

Campus Sustainability Fund Spring 2022 Annual Grant Proposal Application

Thank you for your interest in the new Campus Sustainability Fund! This application form may be used to apply for Spring 2022 Annual Grant funding in amounts from \$5,001 - \$100,000 through 5 PM on March 31st, 2022. Only applications that include thorough and thoughtful responses will be considered. Incomplete proposals will not be reviewed.

Please review our Spring 2022 grant information, including our eligibility and evaluation criteria here: sustainability.arizona.edu/csf

Please have a completed budget sheet ready to submit before starting this application. The template can be found here: <https://arizona.box.com/s/23d2mtihkkrx95c42luhk4k5omtqrwt>. After opening the link, click "Download" at the top right corner and it will download as an Excel Sheet.

All character limitations within this proposal include spaces.

For approved projects to receive funding, the project's department must have a STDFEE account as CSF funding can only be transferred to another STDFEE account. If your project's department does not have a STDFEE account set up, we recommend that it be a 265XXXX account. Although not required, we encourage you to use the same range to match the Sustainability Fee account: 2657605. Approved proposals will also be required to complete the Campus Sustainability Fund's Letter of Agreement before funding is dispersed where more details on this will be provided to the Fiscal Officer.

All funding must be used by the end of fiscal year 2023 (June 30, 2023). Unused funding as of this date will be returned to the Fund for reallocation for future funding opportunities.

** Please contact emilyhaworth@arizona.edu for questions, help in completing the budget template, or any other issues. **

Email *

egornish@email.arizona.edu

Contact Information

Each project proposal requires a primary and secondary project manager as well as a fiscal officer. If the primary project manager is a student who graduates in May 2023, the secondary project manager must be a staff or faculty member OR a student who graduates AFTER May 2023.

Projects where the primary and secondary project manager are both students require the involvement of a staff or faculty member within the applicable department.

Primary Project Manager Name *

The primary project manager is responsible for completing this application, answering questions posed by the Campus Sustainability Fund's Committee, and completing all required reporting on project progress and outcomes.

Elise Gornish

Primary Project Manager Status *

Student

Staff

Faculty

Other:

Primary Project Manager Email *

egornish@arizona.edu

Primary Project Manager Department Name *

School of Natural Resources and the Environment

Secondary Project Manager Name *

The secondary project manager is responsible the back-up for the primary project manager if they are unable to complete any of the requirements of the Campus Sustainability Fund, particularly completing required reporting on project outcomes.

Katy Prudic

Secondary Project Manager Status *

Student

Staff

Faculty

Other:

Secondary Project Manager Email *

klprudic@arizona.edu

Secondary Project Manager Department Name *

School of Natural Resources and the Environment

Departmental Employee Contact Name *

Projects where the primary and secondary project manager are both students require the involvement of a staff or faculty member within the applicable department. The departmental employee contact must be a staff or faculty member within your department who is responsible for monitoring the project's budget and reporting if both project managers are unavailable. If this does not apply to you, type N/A for these responses.

Elise Gornish

Departmental Employee Contact Email *

egornish@email.arizona.edu

Departmental Employee Contact Department Name *

School of Natural Resources and the Environment

Fiscal Officer *

The fiscal officer is a staff member within your department who is responsible for financial transactions and who will support reporting by pulling requested expenses against awarded funding and ensuring that funding is spent within awarded categories.

Lynn Frasier

Fiscal Officer Email *

lef1@arizona.edu

Fiscal Officer Department Name *

School of Natural Resources and the Environment

Tell Us About Your Project

Official Project Name *

Please be specific but concise as this name will appear on reports and our website. Creativity is encouraged!

Native plant garden installations across UArizona to reduce water and energy use, and engage students

Requested Funding Amount *

Please enter this amount after completing the budget sheet and populate the total amount here. If you are requesting multi-year funding, please format it as the following: \$67,800 (FY23), \$60,200 (FY24), \$50,400 (FY25)

99,800

Primary Project Category *

Please select one category that best encompasses the nature of your project.

- Water
- Energy
- Waste
- Transportation
- Food
- Social Sustainability (including Social/ Environmental Justice)
- Natural Environment
- Campus Life (Health & Wellbeing, Behavior Change)
- Research and Academics
- Carbon Reduction
- Art
- Built Environment
- Policy

Secondary Project Category *

Please select a secondary project category. If not applicable, select the same category again.

- Water
- Energy
- Waste
- Transportation
- Food
- Social Sustainability (including Social/ Environmental Justice)
- Natural Environment
- Campus Life (Health & Wellbeing, Behavior Change)
- Research and Academics
- Carbon Reduction
- Art
- Built Environment
- Policy

Background and Context *

Please provide any relevant background about your organization/team including your mission and/or expertise. Please also lay out the rationale for the proposed project such as context on the issue that your project would address. This section is meant to give us more information about you, while also giving you more space below to talk toward your proposed project. Responses are limited to 3,000 characters including spaces.

