

UCLA



Sage Hill

Outdoor Laboratory for Teaching and
Undergraduate Research

Sage Hill: An Outdoor Laboratory for Teaching and Undergraduate Research at UCLA

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Background

What is Sage Hill?

The opportunities to engage students across many disciplines in an outdoor, natural setting are limitless. Sage Hill, a 3.5 acre plot of land located in the northwest corner of the UCLA campus, offers unique outdoor research and learning experiences for undergraduate students. The site represents the last remaining patch of native California habitat in West Los Angeles south of Sunset Boulevard and supports an impressive level of biodiversity. For many years, UCLA faculty have been informally using the site for teaching activities. With support and proper management, Sage Hill could provide hands-on, meaningful educational activities for a wide range of fields including environmental science, ecology, geography, engineering, American Indian studies, arts, humanities, and more. Sage Hill also represents a unique, accessible platform for independent research for undergraduate students at UCLA.

Undergraduate Learning and Research

An emerging body of evidence points to the benefits of undergraduate research experience and hands-on learning. There are numerous positive outcomes for undergraduate students participating in research including improved performance in classes, higher self-identification as scientists, and better retention of students from under-represented groups.[1,2] Studies suggest that exposing undergraduate students to the field of scientific research, in addition to their foundational classes, can also help inform their career trajectories and foster professional development.[3] Developing and supporting undergraduate research programs benefits students, faculty mentors, and universities. Students gain valuable skills that have a lasting influence throughout their academic and professional lives.[4] The university in turn benefits from research publications that provide increased visibility in scientific and other scholarly communities.

Opportunity

Actively facilitating access to field courses can also lead to publications and presentation opportunities for under-represented demographic groups. A recent study at UC Santa Cruz has shown that under-represented students who participate in field courses have higher college graduation rates, GPAs, and major retention[5]. Such courses provide opportunities for deep immersion in the subject matter, active learning, small class sizes that



facilitate participation, and meaningful student-faculty interactions. Supporting outdoor-based courses offers a low-cost option for universities to engage students in their early career and promote a promising pathway for diversifying the STEM workforce. [5] Despite being a top-ranked public university, UCLA does not make it into the top rankings for undergraduate research and creative projects, placing it below UC Berkeley and UC Davis. [6] Although UCLA offers undergraduate students the opportunity to participate in research projects with faculty mentors through specialized courses and departmental honors programs, there is a lack of opportunity for students to pursue field research and outdoor learning on campus. Offering field research opportunities on campus eliminates significant logistical and transportation needs associated with off campus field sites. In addition, creating an outdoor 'laboratory' is much more cost-effective than remodeling a conventional UCLA laboratory building.

Goals

By formally recognizing Sage Hill as a valuable campus asset and supporting its development, UCLA is opening education and research opportunities for undergraduate students across multiple disciplines. Using data gathered from student and faculty surveys, this report examines the demand for Sage Hill as a host for courses and undergraduate interdisciplinary research. Additionally, three levels of support scenarios are provided including basic staffing and equipment needs, a list of needed improvements for the site, and a plan for a research program.

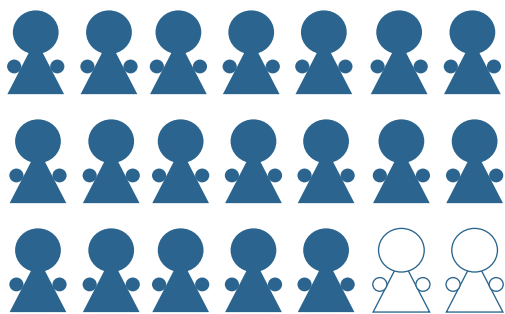
Faculty Survey



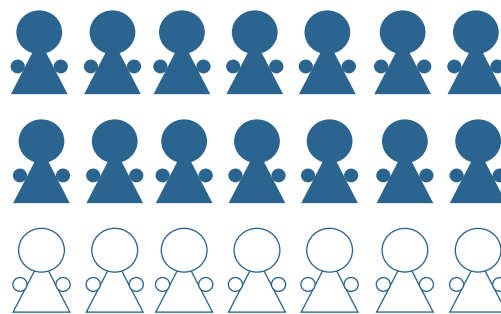
21 Faculty Representing 14 Departments

- American Indian Studies
- Anthropology
- Atmospheric and Oceanic Sciences
- Civil & Environmental Engineering
- Earth and Planetary Space Sciences
- Ecology and Evolutionary Biology
- English
- Environment and Sustainability
- Geography
- Gender Studies
- Psychology
- Sociology
- Theater Film and Television

19 of 21 faculty interested in teaching undergraduate courses at Sage Hill



14 of 21 faculty interested in mentoring undergraduate research at Sage Hill



Top Resources Requested

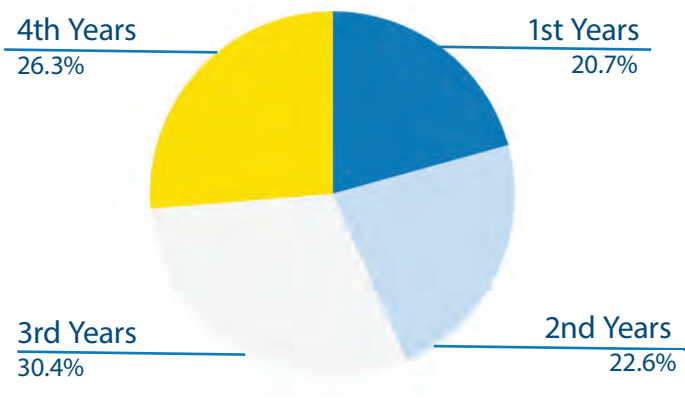
- Seating area
- Proper access and more formal route of entry
- Field equipment: measurement instruments, binoculars, and notebooks

Student Survey

217 undergraduates

representing 35 majors
and 26 minors ...

