Expanding a Data and Mapping System to Accelerate UA Sustainability Engagement and Impact

Phase 2

January 26, 2017

1. Proposal Overview
   A. Abstract:

This proposal expands products of Phase 1 of this project, funded by the Information Technology Student Advisory Board (ITSAB) during FY16. The implementation of Phase 2 of the project will utilize the Green Fund funding requested in this proposal. The completed Phase 1 product is located here: https://sustainabilitymap.arizona.edu/

Phase 2 of the Sustainability GeoDatabase (SGDB) and Sustainability Web Map project is focused on providing enhancements that will assist in accomplishing new objectives. These improvements will increase the quantity and quality of content available in the application.

These goals include:

- Integration of data regarding people, events, and resources related to UA sustainability
- Accelerating impacts of sustainability efforts
- Providing tools that expand student engagement
- Empowering campus sustainability analytics
- Increasing accessibility of sustainability information

The project will achieve our goals by building upon the Sustainability Web Map created in Phase 1, an application designed primarily for mobile devices. The Phase 2 product will reach a larger audience by creating a mode of the application optimized for tablets and desktop computers.

Additional functionality that will be created during Phase 2 includes:

- A spatial view of individuals affiliated with sustainability projects and programs
- The ability to observe live data feeds regarding resource usage and other metrics on campus
- An event-finder that will encourage attendance and participation in sustainability events
- Other usability enhancements to the application

Students, Staff, Faculty, and the Tucson Community will gain a powerful visual resource, and a means to access an evolving sustainability database containing activities completed or in progress across campus. It will provide a source of information to use in shaping future Green Fund proposals. These benefits will bolster organizational synergy and stimulate further development of successful Green initiatives that will continue to cement the University of Arizona as a leader in sustainability across Arizona, the country, and the world.
B. Project Narrative:

With the prevalence of smartphones and computers in modern society, advanced web applications are becoming more and more a part of our day-to-day life. Every year, thousands of new students enter campus and search maps to find their classes and local points of interest. The Sustainability Web Map created during Phase 1 of this project (see Figure 1 below) contains basic information, such as the names of buildings, which is helpful for new visitors to campus. In addition to helping with navigation, this sustainability application also contains and highlights sustainability projects and programs occurring on and near the University, which will increase exposure and participation in sustainability activities. The Sustainability Web Map is consistent with existing UA Sustainability sites in terms of content, but provides information through a spatial representation unavailable elsewhere. This key characteristic will be greatly amplified through Phase 2.

Phase 2 improvements will specifically address the following functionality improvements:

- **Locations and activities of individuals** who are key contributors to UA sustainability will be depicted visually, creating a tool for immediately measuring the impact of contributions in a field by a specific person.
- **Constantly updating feeds of information displayed in dashboards** of specific resource consumption by location across campus. This data will be useful for generating assessments of sustainability by organizations including departments and colleges within the University.
- A mode that displays all **ongoing and upcoming events** on or around campus that are related to sustainability. Providing another outlet for promoting events will serve to increase attendance and community participation in activities that may have otherwise gone unnoticed.
- **News articles** that are refreshed daily by the application will appear in a window for convenient access. This functionality aggregates many existing sources of sustainability information and provides it all in a single location for users.
- **Increasing the power of the search function** within the existing application. Improvements to provide the user with a more intuitive and powerful search engine to ensure that the user can find anything and everything they are looking for.

This project began in November 2015 with funding from ITSAB to create the Phase 1 product – a mobile application containing a University of Arizona sustainability map, powered by a database.
housed in the **UA Enterprise Geographic Information System (EGIS)**. The project team has designed and constructed the database to incorporate additional sustainability data, such as the information regarding individual involvement, campus resource usage, and event dates and locations.

This proposal expands the existing application and database into an even more powerful application that will make it one of the best sustainability web maps by a university in the country. By providing the community with a comprehensive database that individuals can access intuitively via a map application, locating and engaging with sustainability efforts will become much easier.

**Some short-term benefits of the proposed Phase 2 project are:**

- Immediate student employment to facilitate improvements to the existing application
- Publicity for stakeholders (including the Green Fund) via news articles and marketing releases affiliated with the launch of the Phase 2 application.
- Access to resource usage dashboards will allow for instant awareness of consumption practices that may be modified to save the University money, and decrease emissions or waste.
- Increased ability to provide feedback to appropriate parties about Sustainability activities on campus.

While Phase 2 is underway, student volunteers will engage the community by locating additional data to incorporate within the map or collecting feedback for use in refining the performance and quality of the application. UA Sustainability stakeholders will gain a platform to display activities that they are involved with that will be publicly visible, a source of information for individuals interested in learning more about ongoing or previous projects. The Phase 2 product will contain functionality that allows the sharing of events on social media, so interested parties can spread the word that they will be participating in a specific activity. Stakeholders will be able to link directly to specific activities they would like to promote, which will lead to higher attendance and greater visibility of UA sustainability efforts.

