cousens Athletic Complex. However, this option is significantly less preferable, as it would require much more work on the part of those maintaining the barrels.