Grade Levels



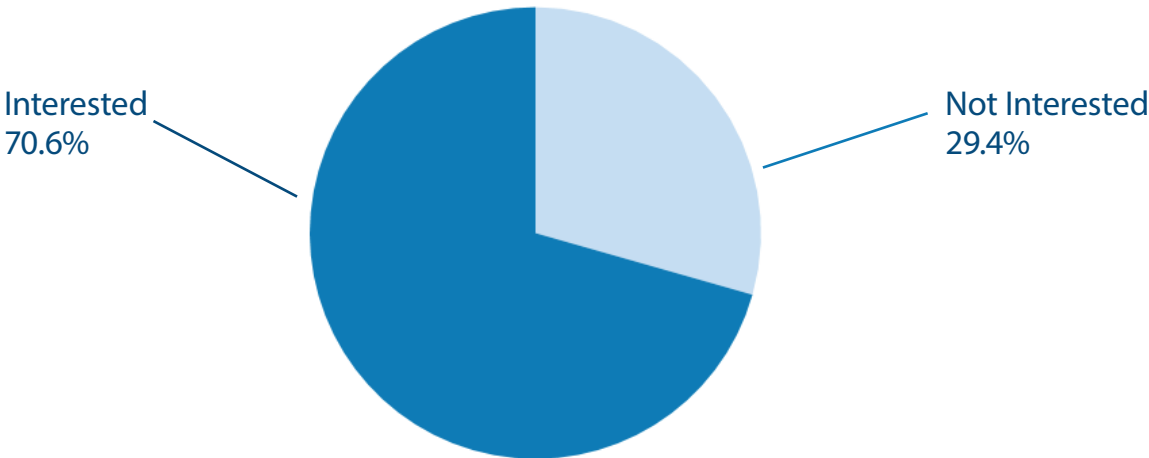
Research



Top Impediments to Conducting Research

Time Constraints	57.4%
Lack of Transportation to Field Sites	46.3%
Lack of Faculty Mentors	36.3%
Personal Financial Situation	28.1%

Undergraduate interest in
conducting outdoor research



Student Survey



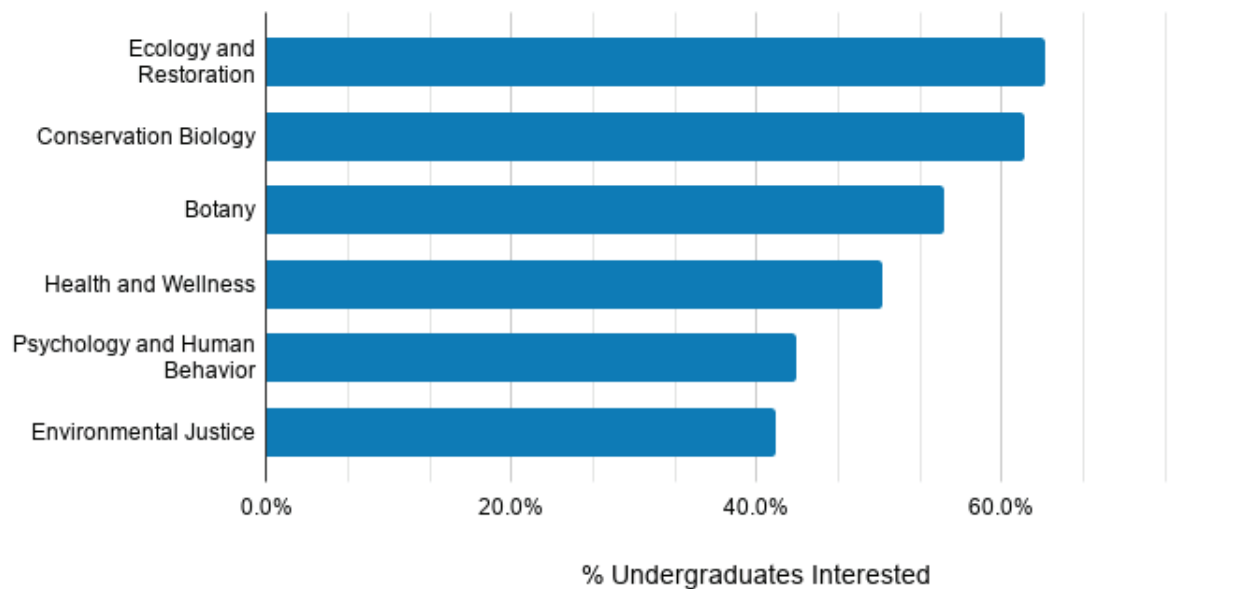
Courses



70.5% of undergraduates interested in taking courses at Sage Hill



Topics of Interest



Activities Students Currently Engage In at Sage Hill

- Enjoying nature
- Class activities
- Socializing with friends
- Student group activity
- Spending time alone



Vision

In the next 5 years, we hope Sage Hill will become a paramount part of UCLA's campus with the ability to teach countless students, generate innumerable scientific articles, and launch the careers of many well-respected scholars by providing them with the foundational knowledge to develop solutions for climate change, biodiversity conservation, and other pressing environmental and social issues.



In order to transform Sage Hill into a space that supports multiple uses for teaching and research, the area will be established into three zones: an urban nature teaching zone, restoration zone, and an outdoor laboratory zone

