

Indigenous agave garden installation and outreach

Grant Type

Mini Grant

Application Type

Preliminary Application

Project Manager 1 Name

Elise Gornish

Project Manager 1 Status

Faculty

Project Manager 1 Email

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Project Manager 1 Department

AIR

Project Manager 2 Name

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Project Manager 2 Status

Faculty

Project Manager 2 Department

School of Natural Resources and the Environment

Project Manager 2 Role

Co-lead

Project Advisor Name**Project Advisor Email**

Project Advisor Department

Fiscal Officer:

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Fiscal Officer Department Name

AIR

Requested Funding Amount

Only enter this number after completing the budget sheet (the budget template will round up your request).

Mini Grants may request \$250 up to \$5,000.

Annual Grants may request \$5,001 up to \$100,000, and up to three years of funding.

Year 1:

\$5000

Year 2:

Year 3:

Project Name

Indigenous agave garden installation and outreach

Primary Project Category

Natural Environment

Secondary Project Category

Water

Background and Context

Please provide relevant background about your organization/team including your mission and/or expertise. Lay out the rationale for the proposed project, focusing on the issue that your project would address. You may also share how the project is new or how it complements, builds upon, or scales existing initiatives. This section is meant to give us more information about you and the context for the project, while the questions below provide space to go into detail about your proposal's plan and specifics.

Response:

The dark volcanic rocks that make up the Tumamoc hill or Cemamagi Du'ag (O'odham, Horned Lizard Mountain), rise 700 ft above the Santa Cruz River, providing unsurpassed views of the city of Tucson

as well as the surrounding mountains. These views, and the intact Sonoran Desert vegetation that surrounds the hill are a dominant reason that almost 1000 people walk the hill daily! However, the hill is much more than just a modern walking path: it is a testament to those who lived, farmed and worked there in the past as well as the community of today.

The Tucson basin has been continually supporting human settlements for at least 4 thousand years and Tumamoc highlights this history in every corner. From artistic renderings of Hohokam petroglyphs to spectacular examples of trinchera features, trail systems, mortar arrays, agricultural remains, and cooking pits, Indigenous history is one and the same with the landscape. Today, Tumamoc still serves as an important cultural site for Hohokam descendants such as the O'odham peoples.

A critical component of the hill is its history as a site of agave agriculture. Remains of both crop sites (rockpile fields) as well as charred plants suggest that Hohokam agave production took place on the hill and in the surrounding Tucson Basin from as far back as 1000 A.D (Fish et al. 1985). Although indigenous agriculture has been a part of Tumamoc Hill's history, there is no current cultivation of agave plants on the hill. We propose to engage Indigenous students in the design, deployment and maintenance of a small agave garden at the base of Tumamoc hill. The return of Indigenous farming of agave plants on Tumamoc has a huge number of benefits, including the demonstration of water saving agriculture to the community, the engagement of Indigenous youth in an ancestral activity, the connection of Tumamoc hill and Indigenous students to local organizations engaged in similar activities and the training of Indigenous students in career building gardening skills.

This project builds upon an existing Office of Sustainability project awarded to PI Gornish. The previous project deployed a series of pollinator gardens across campus and hosted associated outreach with the gardens. This work clarified design aspects of gardening work on campus and assisted in identifying effective ways of associating outreach with the gardens: knowledge that will be helpful in successfully completing the current proposed project.

Project Description

Please provide a thorough description and explanation of your project. Be explicit in what your team is proposing. What will your project's outcomes be and how will you achieve them? Outcomes should be specific, measurable, achievable, realistic, and timely.

Response:

We propose to support Indigenous students in claiming ownership of a garden that supports traditional Indigenous agriculture, specifically the cultivation of native agave species. Students will be recruited through the Indigenous Resilience Center. Local organizations (e.g. Mission Garden and the Desert Seed Resource Center) and anthropologists knowledgeable about the historic agriculture of Tumamoc will assist students in designing and installing an agave crop garden at the base of Tumamoc Hill. The site at the base of the hill is already set up to host a garden. There are existing basins, walking paths and irrigation.

Students will learn about dryland agriculture generally and agave agriculture on the hill specifically in a half day workshop. The students will then have an opportunity to work with non-profit collaborators who have extensive experience in deploying dryland agriculture to design the agave field. Agaves of different sizes and types will be purchased from Borderlands Restoration Network

and installed in the garden. An informational sign will be created by the students for installation near the garden. Students will take a survey at the end of the project to assess new knowledge of Indigenous agriculture developed through this project.

