

View results

Respondent

29

Nicolas Ramkumar

16:19

Time to complete

### Instructions:

Please adhere to the session word counts. Project leads must attend one SSC working group meeting post step 1 application submission. If you have any questions about the application process, please contact the SSC at [Sustainability-Committee@illinois.edu](mailto:Sustainability-Committee@illinois.edu).

1. Have you attended an SSC working group meeting? If not, please attend an SSC Working Group and present your project. Once working group attendance is complete, please return to complete your application.

<https://studentengagement.illinois.edu/student-sustainability/ssc/calendar/>

\*

Yes

No

2. Please enter the date of the working group meeting you attended. As a reminder, the working group meetings are structured as follows

- Energy + Transportation and Infrastructure working group.
- Food & Waste + Land, Air, and Water working group.
- Education and Justice working group.

\*

Food & Waste + Land, Air, and Water working group on 2/6/2024

3. Date of Application \*

02/09/2024

4. Project Name: \*

Climate Change in your Neighborhood

5. Total Funding Requested From the SSC. \*

9704

Please enter a number less than or equal to 10000

6. Project Lead Full Name: \*

Nicolas Ramkumar

7. Project Lead University Email Address \*

namkum2@illinois.edu

## 8. Project Abstract: (In less than 100 words, briefly describe the project.) \*

Urban green spaces planted with diverse native and other beneficial vegetation are an important tool to mitigate the impacts of climate change such as heat, flooding and poor air quality. Many areas in urban and suburban landscapes are planted with nonfunctional turf grass or continuously mowed. We plan to investigate the differences between spaces with vegetation versus mowed spaces in urban landscapes by looking at metrics such as temperature, air quality, biodiversity, and soil quality. Our hypothesis is that spaces with turf will be less "environmentally healthy" and possess higher temperatures, humidity, poor air and soil quality and less biodiversity.

## 9. Project Category \*

- Education & Justice
- Energy
- Food & Waste
- Land, Air & Water
- Transportation & Infrastructure

All rolling application require a faculty/staff advisor.

Faculty and Staff Advisor

## 10. Full Name: \*

Brenda Wilson

## 11. RSO/Department \*

Molecular & Cellular Biology

## 12. University Email Address: \*

wilson7@illinois.edu

## 13. Do you have additional members? \*

- Yes
- No

## Project Team Member

Additional Member

## 14. Full Name: \*

Keya Patel

## 15. RSO/Department \*

Bioengineering

## 16. University Email Address: \*

kpate418@illinois.edu

17. Do you have additional members? \*

- Yes
- No

### Project Team Member

Additional Member

18. Full Name: \*

19. RSO/Department \*

20. University Email Address: \*

### UIUC Financial Contact

Financial Contact (Must be full-time UIUC employee)

21. Full Name: \*

22. RSO/Department \*

23. University Email Address: \*

### Project Questionnaire:

24. Is this project student led? \*

- Yes
- No

25. If applicable, have you received approval from Facilities & Services and/or site manager? \*

- Yes
- No
- N/A

26. If additional funding is required, do you have a plan for ongoing funding beyond SSC? (SSC cannot guarantee ongoing financial support) \*

- Yes
- No

27. Beyond SSC, do you have sources contributing funding or support (ex. staff time, external grants, etc.) to this project? \*

- Yes
- No

28. Have you applied for SSC funding previously? \*

- Yes
- No

29. Project Timeline:

(SSC funding agreements remain active for two years. List your project's timeline and major milestones.) \*

To date, we have completed a literature review on existing research in similar areas to what we are studying. We have completed a protocol for our project, outlining the methodology we will use for collecting data, as well as contingencies for unexpected events. We will collect data from May 1st to September 1st 2024, and start our analysis and sequencing process after that, ending in December. During the fall semester, Nicolas will have graduated, but Keya will be in her senior year. We aim to start writing a research paper in 2025 and submit it to journals afterwards. During this time, we will begin to recruit students to continue this project. After the completion of our project, the equipment used for our study will be given to the Wilson Lab, with Dr. Wilson mentoring future student-run project continuations.