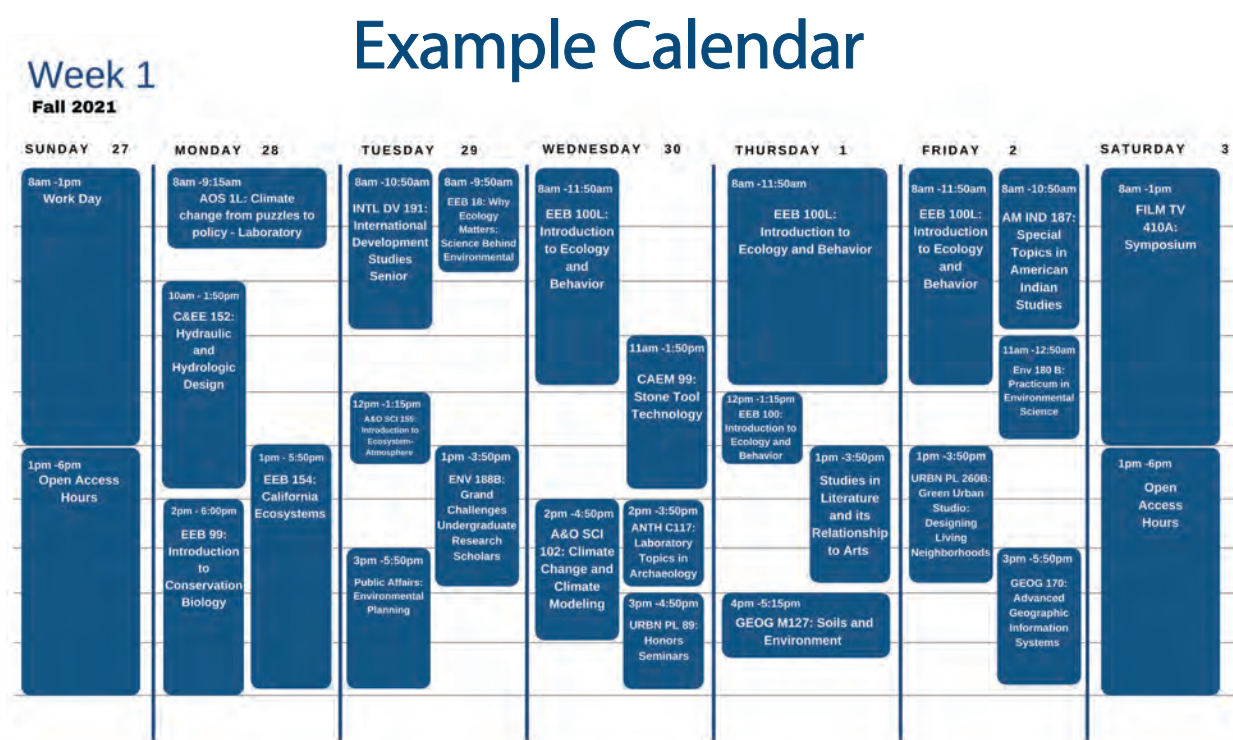
Vision

Students from a variety of disciplines will have the opportunity to engage in unique courses and research projects with faculty mentors across different departments including American Indian Studies, Anthropology, Atmospheric and Oceanic Sciences, Civil and Environmental Engineering, Ecology and Evolutionary Biology, English, Psychology and more. Students will also be able to connect with this remarkable piece of nature and learn about the historical presence and traditional ecological knowledge of the Tongva people -- the original land caretakers of this region. In addition, Sage Hill offers a space for students to enjoy nature and participate in mindfulness experiences that are difficult to find on or near campus. Sage Hill has become an important and impactful space for many UCLA students. As stated by a student who has been involved with the site in the past,

“Sage Hill has always been the place to quickly escape the insanely busy urban environment for the pristine and sublime nature that lies within. I have seen this small ecosystem develop and thrive into one supporting a plethora of ecologically diverse and beautiful species, and I cannot imagine my UCLA experience being as influential without Sage Hill.”



This quote highlights the significance of Sage Hill as a space to shape and influence student experiences at UCLA. By supporting and formally recognizing Sage Hill as an outdoor classroom and living laboratory on UCLA's campus, the university would open up the space to unique education, research, and recreation opportunities that will have a lasting impact on the lives of undergraduate students for years to come.



Scenarios

● ● ● Sage Hill has incredible potential to be transformed into a center of learning and research at UCLA but requires crucial clean up, improvements and staff before students can safely utilize the space. Historically, the site has been loosely maintained by a few dedicated faculty and student groups in collaboration with Facilities Management. To function as a site that effectively supports multiple courses and research projects, Sage Hill will need clean-up, improvements, supplies and equipment, and personnel to manage the space and to collaborate with faculty instructors and student researchers. Here we present three possible scenarios for transforming Sage Hill: Basic, Moderate, and Fully Supported.

Basic Plan

The Basic Plan includes the minimum level of clean up, site improvements, supplies, and personnel required to facilitate classes and undergraduate research at Sage Hill. This plan, which can be administered quickly and with a relatively modest budget, will transform the site from a neglected space to a monitored area that is clean and safe for students to explore. The following improvements and support will allow the site to host six courses per year (two per quarter) and three student research projects.

Improvements:

- Clean up trash
- Remove large debris
- Improve trail for safety
- Add waste bins
- Water source
- Improve access, including ADA access
- Webpage

Supplies and Equipment:

- Hand tools
- Plant nursery supplies
- Teaching supplies

Personnel:

- Faculty Director
- Graduate Student Researcher, 1 quarter



Moderate Plan

The Moderate Plan includes all the requirements of the Basic Plan to create a functioning Sage Hill, as well as more classroom structure, research support, online resources, and additional personnel. This moderate level of investment could support up to 20-30 courses per year and 10 student research projects.



Improvements:

- Low profile rustic benches in key spots
- Storage facility
- Additional signage for posting information, access, and rules of use
- Advanced website and social media presence

Supplies and Equipment:

- Binoculars
- Camera traps
- Sampling equipment
- Kits for plant, soil and water analysis
- Fencing around experimental plots

Personnel :

- Site Manager, full time
- Graduate Student Researcher, 4 quarters

Fully Supported System

The Fully Supported System plan has all the requirements of the Basic and Moderate Plans and includes a top of the line outdoor classroom. This plan expands beyond the physical site of Sage Hill to include marketing of the location and a well-funded undergraduate research program. The Fully Supported System allows faculty to create courses that are fully outdoors and opens the space to more types of teaching activities. The research program promotes and incentivizes students to conduct research. This plan could support up to 40 courses per year and 15 or more student research projects.