PIs Gornish and Johnson commit to assessing survival of the agaves past the life of the grant. Students will be encouraged to remain part of the agave project after the end of the grant period. Outreach events that are deployed in collaboration with the Indigenous Resilience Center and Tumamoc Hill will occur at the site long after the conclusion of the grant. The number of attendees at these events will highlight outreach magnitude. Student engagement after the life of the grant will suggest connection of students to the garden. Future grant writing efforts will be directed at expanding the garden.

Timeline

Please provide a timeline breakdown for the key steps in your project. The timeline can be basic, but please include anticipated timeframes for each major step, including any key dates for when certain elements must start or be completed. The timeline can be in list format.

Response:

Late March – Recruit 5 students; visit site
Early April – workshop; initial garden design
Late April – confirm garden design; purchase plants
Early May – garden installation; sign creation
Late May – sign production and installment

Budget Narrative

Use this section to provide supplemental justification for the items you are requesting on your budget sheet. Please break down your justifications into the budget categories: Personnel or operating budget. Do not list out each expense or repeat notes made in the budget template, but instead address why the line items are being requested and the purpose they will serve, providing elaboration when necessary.

If you are requesting funding for personnel, use this section to elaborate on the position you are creating and how the budget and timeline was established for it. If you plan to hire students, describe in what capacity. Describe relevant details thoroughly (wages, responsibilities, duration of job, extent of involvement, how you will solicit/ market these opportunities etc.).

Ensure the descriptions match the line items in the budget sheet.

If matching or supporting funds are secured for the project, identify the source and amount in this section, and detail the impact of the matching funds on your overall budget.

Response:

To reduce barriers to participation, we request typical hourly rates to cover the time of students

associated with the project. The students will learn about dryland agriculture and then will design and install an agave garden. Finally, they will design informational signage and propose outreach activities. Additional funding is requested for the agaves themselves, sign printing (installation will occur for free by Tumamoc Hill staff), items for the workshop and covering time of collaborators to assist in garden design and deployment. Travel is also requested.

Project Feasibility and Logistics

The Campus Sustainability Fund will only fund projects that have completed the necessary work to ensure they can succeed, be completed in the grant's timeline, or have an accurate budget.

Please provide a description of the work that has been completed so far to make this project feasible. Please provide a description of the work that has been completed so far to make this project feasible. If relevant partners have been contacted/coordinated with, please identify them in your response.

For example, have you received consent or authorization to complete your project (such as from Housing and Residence Life, Facilities Management, Parking and Transportation, etc.)? If you are making modifications to campus, do you have written authorization or official quotes from Facilities Management to accurately identify the cost of labor and supplies?

Response:

A space for a garden at the Base of Tumamoc Hill was created in 2020, including basins and swales to capture water, invasive plant removal, walk way installation and irrigation installation. The Director of Tumamoc Hill (PI Gornish) has already provided approval for the installation of native agaves, which has been supported by the Desert Laboratory Advisory Board (PI Johnson is a member of this board).

Mission garden, the Desert Seed Resource Center and Paul and Suzy Fish (Archeologists) have all already agreed to take part in this project. Borderlands Restoration Network has also agreed to take part in the project and they have availability of native agaves for purchase. The project can be deployed immediately and the PIs are confident that the project can be completed and all funds spent prior to the June 30th fiscal schedule.

Environmental Sustainability Outcomes

Please provide a description of how you expect your project to advance environmental sustainability on campus. A definition of environmental sustainability is provided on our Guides and Tips page.

Response:

Indigenous dryland agriculture in the southwest relies on the development of plantings that can self sustain in the absence of irrigation. This type of agriculture and gardening must become a more common part of gardening in the southwest as drought continues to be a regular part of the landscape. This garden will enhance sustainability of the campus in several ways. First, students will receive training on the development, deployment and maintenance of a dryland agriculture site,

increasing knowledge of how to sustainably enhance native plant coverage on campus and beyond. Second, signage associated with the garden will increase knowledge about sustainable plantings to the general public, who will associate this information with the University. Finally, outreach activities will be regularly deployed at the garden site. Outreach activities will be hosted by Tumamoc staff, Cooperative Extension, the campus ecological restoration club, the Indigenous Resilience Center and other groups from campus, providing training, experience and knowledge transfer from groups on campus to the general public.