Dryland systems, like the desert of Tucson where the University of Arizona calls home, are experiencing rapid changes in climate including extreme drought and heatwaves. The negative biological effects of these changes highlight the critical need for communities and the institutions that compose them to adapt to hotter, dryer environments. This includes the reduction of water use, implementation of urban cooling infrastructure, and engagement of community members to ensure maintenance and support of such adaptations. UArizona is not immune to environmental changes and has attempted to address these changes through sustainable actions in many ways, which include the construction of LEED designed buildings; support of alternative energy research; and low waste programs such as Recyclemania.

Despite the impressive efforts deployed by UArizona to adapt to a changing environment, there remain challenges to campus sustainability. For example, many university buildings are surrounded by a non native grass landscape. A very general assessment of lawn cover using google earth suggests there are over 2 square miles of non native lawn associated with university-associated building on and off campus! These lawns require much more water to maintain 'optimum performance' (e.g. looking nice and green) compared to native plants. Certainly, lawns in particular areas, such as the continuous one flanking Old Main, can be important for aesthetic as well as safety purposes and don't necessarily need to be replaced. However, serious considerations should be made for the many other parcels of lawns across campus that provide zero resources to pollinators and other wildlife while absorbing huge amounts of water.

Other areas of campus suffer from a lack of plants. These non-pedestrian, non-parking areas just outside of campus buildings appear to be bereft of plants, and are thus composed of only bare soil or concrete. These bare areas are particularly problematic for the university because they trap heat. Pavement and bare ground absorb and retain heat more than a plant canopy does. This retained heat ultimately leads to increasing energy demand. This is not only highly environmentally unsustainable, but incredibly costly to the university as well.

The UArizona Ecological Restoration club has attempted to address these challenges. The Ecological Restoration club is a student run club on campus (PI Gornish started the club and is the faculty mentor) with 74 members (approximately 25-35 members attend bi monthly meetings). In 2019, the club started deploying native pollinator gardens on campus. The goal of these gardens was to fill in bare space on campus with drought tolerant, fast growing native plants that could reduce the heat island effect while providing a diversity of floral resources (both in time and in space) to pollinators, including the critically endangered monarch butterfly. This proposal attempts to expand on this effort.

Project Description *

Please provide a description of your project. Please include information on the need your project fills and how it does so. Include objectives, an anticipated timeline, and expected impact(s). Responses are limited to 3,000 characters including spaces.

Objective 1. Replace 25 parcels of bare ground or lawn with drought tolerant native plant gardens.

Objective 2. Engage student learning about garden effects through signage, outreach and the development of a new CURE (course-based undergraduate research experience) that focuses on research associated with the gardens.

Anticipated timeline

2022

August – September: Meetings among grant members; Office of Sustainability and Facilities Management to identify garden locations; create potential species lists; create subcommittees (outreach, planting, etc.); create and submit CURE course

October – December: Create planting plans; purchase first set of plants; initiate signage creation; advertise CURE course

2023

January – May: Install five gardens and signage; meet with project partners to share ideas; host first outreach event

June – August: Plan outreach events; publicize gardens on social media, blog posts and newsletters; install three gardens

September – December: Teach first CURE semester; install five gardens and signage; engage committees; host second outreach event

2024

January – May: Teach second CURE semester; install five gardens and signage; host third outreach event; meet with project partners to share ideas

June – August: Plan outreach events; publicize gardens on social media, blog posts and newsletters; install two gardens

September – December: Teach third CURE semester; install five gardens and signage; host fourth outreach event

2025

January: Project partner final meeting and prepare new grant proposals

The proposed project has several anticipated impacts.

1. Pollinator gardens will replace heat attracting bare soil to eventually reduce the so-called urban heat island effect, subsequently reducing locally raise temperatures by as much as 8°, ultimately reducing an energetic need for local building air conditioning. Water reductions of up to 100% to gardens one year after installation is also expected.
2. Garden installation will engage UArizona undergraduate and graduate students directly. Previous garden installation engaged over 48 students and we anticipate at least 70 students being involved in garden installation. Moreover, signage will help attract attention to the gardens by the general student body. Without signage, previous gardens attracted attention: recently, club members noticed that someone had 'guerilla planted' a pomegranate tree in one of the gardens. Moreover, invited speakers to the SNRE weekly seminar series will be treated to a short tour of the gardens by club members as has been done in the past.
3. We expect at least 10 students to be involved in the CURE each semester, for a total of 40 students directly engaged with sustainability research.

Project Summary Snapshot *

Please provide a short summary of your project. This summary will be used on our new website and other Office of Sustainability materials, if approved. Think of this as a hyper-concentrated summary limited to just a few sentences. Responses are limited to 800 characters (~60-100 words).