Improvements:

- Outdoor classroom
- Healing/meditation space
- Marketing Campaign


Personnel:

- Administrative Assistant, 25% time

Program Funds:

- Undergraduate Research Program
- Research grants for supplies and expenses (\$500-\$1000)
- Research Scholarships (\$4,500-\$6,000)





“Sage Hill, a site I worked on with Sustainability Action Research, holds a lot of sentimental value for me. I spent hours removing invasive mustard plants, which was therapeutic and allowed me to vent my frustrations. Though I didn’t realize it at the time, when I worked on Sage Hill, I was also working on myself.”

- First generation undergraduate student

“Sage Hill has enriched my life by providing a place for me to be outdoors in a native environment and by creating a space for me to convene with others who have similar interests. I feel as though this is an integral part of college life and Sage Hill is a great place for it to occur.”

- Second year undergraduate student

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- [6] U.S. News & World Report. Undergraduate Research/Creative Projects. Retrieved 2020, from <https://www.usnews.com/best-colleges/rankings/undergrad-research-programs>

Sage Hill Practicum Appendix

1. Appendix 1: **Demand for Sage Hill Courses and Undergraduate Research**
2. Appendix 2: **Details for Scenarios to Transform Sage Hill**
3. Appendix 3: **GIS Map**
4. Appendix 4: **Survey Questions**

Appendix 1: Demand for Sage Hill Courses and Undergraduate Research

Introduction

In order to gather information about prior use of Sage Hill, as well as the demand and preferences for future courses and research topics, surveys for both students and faculty were developed and distributed. In the surveys, we asked how many students and faculty were familiar with Sage Hill and whether or not they would be interested in courses and research at the site. We also wanted to learn more about the obstacles that students and faculty face that would prevent them from teaching or taking a class at Sage Hill, so questions pertaining to this were asked. In addition, key informant interviews were conducted to collect important information regarding the site. These were then used to manage our priorities and help us develop the surveys. The results of the student and faculty surveys were used to guide our list of recommendations and improvements including recommendations for designing a student research program and priority course development.

Methods

1. Key Informant Interviews

We first identified key informants, who are people with intimate knowledge of Sage Hill, to gain a better understanding of the background and context of our research, and to understand the perspectives of faculty and staff when developing our surveys. The following faculty members were interviewed: Dr. Thomas Gillespie from the Geography Department, Dr. Thomas Wake from the Cotsen Institute of Archaeology, Dr. Bob Bilder from the Psychiatry Department, Dr. Mishuana Goeman from the American Indian/Gender Studies Departments, and Dr. Travis Longcore from the Institute of Environment and Sustainability. We also interviewed Nurit Katz, who has long been involved with the development of Sage Hill and is UCLA's Chief Sustainability Officer and Executive Officer for Facilities Management. We also contacted students from the Environmental Student Network (ESN); Tim Arnold, Ryan Alvarado, Ronnie Thompson, and Kyle Alves. They provided feedback regarding their experiences leading restoration and outreach projects at Sage Hill. Interviewing individuals from a wide variety of backgrounds and departments allowed us to develop surveys that catered to the broad, multidisciplinary UCLA community.

2. Faculty Survey

Our team developed a faculty survey using Google Forms. The survey was developed by incorporating the feedback we received from the key informant interviews. The link to the survey was emailed to the following 16 UCLA Department Chairs to distribute among faculty members: Shannon Speed (American Indian Studies), Christopher Throop (Anthropology), Suzanne Paulson (Atmospheric and Oceanic Sciences), Ertugrul Taciroglu (Civil and Environmental Engineering), Karen Sears (Ecology and Evolutionary Biology), Ursula Heise (English), Shane Que Hee (Environmental Health Sciences), Edwin Schauble (Earth, Planetary, and Space Sciences); (Glen MacDonald) Geography; Cully Nordby (Institute of the Environment and Sustainability), Beth Lazazzera (Life Science Core) Bob Bilder (Psychiatry and Behavioral

Sciences), Annette Stanton (Psychology), Megan Sweeny (Sociology), Willian McDonald (Theater, Film and Television), and Vinit Mukhija (Urban Planning). In addition, the survey was directly sent to the staff and faculty who participated in the key informant interviews, as well as those who have been involved with Sage Hill in the past including Allison Carruth, Pat Turner, Stephanie Pincetl, Alison Lipman, Victoria Sork, Kyle Cavanaugh, Greg Okin, Juan Herrera, Mark Rosman, Alex Hall, David Shorter, and Luke Nikolov, and Travis Longcore.

3. Student Survey

The student survey was also developed using Google Forms. Like the faculty survey, we used key informant interviews to inform the development of the student survey. The survey was distributed in several ways. It was emailed to the following Student Affairs Officers (SAOs) who then sent it out to students in their majors: Jessica Angus (Ecology and Evolutionary Biology), Mimi Baik (Civil and Environmental Engineering), Myrna Dee (Anthropology), Royce Dieckmann (Institute of Environment and Sustainability), Kathy Escobedo (Political Science), Inna Gergel (Integrative Biology and Physiology), Justyna Glode (Chemistry/Biochemistry), Vanessa Hernandez (Civil and Environmental Engineering), Lauri Holbrook (Earth and Planetary Space Sciences), Nancy Jensen (Theater, Film, and Television), Megan Lebre (Neuroscience), Denise Lopez (Atmospheric and Oceanic Sciences), Susana Luis (Environmental Health Sciences), Jenée Misraje (Geography), Janel Munguia (English/Literature and the Environment), Stephen Pilcher (American Indian Studies), Shahla Rahimzadeh (Food Studies Minor), Maverick Santos (Society and Genetics), Sarah Sarchin (Art), and Dylan Sarnowski (Psychology). It was also sent to the following professors who then sent the survey to students in their respective classes: Moana McClellan (Food Studies Cluster), Noah Garrison (Environment M10), Leryn Gorlitsky (Ecology and Evolutionary Biology 100), Alison Lipman (Ecology and Evolutionary Biology 100), and Eric Scerri (Chemistry 14A and 14B). We also contacted some of our UCLA peers via GroupMe and text messaging to take the survey, and also sent the survey link to GroupMe chats with students who were in several classes (Ecology and Evolutionary Biology 100, Ecology and Evolutionary Biology 162, Chemistry 14C, and Geography 128), teams (UCLA Rugby Team and UCLA Water Polo Team), and clubs (the Coastalong Festival and the Gamma Phi Beta sorority).