Moreover, the presence of the plants will enhance environmental sustainability. Currently, the garden area at the bottom of Tumamoc hill is a largely unvegetated landscape covered by a few trees. These unvegetated soils erode rapidly, reduce wildlife habitat quality, do not hold soil moisture well and heat up much faster than sites covered by plants. Installing native agaves in unvegetated areas will reduce erosion, enhance soil water holding capacity, provide resources for a large suite of wildlife and reduce heat in a visually stimulating way.

Irrigation is available at the garden and will be used only for the first month of planting to ensure success of agave seedlings.

Social Sustainability Outcomes

Please provide a description of how you expect your project to advance environmental sustainability on campus. A definition of social sustainability is provided on our Guides and Tips page.

Response:

Indigenous students are engaged at every step of the process of this project, strongly linking their own perceptions, skills, interests and culture into the project. Outreach events will focus on centering Indigenous voices and Knowledges for information transfer to the wider public. Our goal is that this project is just the first in a series of gardens at Tumamoc the feature culturally critical plants.

Signage associated with the garden will be in at least three languages: English, Spanish and O'Odham to increase knowledge transfer to a broader range of individuals and to highlight our interest in connecting with a broader variety of communities than simply those who read in the English language.

Student Leadership & Involvement

Please provide a description of how your project will benefit students on campus regarding the creation of leadership opportunities or student engagement. What leadership opportunities exist within your proposal? If you plan to seek student involvement, include relevant details thoroughly and how you will solicit/ market these opportunities.

Response:

Students will be recruited for this project in collaboration with the Indigenous Resilience Center,

which has ample experience connecting with Indigenous students.

The students who will take part in this project will lead the project. They will be guided by organizations that are familiar with details associated with planting native gardens but it is the students who will be the main decision makers of this project for both the planting, the signage and initial outreach events. The students will also be galvanized to identify, apply for and lead subsequent projects associated with the agave garden. We will encourage the students to assist in publicizing the garden through blog posts, social media posts and talks – activities that will assist them in developing communication skills. Students will also be supported in deploying their own outreach activities which Tumamoc Hill will publicize to its listserve of over 1400 individuals.

Education, Outreach, and Behavior Change

What opportunities does this project provide for members of the campus/community to learn about sustainability? How will your project educate the campus community and/or incorporate outreach and behavior change, particularly those who are not currently engaged with sustainability or environmental work? Please provide a description of how you expect your project will communicate its impacts to the campus community.

Response:

The garden will provide ample opportunity for both members of campus as well as the community to learn about sustainability. The garden will demonstrate (and explain through signage and outreach activities) how dryland agriculture in the desert is possible through strategic planting and rock placement. This information can modify how individuals think about the relationship between plants and water in the Sonoran Desert, expanding their perception about what they are capable of doing with their own native gardens. Over 1000 community members walk Tumamoc Hill EVERY DAY! These individuals will be directed to the garden after its creation (through signage, posted placards and emails) so that they can learn about low water gardening. Students from campus will be invited to learn about the garden through class and club visits, outreach events and blog postings from their peers. It is the plan of the PIs to continue support and development of the garden through a VIP or a CURE course.

To create action change, we will be more hands on. Outreach activities at the garden will be scheduled into the regularly scheduled outreach calendar of Tumamoc Hill. PIs, their labs, Tumamoc Hill staff and collaborating individuals will design and deploy hands on outreach activities by the garden to transfer knowledge and create behavior change associated with low water use in gardening. Outreach events can include showcases of Indigenous gardening practices; choosing low water plants; catchment and swale creation; and agave harvesting. Hands on activities have been shown to lead to greater and more sustained behavioral changes across audience types.

The garden itself plus outreach events will be communicated to the campus community in a variety of ways. First, Tumamoc Hill tabling will occur on campus at important events (Tucson Festival of Books, earth day, etc) and at the table, the garden and outreach activities will be highlighted. Students associated with the project will also be encouraged to write blog posts about the garden which will be posted to popular University listserves and pages. We will engage with the Indigenous Resilience Center to enhance publicity of our project outcomes as well.

Committee Feedback

Please detail where you would specifically like feedback or application support from the Committee members. While they will give general feedback in all project criteria areas (Feasibility & Logistics, Environmental Sustainability Impact, Social Sustainability Impact, Student Leadership & Involvement, and Education, Outreach, & Behavior Change), you may note here where additional feedback could be most useful to you.

Response:

Where did you hear about this funding opportunity?

Email from the CSF