30. Project Description:

(In 250 words or less, describe your project. What does your project hope to accomplish? What are your project's deliverables?) \*

Climate change and biodiversity loss resulting in heat waves, flooding, and worsening air quality impacts human and planetary health. From our literature review, we have found that increasing urban green spaces with native and other beneficial vegetation are nature-based solutions (NBS) that communities can use to reduce the impacts of climate change and improve biodiversity. Our project aims to examine the difference between spaces with native/not native vegetation and conventional urban spaces that tend to contain nonfunctional turf grass or are continuously mowed. For our study, we plan to look at metrics such as temperature, air quality (VOCs, PM1, PM2.5, PM 10), biodiversity index above and below the ground, and soil quality in terms of water retention capacity. We hypothesize that NBS with increased vegetation will be beneficial in terms of less heat, flooding, better air quality which will lead to improved human and planetary health outcomes, protect infrastructure and build resilience in our communities. This pilot study and the results obtained can be used for further investigation in different disciplines concerned about climate change mitigation through increased green spaces. There is applicability in fields such as urban planning and medicine in connecting climate change, human and planetary health impacts and mitigation strategies. In our increasingly urbanized communities, we hope to educate community members on this issue so that they can participate in diminishing the effects of climate change as much as possible. The results of this study will be open source and disseminated to students and the community.

31. Environmental Impact:

(In 200 words or less, how does your project increase environmental stewardship at UIUC? If applicable, what is the carbon, water, waste, and/or energy savings?) \*

This project increases environmental stewardship by increasing awareness in our community on: i) the impacts of climate change such as heat, flooding and poor air quality in their own neighborhood and ii) the benefits of urban green spaces planted with diverse native and other beneficial vegetation as a NBS to mitigate the impacts of climate change. Understanding these impacts and mitigation strategies can help make UIUC more sustainable. There are many areas of nonfunctional turf grass and mowed spaces that might not be the most environmentally viable option. Potentially, the results from our findings could help us better understand how to improve landscaping on campus. By opting to plant beneficial vegetation throughout campus, this could not only reduce the environmental impact, but aid the health of students, faculty, and staff. Eliana Brown, one of our faculty mentors with the extension office, is particularly interested in this project and the applicability in promoting more urban green spaces, the importance of biodiversity, mitigating climate change effects, and human health outcomes. With the results of these studies, communities can take mitigation of climate change into their own neighborhoods by reducing mowed spaces with native and beneficial plants to improve human and planetary health.

32. iCAP Objective Correspondence:

(In 200 words or less, does your project aim to advance one or more of the Illinois Climate Action Plan's (iCAP) objectives? If so, how?)

A full list can be found here: <https://icap.sustainability.illinois.edu/objectives>

We believe that our project advances iCAP objective 7.4: "Incorporate sustainability-related problem solving in the GivePulse system for public engagement, and track local collaborations for sustainable solutions. Increase local collaborations by 10% per year from FY22 to FY24." The site we chose to study is off campus in Robeson Meadows, a suburban neighborhood in Southwest Champaign. We chose to examine this site because over the past decade, local residents have been planting commons areas with trees and native plant species. When we reached out to the homeowner association for permission to conduct our study in these commons areas, they were excited about research being conducted in their neighborhood and in the outcomes. The enthusiastic response from residents reflects a genuine commitment to fostering a sustainable and resilient community. By focusing on an off-campus location, the project extends beyond the university's borders, embodying iCAP's vision of local collaborations that transcend institutional borders. The study not only benefits the academic community but directly addresses the concerns of local residents, bridging theoretical knowledge and practical, community-driven sustainability solutions. We believe that this is the kind of "co-curricular sustainability partnership between students and community groups" that iCAP objective 7.4 is seeking.

33. Student Impact:

(In 200 words or less, how will this project benefit students? How will students be involved with this project? What educational components are in your project?) \*

Our project is student-led in all stages, from planning and data collection to analysis and presentation of findings. Through fieldwork, we will learn practical skills in environmental monitoring and develop a deeper understanding of climate change and mitigation strategies. The project integrates various educational elements, including environmental science, biology, microbiology, data science, and community engagement. We will learn to analyze air and soil quality, interpret biodiversity metrics, sequence microbe genomes, and draw connections between our findings and broader climate change impacts. We will explore the importance of urban green spaces in improving urban environments by decreasing temperatures, improving air quality, flood-risk reduction, and increasing biodiversity. This will provide us with a more holistic understanding of the benefits of the ecosystem services provided by urban green spaces to mitigate against the impacts of climate change, improve human and planetary health, protect infrastructure and build resilience in our communities. Additionally, future students will have the opportunity to expand on the work conducted in this study. This ensures ongoing student involvement and research opportunities, with the possibility to explore new environmental metrics, different study sites, or expanding current research areas. Students continuing this project will receive MCB 290 credit for undergraduate research.

34. Please see attached file, please be very descriptive and fill out the budget and timeline Excel sheet, and submit it below.

<https://studentengagement.illinois.edu/student-sustainability/ssc/docs/SSC-Supplemental-Budget-Timeline.xlsx>

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 SSC-Supplemental-Budget-Timeline (1). Nicolas Ramkumar.xlsx