Results

Faculty Survey Results

A total of 21 faculty members responded, representing 14 departments, indicating that faculty across a wide range of disciplines including the arts, humanities, and social sciences are interested in engaging with Sage Hill.

Table 1: Faculty respondents from each department

Department	# of Faculty
American Indian Studies	1
Anthropology	1

Atmospheric and Oceanic Sciences	2
Civil and Environmental Engineering	1
Earth, Planetary, and Space Sciences	1
Ecology and Evolutionary Biology	1
English	1
Environment and Sustainability	6
Geography	1
Gender Studies	1
Psychology	2
Sociology	2
Theater Film and Television	1

1. Courses

The faculty survey results show a strong desire from faculty to teach courses at Sage Hill. Of the 21 faculty respondents, 19 (90.4%) expressed interest in teaching undergraduate courses at Sage Hill. More specifically, seven respondents (33.3%) indicated that they would be interested in teaching a course at Sage Hill in the upcoming 2020-2021 academic school year. One faculty member described Sage Hill as a “teaching and conservation treasure.” In addition, 28.5% of faculty had already taught courses at Sage Hill. There was interest in teaching courses in a variety of disciplines including Anthropology, Atmospheric and Oceanic Sciences, Ecology and Evolutionary Biology, English, Environment, Film and Television, Gender Studies, International Development Studies, Life Sciences, Public Affairs and Urban Planning (Table 2).

Table 2: Courses faculty are interested in teaching at Sage Hill

Anthropology C117 - Experimental Archaeology
Anthropology 205 - Zooarchaeology
Anthropology 212 - Stone tool technology
Atmospheric and Oceanic Sciences 1 - Climate Change from Puzzles to Policy
Atmospheric and Oceanic Sciences 150 - Atmospheric & Oceanic Sciences Laboratory
Atmospheric and Oceanic Sciences 155 - Intro to Ecosystem-Atmosphere Interactions
Atmospheric and Oceanic Sciences 236 - Land Biogeochemical Dynamics
Ecology and Evolutionary Biology 116 - Conservation Biology
Ecology and Evolutionary Biology 18 - Why Ecology Matters: Science Behind Environmental issues

Ecology and Evolutionary Biology 100/100L - Introduction to Ecology and Behavior
Ecology and Evolutionary Biology 154 - California Ecosystems
English/Environment M30 - Environmental Literature and Culture
English 260 - Environmental Narrative
Environment 150 - Environmental Journalism
Environment 180 B/C - Practicum in Environmental Science
Environment 188B - Special Courses in Environment
Film and Television 410A - Symposium
Gender Studies /American Indian Studies
International Development Studies 191 - Variable Topics Research Senior Seminars
Life Sciences 7B - Genetics, Evolution and Ecology
Public Affairs/Urban Planning, Sustainable Urbanism or other environmental planning courses

Many faculty members had unique ideas for how Sage Hill could be implemented into their courses. For example, one faculty member wants to use the space for “documentary photography and film to develop collaborative environmental narrative and media projects”, while another faculty member wants to “run educational programs that delve into the area of environmental psychology and design a healing garden.” This emphasizes Sage Hill as a multi-use space for teaching diverse topics that cannot be taught in a conventional classroom.

According to the faculty respondents, the resources needed to effectively teach courses at Sage Hill include a concrete pad, storage and shelter, seating areas, proper access, informational signage, small fenced off areas around plants, binoculars, field notebooks, and field measurement instruments such as kits for plant, water, and soil analysis. Although there are many improvements that need to be made to the site, these resources are generally inexpensive compared to conventional laboratory equipment.

2. Research

The majority of faculty surveyed have had previous experience as a research mentor for undergraduate students. Specifically, 17 (80.9%) said they had previous experience, while 5 (23.8%) said they had not. Of the respondents, 14 (66.6%) reported interest in mentoring undergraduate research at Sage Hill. The research topics that faculty were interested in included an impressive array of disciplines (Table 3).

Table 3: Faculty research topics of interest

Traditional CA plant resources management
Hydrology

Communication, writing, media
Indigenous pedagogy
Effects of UCLA development on environment
Bioremediation; microbiomes; environmental chemistry and toxicology; bioremediation; plant-microbe interactions; soil biodiversity
The use of plants to treat health disorders
Carbon and water balance of native plants, development of experiments and monitoring equipment
Comparative biodiversity in Los Angeles
Environmental planning with a focus on green infrastructure and heat
Conservation, restoration
Ecological restoration, light and noise pollution

UCLA faculty respondents rated incentives that would make them more likely to become mentors for undergraduate students. The top rated incentives include adequate funding for students (50%), funding for research expenses (50%), logistical support (50%), recognition for mentoring undergraduate researchers (33.3%), opportunities to publish research with students (27.8%), and access to proper mentoring support (11.1%). Other incentives mentioned include financial support for faculty (5.6%), the recognition of student's intellectual contributions (5.6%), course release (5.6%), and the incentive to move back to Los Angeles (5.6%).

Student Survey Results

We obtained responses from 217 UCLA undergraduates representing all classes of students: Freshmen (21%), Sophomores (23%), Juniors (25%), and Seniors (30%). These students represent 35 majors and 26 minors indicating that students from a variety of majors took part in our survey and are interested in Sage Hill (Tables 4 and 5). Of the student respondents, 118 (54%) had at least one minor.