UArizona student members of the Ecological Restoration club, HydroCats and Compost Cats will install native plant gardens across campus to replace water hungry lawns and bare spaces that contribute to the urban heat island effect. These gardens will enhance campus sustainability by reducing water and energy use while providing critical resources to local pollinators and beautify campus. Signage at the gardens will educate students about their value and a newly developed CURE (course-based undergraduate research experience) will provide opportunities for data collection across the gardens.

Project Feasibility & Logistics *

Please provide a description of the work that has been completed so far to make this project feasible. Have all relevant partners been contacted/coordinated with? Please identify them in your response. Have you received reasonable quotes for supplies? What research has been completed to lay the foundation for this project? Proposals that have not thoroughly pre-planned may be rejected outright. Responses are limited to 3,000 characters including spaces.

Since 2019, three gardens have been installed in previously bare basins around the Bio Sciences West building. The club worked with PIs Gornish (a specialist in ecological restoration) and Prudic (a specialist in pollinators and their habitats) in addition to well-known restoration local practitioner C. Funicelli to develop an ideal plant list to achieve the goals of: rapid colonization of bare sites (plant traits: high survivability and rapid growth) and pollinator resources available throughout the year (plant traits: large flowers, high nectar output, blooms at different times of year). Members of the club then worked with campus Facilities Management to ensure that basins would be irrigated in the first year to enhance survival of transplants. Almost 100% of installed plants are thriving and since installation, supplemental irrigation has been significantly curtailed. Moreover, pollinators and their predators are regularly documented visiting the gardens.

Potential location of gardens (both bare areas and lawns) have been identified (e.g. Life Sciences South, Physics-Atmospheric Sciences, Mathematics, Mathematics East, Roy P Drachman Hall, Keating Bioresearch, Arizona Health Science Center, Campus Health, El Portal, Apache-Santa Cruz Residence Hall, Biological Sciences East, Henry Koffler, Key Desk, Engineering, Communication, Richard A. Havril). Upon funding, PIs will identify locations of gardens through discussions with restoration club members, and individuals from the Offices of Sustainability and Facilities Management. Species lists will be created through discussions with all collaborators and plants will be purchased from native nurseries. Approximately, every other month, one garden will be installed (previously, gardens have required approximately eight days of set up and two days of installation). Compost from Compost Cats will be deployed on half of all gardens, providing an experimental framework in which to embed the new CURE.

C. Funicelli is very experienced designing and deploying native plant gardens. Both she and PI Gornish have strong connections with local native plant growers who can provide suitable native plants for the gardens. Often, these nurseries are also happy to donate a few plants as well.

Environmental Sustainability Outcomes *

Please provide a brief description of how you expect your project to advance environmental sustainability on campus. Responses are limited to 3,000 characters including spaces. A definition of environmental sustainability is provided in our Spring 2022 Information.

Since installation, all three existing gardens have grown, attracting not only a variety of pollinators (bees, butterflies and hummingbirds) but their predators as well (functioning ecosystems are an excellent benchmark of restoration success). Critically, installed plants are now big enough that irrigation to all basins can be shut off as the plant community can now survive with only ambient rain. These gardens now save water for the university as well as cool the immediate surrounding areas.

We expect that installation of a large number of gardens across campus will achieve similar sustainability outcomes. Specifically, we expect that the replacement of lawns with native plant gardens will reduce water need in these areas by 75-95%. This is because native plants in our region typically have much deeper root structures than grasses that make up lawns, allowing natives to gather water stored at deeper sources and store the water for longer periods of time. Gardens will also replace heat attracting bare soil to eventually reduce the so-called urban heat island effect, subsequently reducing locally raise temperatures by as much as 8°. This can ultimately lead to a reduction in peak electricity load across campus (e.g. air conditioning) by almost 5%.

In the southwest United States, climate change is exacerbating heat and drought conditions in an already arid climate. As these changes continue to progress, the choices that we make in our urban landscaping can make a difference for insect and other pollinators as they adapt to climate change. Our urban landscapes are maintained and irrigated, allowing them to provide reliable floral and foliar resources that may be lacking in natural areas during times of extreme heat and drought – a refuge. Installing several pollinator gardens throughout the UArizona Campus will allow these animals to persist and move through a relatively large area.

Social Sustainability Outcomes *

Please provide a brief description of how you expect your project to advance social sustainability on campus. Responses are limited to 3,000 characters including spaces. A definition of social sustainability is provided in our Spring 2022 Information.

Previous garden installations have required the involvement of approximately 12-20 students each. We expect at least that many students to be involved in the design and installation of each of the 25 gardens. Although garden installation will be open to all students, we expect that most of the students involved with direct garden organization and planting will be members of the Ecological Restoration club (both undergraduates and graduates) as well as members of Compost Cats and HydroCats.