**A few of the long-term benefits of the proposed Phase 2 project are:**

- University obtains a more powerful database of sustainability information for uses such as analyzing and observing trends in research
- The Green Fund could identify areas that are being relatively underfunded  
  - For example, Green Fund Committee members could hypothetically use the database to observe that ten Food/Agriculture projects had been completed in the last year, but only one Energy project was funded.
  - This could inform decisions with the intent of diversifying the proposals funded to ensure that the University was supporting a wide breadth of activities.

*These short and longer term benefits are expanded on in Section 2.A below.*
C. Project Members

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  - Student Volunteers TBD

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D. Benefit to Students

1. Administrative co-leader
   - A student employee will be hired to work for the duration of the project, overseeing/advising on content decisions, functionality priorities, general problem solving, and assisting in day to day operations ensuring the application and database remain up to date and functioning properly.
   - This student employee will oversee student volunteers and ensuring proper organization of the team.

2. Student Volunteers
   - The project team will seek out student volunteers from UA Sustainability organizations and clubs like Students for Sustainability to help lead discussions about the application and database. These students may also be included in the data acquisition processes to help expedite the growth of the database.

3. Experiential Learners
   - The potential for experiential learners is virtually limitless; the web map application will be available to the public via the internet, and the relevant data collected and stored in the EGIS system will be accessible / searchable (see Figure 2) to anyone who is interested. This includes the Student population of over 40,000 individuals, plus faculty, staff, or citizen scientists who are interested in getting involved in sustainability with the University.

![Figure 2: Basic search functionality within current UA Sustainability Web Map (Phase 1) Will be Significantly Enhanced in Phase 2](image)

E. Project Timeline

- November 2015 – January 2017: Phase 1 Completed
- August 2017: Hire Administrative co-leader; CALS-CCT begins Phase 2 improvements
- Oct. – Nov. 2017: Database enhancements and development; CALS-CCT continues to support/develop application
- Dec. 2017 – June 2018: Data development/application improvements
- January – June 2018: Marketing, Promotion, and Training events
- June 2018: Phase 2 Completed
F. Marketing

The application will include acknowledgements and credits of the funding sources, including the Green Fund logo and a link to the Green Fund website. Green Fund team members will be engaged in defining and carrying out marketing efforts. The map will display all projects supported by the Green Fund as a distinct and identifiable layer, meaning that users can view all Green Fund projects at once in a view that displays how prolific the Green Fund has become. Users will be able to view places like the Community Garden, Compost Cats partner locations, or learn more about programs like Zero Waste athletic events and the aquaponics education being done with local schools.

Additionally, all marketing and promotional materials (including discussions and presentations given regarding or including the application) will include the Green Fund logo and references to the support provided.

Marketing of the application itself will be widespread via social media and existing University websites. The SWES Department homepage will feature a story about the application after the launch; the Institute of the Environment will promote any news story from University Relations and UA News in addition to including information in their weekly e-newsletter that discusses the map application. Social media pages (Facebook, Twitter, etc.) will promote the map as well by providing links to news articles discussing the application and by sending out links to the web application.

In order to address specifically the issue of marketing to individuals outside of groups already interested in sustainability, the project team will discuss the options for creating and displaying a news article on the UA homepage after the Phase 1 and 2 launches.

The primary product of this project, the Phase 2 Sustainability Web Map application, will increase the ability of the Phase 1 product to be an excellent marketing tool for the accomplishments of the Green Fund and all other UA Sustainability organizations.

2. Metrics

A. Desired Impacts

*Short Term:*

We intend for the overall outcome of this project to be a dramatic increase in the exposure of sustainability accomplishments at the University of Arizona, and to accelerate engagement of the student population with campus sustainability. Other current UA web maps have a very high level of impact, use, and visibility. For example, the UA Public Map (http://map.arizona.edu) linked to from the main UA website (http://www.arizona.edu) had over 11,000 views on the first day of class, Fall semester 2016. The Arizona Mobile web application (https://m.arizona.edu/default/) is the mobile equivalent of the main UA website, and the map module (https://m.arizona.edu/default/map/), one of over 20 modules of information making up this application, is the most used with over 32,000 visits during the first two weeks of class (Spring 2015 semester).
Additional anticipated impacts include:

- **Increased success of sustainability initiatives:** more student participation, more initiatives completed because of greater visibility due to the new event-finder and improved database.
- **Due to the sustainability web map application being available on additional platforms (tablets, computers), participation in sustainability activities will increase.** The impacts of community and partner organizations will then be accelerated as a result, leading to an improvement in overall community sustainability.
- **The UA Sustainability Web Map will be a primary launching point for exploring UA sustainability information.** The dashboards and individual contribution data contained within this map will provide users with introductory information and the contact details necessary to follow-up on their inquiries with the correct individuals. The Map will provide a user-friendly method for submitting feedback on desires for enhancements to the Map/data.
- **By continuing to populate and develop the Sustainability GeoDatabase, it will become a key, if not the authoritative, source for UA sustainability data and information related to becoming involved in sustainability activities.** Figure 3 below indicates breadth of subject matter addressed.
- **Web map applications can leverage the database and dashboards in the future.**
  - For example, a UA solar energy program/club could create a web map customized to highlight campus solar projects. Most solar information presented could be the same as what the UA Sustainability Web Map shows, but packaged differently in the solar map, and perhaps allow drilling deeper into additional solar resources. By utilizing the Sustainability Spatial Database as the source of information for their solar map, users avoid duplication of effort, and information used will be correct and consistent.
- **Sharing events from the application to social media platforms such as Facebook and Twitter will allow students who are working in sustainability to connect directly with other students who are interested in combining their efforts.**

![Figure 3: Breadth of Subject Matter Addressed in Current Sustainability Web Map](image)
*Depth of Information in Each Category will Increase During Phase 2*

**Long term:**
We anticipate a **significant contribution to the 100% student engagement goals** included in the UA’s strategic plan due to increased participation in sustainability activities. The application will benefit
UA recruitment efforts as well by providing an impactful device that can display all of the accomplishments that the University has been a part of related to sustainability. Additional anticipated impacts include:

- **Beyond supporting current students,** the project’s results will support **recruitment of future students** (while still in K-12), as well as supporting graduates/alumni throughout their careers by making information and resources about UA sustainability easy to access. Potential students who are interested in attending a sustainability-focused university will be able to identify clearly that the University of Arizona is a national leader in the field by seeing a densely populated map of achievements.

- **An ongoing source of sustainability engagement opportunities** is created through **student internships** involving the support of the Sustainability Map and Database. The potential for continued expansion of these products is virtually limitless – generations of students could be employed and tasked with maintaining and improving the resources that will be created via this project.

- **Increased leadership capacity** for sustainability organizations within, and collaborating with, the UA (e.g. improved Green Fund proposals over time as students have more informational context to develop their proposals based on better understanding of existing and past projects).

- **Increased sustainability innovation and entrepreneurship** in Tucson and Arizona will be promoted by displaying the successful innovations of the past on the map application.

- **UA’s commitment to sustainability and leading is more widely recognized** at all scales, definitively shown by compiling and displaying the immense quantity of activities being worked on through the University.

### B. Measurement and Reporting Plan

Results of this project will be “living resources” rather than one-time products with a finite impact, and as such, project impacts as well as measurement and reporting will be ongoing. Below is a description of the plans for project result management over time, along with a proposed impact report that will serve as a benchmark for future measurements.

- Once completed, the **Office of Sustainability will be the lead steward of the UA Sustainability Spatial Database and Web Map.** This includes a primary role in oversight of major decisions about management, updating, development, and reporting of these resources over time.

- The Office of Sustainability desires to use this as a **tool for data gathering and analytics** in support of external sustainability reporting that supports UA rankings and ratings in sustainability performance.

- Other project partners and stakeholders will be part of an **ongoing board** that will decide on changes. Partners will have the opportunity to maintain data where applicable or desired.

- While some of the technical management tasks of the ongoing maintenance of the system will reside with the Office of Sustainability, the **UA Enterprise GIS technical infrastructure will host** the database itself and software application.

- Project members will conduct **training sessions to promote the project** and help users understand what they can do with it. We will keep records of attendance at training events, and feedback evaluations conducted to understand how to improve training and tools.

- **EGIS will use Google Analytics to track actual usage** of the web map.
Six months following the completion of the project, we will submit a report to the Green Fund Committee that summarizes the data from Google Analytics and other evaluations related to the application usage. This report will flow from the Measurement and Reporting Plan described within this proposal, including measurements such as those listed below. Note that the last four bullets are potential measures that will either come over a longer time horizon, and/or will only be obtainable through future high-level assessment efforts that include methods to isolate impacts of the Sustainability Web Map and Database:

- Numbers of users of the Sustainability Web Map, obtained through Google Analytics
- Numbers of web referrals to the map from other websites, from Google Analytics and social media
- Increase / decrease in people, events, and news feeds from initial baseline of these items included
- Numbers of reports, maps, etc. supported by the SGDB
- Number of future web maps taking advantage of the SGDB and EGIS platform
- Numbers of Sustainability Web Map and Database referrals within green fund applications; quality of proposals
- Feedback obtained at training workshops and through other means
- Efforts by the Green Fund to comprehensively identify impacts of supported projects
- High level efforts to measure progress on sustainability efforts in instruction and research
- Comprehensive surveys, etc. of community and other partnerships, impacts on programs and leadership, etc.
- Assessments of UA student recruitment efforts, alumni outreach, and fundraising efforts

3. Budget

Labor/Education/Preparation/Marketing:

$ 22,200 – Please see submitted spreadsheet for additional details.