Table 4: Percent of respondents from each major

Major	% of Respondents
Environmental Science	26.0%
English	14.8%
Biology	13.0%
Molecular, Cell, & Developmental Biology	6.5%
Psychobiology	5.5%

Political Science	4.6%
Economics	3.7%
Geography and Environmental Studies	3.2%
Psychology	2.7%
Ecology, Evolution and Behavior	2.3%
History	1.8%
Neuroscience	1.8%
Physiological Sciences	1.8%
Sociology	1.8%
Business Economics	1.3%
Microbiology, Immunology, & Molecular Genetics	1.3%
Undeclared	1.3%
Applied Math	0.9%
Global studies	0.9%
Human Biology and Society	0.9%
Public Affairs	0.9%
Chicana/o studies	0.4%
Cognitive Science	0.4%
Communication	0.4%
Ethnomusicology	0.4%
French	0.4%
Gender Studies	0.4%
Linguistics	0.4%
Marine biology	0.4%
Math	0.4%
Philosophy	0.4%

Table 5: Percent of respondents from each minor.

Minor	% of Respondents
Conservation Biology	15.5%
Environmental Engineering	13.7%
Food Studies	13.7%
Environmental Systems and Society	12.8%
Public Affairs	4.5%
Geographical Information Systems and Technology	3.6%
Spanish	3.6%
Cognitive Science	2.7%
Film	2.7%
French	2.7%
Global Health	2.7%
Professional Writing	2.7%
Anthropology	1.8%
Atmospheric and Oceanic Science	1.8%
Disability Studies	1.8%
Education	1.8%
Geography/Environmental Studies	1.8%
Music Industry	1.8%
Accounting	0.9%
Chicano Studies	0.9%
Entrepreneurship	0.9%
Geography	0.9%
Japanese	0.9%
Labor Studies	0.9%
Literature and the Environment	0.9%
Statistics	0.9%

1. Courses

Our student survey results show that a many UCLA undergraduates are interested in taking a course at Sage Hill. Of the respondents, 70.5% said that they would be likely or very likely to take a course at Sage Hill, 20.7% were neither likely nor unlikely, and 8.8% were unlikely or very unlikely to do so. Students highlighted several reasons why they would want to enroll in a course taught at Sage Hill. One student mentioned how it would be interesting to take a course surrounded by native California habitat, while others expressed how Sage Hill would be a welcome change in scenery from the traditional classroom setting and that it would create a learning environment that is better for their mental health. One student said that taking a class at Sage Hill would be beneficial because, “spending time in the natural environment is important for both the mind and spirit.” Another student indicated that learning outside creates a, “less stressful environment, and learning about something through a hands on experience makes the experience more meaningful.” On the other hand, students who indicated that they would not be likely to enroll in a class highlighted several reasons for their answers. Some students stated that they do not believe outdoor learning would be efficient, while others mentioned the distance of Sage Hill from other parts of campus as a concern. Some also indicated that none of the courses mentioned interested them. Nonetheless, most respondents want to take a class at Sage Hill, and there was a strong interest in many classes (Table 6), with the most requested topics being Ecology/Restoration Ecology, Conservation Biology/Biodiversity, Botany, Health and Wellness, Psychology/Human Behavior, and Environmental Justice.

Table 6: Classes that students are interested in taking at Sage Hill

Class	% of Students Interested
Ecology/Restoration Ecology	63.6%
Conservation Biology/Biodiversity	62.7%
Botany	55.3%
Health and Wellness	50.2%
Psychology/Human Behavior	43.3%
Environmental Justice	41.5%
Field Methods/Research Techniques	40.6%
Zoology/Taxonomy/Animal Behavior	38.7%
Environmental Humanities	33.2%
Geology/Social Science	31.8%

Traditional Ecological Knowledge	30.4%
Film/Digital Media	27.6%
Geography	25.8%
Visual Arts	25.8%
Environmental Engineering	19.4%
American Indian Studies	18.5%
Literature	0.5%
Permaculture	0.5%

2. Research

A majority of student respondents (82.5%) stated that they had never conducted independent research for course credit. Only 16.6% of respondents said that they had, but 70.6% of respondents said that they would be interested in conducting field based research. On the other hand, 29.4% said that they would not be interested. While a majority of students expressed a desire to conduct outdoor research, several impediments were expressed that would prevent them from doing so. The biggest obstacles that students face are: time constraints (57.4%), lack of transportation to field sites (46.3%), lack of faculty members available to oversee the research (36.3%), personal financial situation (28.1%), lack of research funding (1.7%), limited access to sites (1.2%), and lack of information/guidance (0.8%).

Discussion

An overwhelming majority of faculty have indicated that they would like to teach courses at Sage Hill, and many of them have also expressed interest in becoming a research mentor for undergraduate students. Similarly, most students who took this survey show a desire to conduct outdoor research and take a field-based course. All of this highlights the demand from both students and faculty for courses and research at Sage Hill.

There was interest across a wide range of disciplines including the arts, humanities, and social sciences. This indicates that Sage Hill could be the site of a variety of classes and research projects. Similarly, students expressed a high level of interest in courses ranging from health and wellness to environmental justice, underscoring the diverse interests that students have. Many students also indicated that taking a field-based course would be beneficial for their mental and physical health, demonstrating that taking a class outside would help reduce the stress that they face on a day-to-day basis as UCLA students. Students and faculty from several departments and majors completed our survey, showing that Life Science students and faculty are not the only ones interested in outdoor learning and research. Therefore, we recommend that a variety of classes and research in addition to the traditional ecology-based classes and research be offered at Sage Hill.

When developing Sage Hill, several things must be taken into consideration. It will be important to address many of the resources that faculty mentioned, including seating areas, proper access to the site, field measurement instruments, and storage areas. Although there are many improvements that need to be made to the site, these resources are generally inexpensive compared to conventional laboratory equipment. It is also vital to consider the incentives that faculty members mentioned. If Sage Hill is to become a well-developed site for teaching and research, these incentives will be very important to keep in mind. Incentives will help ensure that faculty have the tools to remain committed to conducting research and teaching classes at Sage Hill.

Students mentioned several barriers that would prevent them from conducting research, such as time constraints, a lack of faculty members, and lack of transportation methods to field sites. Many students have extremely busy schedules, meaning that a lack of time is the biggest impediment that most students face. This is very important to consider as Sage Hill is developed. Lack of transportation, however, could become less of an issue because Sage Hill is located on campus and is walking distance from many apartments. Students' concern about finding faculty members to oversee their research may also not be as large an issue, as our faculty survey results indicate that many faculty members would be willing to serve as undergraduate research mentors.