At each garden, we will create and install a permanent sign that briefly explains the garden function and, with a QR code, directs the viewer to an information page about sustainability. The signage will function a permanent outreach tool to anyone walking by the gardens. We expect the permanent signage to significantly increase knowledge and awareness of sustainability to a huge number of UArizona students, faculty and staff.

Students involved in the new CURE course will be directly involved each year in assessing sustainability of gardens by measuring (for example) water savings, soil erosion, biodiversity, and energy offsets created by the gardens. Local indigenous ethnobotanists will be invited to provide information about native plant uses through guest lectures. Finally, we will work with relevant student groups such as Compost Cats and HydroCats to develop outreach activities that can be associated with the gardens. PI Gornish has extensive experience creating and deploying effective outreach activities for a variety of on and off campus stakeholders.

Student Leadership & Involvement *

Please provide a brief description of how you expect your project to benefit students on campus regarding the creation of leadership opportunities or student engagement. What leadership opportunities exist within your proposal? If you plan to hire/ or involve students, please describe in what capacity. For example, if you plan to hire students, create an internship, or seek student involvement, please describe relevant details thoroughly (wages, responsibilities, duration of job, extent of involvement, how you will solicit/ market these opportunities etc.). Responses are limited to 3,000 characters including spaces.

Garden installations in the past have been directed by members of the Ecological Restoration club on campus. Members who are interested in taking on a leadership role regarding garden development and installation are invited to join the garden subcommittee. Leadership within the subcommittee is decided by a vote. The committee is responsible for capturing club member interests (e.g. pollinator garden vs. food garden), communicating with experts, sourcing materials and planning the installations. This dynamic will continue with the proposed project.

In addition to club members being provided an opportunity to take on a leadership role on the garden committee, other student collaborators, such as members of Compost Cats and HydroCats, will be provided leadership opportunities to be involved in garden design. All interested students will be invited to join meetings with project PIs and the restoration practitioner to provide input, discuss ideas and learn about critical components for garden design and installation.

Although all students will be welcome to join in on garden installation days (numbers will be capped to 25 students per installation event for organizational purposes), we expect that students who help in garden installation will largely be pulled from the restoration club, Compost Cats and HydroCats.

Students will also be invited to create art for signage as well as develop ideas for outreach. A committee will be created for these efforts, and this committee will work closely with PI Gornish and the restoration practitioner to develop novel and fun outreach to connect the gardens to the UArizona community at large.

Education, Outreach, & Behavior Change *

Please provide a brief description of how you expect your project will communicate its impacts to the campus community. How will your project educate the campus community and/or incorporate outreach and behavior change? How are you reaching beyond the "sustainability choir?". Responses are limited to 3,000 characters including spaces.

Permanent signage at all gardens will provide educational opportunities for all passerby's. Signage will be created in a similar style to the UArizona Arboretum signage found around campus. Signs will be 4" x 6" and will briefly describe the garden and its energy offset. A QR code on the sign will divert viewers to a campus page describing sustainability on campus and actions that can be taken to enhance sustainability. These signs will ensure that all UArizona community members, not just the sustainability choir, will have access to education and outreach opportunities. Signage will also include information in the Spanish language, and all outreach components (e.g. handouts, website, etc) will also be accompanied by full Spanish translation.

Members of the Ecological Restoration club, Compost Cats and HydroCats will be encouraged to write blog posts about the gardens and submit these to on campus publications such as Lo Que Pasa to enhance communication of the gardens to the larger UArizona community. Photos taken of the gardens will also be posted on twitter and Instagram and will tag the UArizona Office of Sustainability and the University in general when appropriate.

Finally, outreach activities open to the UArizona community, such as compost making and seedball making will be organized at least once a semester during the three year cycle of the grant. Events will occur at or near at least one of the gardens. These events will not only provide novel educational transfer opportunities for the UArizona community, but hosting these events at the gardens will provide additional opportunity for attendees to learn about the gardens and how they relate to sustainability.


We expect that the number of new gardens will result in an enormous knowledge transfer with the UArizona community. This should indirectly lead to behavioral changes. Once community members learn how much money they can save by reducing irrigation to native gardens, they should be more likely to demonstrate behavioral changes.

Project Budget *

Please provide a completed project budget using our Budget Template. The template can be found here:

<https://arizona.box.com/s/23d2mtihkkrx95c42luhk4k5omtgrwt>

Using the link, click "Download" at the top right corner and it will download as an Excel Sheet. You will need to sign into Box if you haven't used it prior. Please save your Excel sheet as: Project Name_Budget Template

 Native plant gard...

Supporting Document

Not required, but please upload any relevant documents here, including annual reports, FM budget quotes, maps, images of the product or equipment to be purchased, etc.