While it is apparent that both faculty and students are interested in Sage Hill, it will be vital to provide adequate resources to faculty as well as solutions to many of the impediments that students face as a strategic plan for the future of Sage Hill is developed. Sage Hill is a unique site that offers an accessible space for field-based learning and research on UCLA's campus. Creating an undergraduate research program at Sage Hill that matches faculty mentors to interested students will open up opportunities to engage students across multiple disciplines.

Appendix 2: Details for Scenarios to Transform Sage Hill

Basic Plan

The Basic Plan includes the minimum level of clean up, site improvements, supplies, and personnel required to facilitate classes and undergraduate research at Sage Hill. This plan, which can be administered quickly and with a relatively modest budget, will transform the site from a neglected space to a monitored area that is clean and safe for students to explore. The following improvements and support will allow the site to host six courses per year (two per quarter) and three student research projects.

Improvements

- Clean up trash: A thorough clean up is needed to remove trash that has been left from recreation and educational use of the space.

- Remove large debris: Sage Hill has been used to dump large items including an old mattress and a large fiberglass tank. There are also defunct irrigation pipes that need to be removed.
 - Note: We successfully removed the large fiberglass tank on May 20, 2020, funding was provided by a \$5,500 TGIF grant from ASUCLA.
- Trail: The current trail is a primitive, narrow, treaded path with several steep sections. The path must be made wider and safer through reinforced steps. With oversight, trail improvements could potentially be accomplished as a student research or design project.
- Waste Bins: Add additional waste bins to control the trash brought into the site.
- Water Source: The water source on site currently leaks and needs to be repaired.
- Access: Sage Hill is currently accessed by an indirect route via Bellagio Drive to the north. A more direct route would greatly facilitate use of the area.
 - Note: Housing & Hospitality Services has plans, as part of the Lot 15 project, to create an access point to Sage Hill from the south, through the area currently known as the Boneyard. This access route would be ADA compliant, a required component for teaching spaces.
- Webpage: The webpage would provide information about Sage Hill, have a link for scheduling requests, and would showcase opportunities at Sage Hill.

Supplies and Equipment

- Hand tools: shovels, shears, trowels, gloves,
- Plant nursery supplies: pots, soil, seeds, hoses, plants tags, etc will allow for the start of the nursery to support rehabilitation of the site.
- Teaching Supplies: Classes on site will require basic materials such as field guides, notebooks, clipboards, etc.

Personnel

- Faculty Director: A faculty director is needed to steer all aspects of the future of the site. They would be compensated with summer stipend and have primary duties including:
 - oversee operations
 - liaise with UCLA units (Facilities Management, Capital Programs, and Housing and Hospitality Services)
 - collaborate with faculty to partition space and time and prioritize uses
 - maintain records and produce annual reports
 - chair the Sage Hill Faculty Advisory Committee .
- Graduate Student Researcher - 1 quarter: The graduate student would assist the faculty director and also work with faculty to pilot class exercises and labs, as well as help undergraduate researchers launch projects.

Moderate Plan

The Moderate Plan creates a more expansive and advanced Sage Hill. The moderate plan includes all the basic improvements plus some key alterations to better run classes and

create research opportunities. The Moderate Plan further builds the Sage Hill team to support more use of the site. This plan is estimated to sustain 15 classes and six projects per year.

Improvements

- Low profile rustic benches in key spots: Sage Hill currently has just one seating area that includes a few benches in poor condition. Seating in additional areas is needed to accommodate students and faculty while engaging in class activities. Inexpensive, low profile, rustic benches would create seating without distracting from the wildland aesthetic. These could be constructed as part of a student design project.
- Storage facility: As the amount of supplies and equipment for courses and research increases, a modest-sized secure storage facility will be needed .
Additional signage: A welcome sign at a new south entrance will be needed, as well as additional smaller signs around the perimeter for posting information, access, and rules of use.
- Advanced website and social media presence: A full website would serve many functions including scheduling, hosting a database of past projects, highlight restoration progress, and showcase stories about students and classes. Social media presence and the website would allow for sharing the great work and opportunities that occur at Sage Hill.

Supplies and Equipment

- Binoculars: for advanced birding activities
- Camera traps: for viewing and monitoring animal movements and nocturnal activity
- Sampling equipment: for course activities
- Kits for plant, soil and water analysis: requested by faculty
- Fencing around experimental plots: to protect ongoing experiments

Personnel

- Site Manager - full time: An essential full time site manager will allow for many more courses and student researchers to use Sage Hill. They would be responsible for handling logistics, course and research support, maintain plant nursery, and be an additional liaison between campus operation and Sage Hill.
- Graduate Student Researcher: - 4 quarters- A year-round graduate student position will boost the number of classes and research projects that can be supported at Sage Hill..

Fully Supported System

The fully supported system creates an impressive field site right on campus by providing a state of the art outdoor classroom. The fully supported plan also continues to build the team by adding an administrative assistant to help upkeep the website and handle the budget. In addition, this plan includes a strong and well-funded undergraduate research program with a combination of supply grants and research scholarships. The program would further reduce

barriers to students participating in research by supporting them or their projects financially. This plan is estimated to be able to support a full mockweek of classes and 12 to 15 projects.

Improvements

- Outdoor classroom and full scale plant nursery: In collaboration with Housing and Hospitality Services, the current Boneyard site will be transformed into a space that houses an outdoor classroom and plant nursery. The classroom will enable a more formal class setting and allow for many other types of courses and activities at Sage Hill.
- Marketing campaign: The goal of the campaign is to spread awareness about Sage Hill and the opportunities available on site to increase undergraduate involvement in courses and research.
- Healing and meditation space: Adding a dedicated place of well-being outdoors, in nature, would be welcomed by students and faculty. The space could also host courses focused on meditation and mindfulness.

Personnel

- Administrative Assistant: As use of Sage Hill increases, an administrative assistant will be needed to help with the budget, process expenses, schedule use, maintain the website, and support the faculty director and faculty advisory committee.

Program Funds

- Undergraduate Research Program: The Sage Hill undergraduate research program will create a field research experience right on UCLA's campus by providing students and faculty mentors and an easily accessible site. Students will have the opportunity to create and submit proposals via the Sage Hill website where they will then be reviewed by a faculty committee that will decide which projects will be conducted. The research program will promote both undergraduate research experiences and undergraduate publishing opportunities. The program hopes to reach about 20 projects per quarter with a combination of supply grants and research scholarships. The program will be available to students of all years and majors, as student interest has been displayed all across campus from English to environmental science majors. This plan will fund the research program with a combination of supply grants and research scholarships. This would further reduce barriers to students participating in research by supporting them or their projects financially.
 - Research grants for supplies and expenses: 10/year, \$500-\$1000 each
 - Research Scholarships: 4/year, \$4,500-\$6,000 each

Appendix 3: GIS Map

A CAD file drawing of the campus map was obtained from UCLA Capital Programs. The CAD file was georeferenced to the base layer and converted into a GIS shapefile.

The base layer imagery was obtained from ESRI through the ArcGIS website:

http://goto.arcgisonline.com/maps/World_Imagery

The Sage Hill boundary was manually created as a polygon feature with the guidance of the UCLA Advisory Task Force on Sage Hill Report.

An orthomosaic of Sage Hill was provided by Kyle Cavanaugh, which was clipped to the boundary of the polygon feature. The transparency of the surrounding base layer outside of the polygon feature was set to 40%.

The inset map was obtained through the UCLA website:

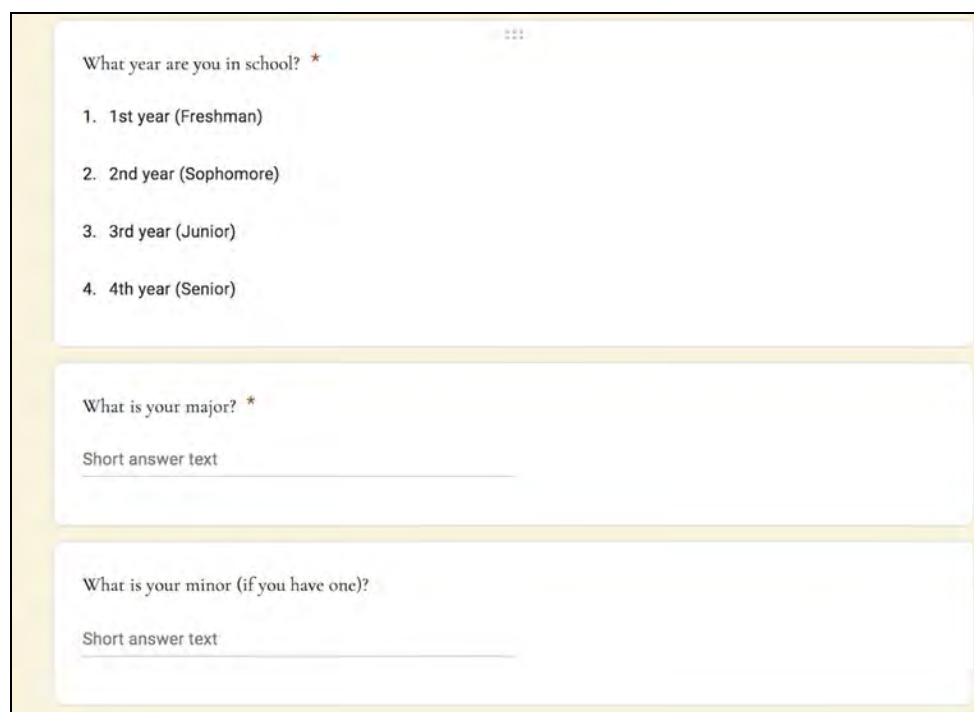
<http://map.ucla.edu/downloads/>

The three hypothetical zones of Sage Hill could not be accurately delineated because we were unable to conduct a field visit and collect precise data points. Thus, we added labels for the zones, but we did not create exact borders on the GIS map.

Appendix 4: Survey Questions

The following are screenshots of our Faculty and Student Surveys, which were created via Google Forms.

Student Survey:



The screenshot shows a Google Form titled "Student Survey" with three questions. The first question is "What year are you in school?" with a red asterisk, followed by a numbered list of four options: "1. 1st year (Freshman)", "2. 2nd year (Sophomore)", "3. 3rd year (Junior)", and "4. 4th year (Senior)". The second question is "What is your major?" with a red asterisk, followed by a "Short answer text" input field. The third question is "What is your minor (if you have one)?", followed by another "Short answer text" input field. The form is set against a light yellow background.

Current Research



Description (optional)

Have you conducted independent research for course credit? (199 or Honor's thesis) *

- ☐ Yes
- ☐ No

If yes, what type of research were you involved in?

- ☐ Primarily lab-based
- ☐ Primarily library-based
- ☐ Primarily field-based, off campus

Prospective Research



Description (optional)

Are you interested in conducting independent research in an outdoor, nature-based setting? *

- ☐ Yes
- ☐ No

What is the biggest obstacle you have/ would have to overcome in order for you to conduct independent outdoor, nature-based research? *

- ☐ Time constraints
- ☐ Lack of transportation to field sites
- ☐ Lack of faculty mentors
- ☐ Personal financial situation (e.g. needing to work)
- ☐ None
- ☐ Other...

What is the second biggest obstacle you have/ would have to overcome in order for you to conduct independent outdoor, nature-based research? *

- ☐ Time constraints
- ☐ Lack of transportation to field sites
- ☐ Lack of faculty mentors
- ☐ Personal financial situation (e.g. needing to work)
- ☐ None
- ☐ Other...

Sage Hill

Description (optional)

Have you heard of Sage Hill? *

- ☐ Yes
- ☐ No
- ☐ Not Sure

Have you visited Sage Hill? *

- ☐ I have never been there
- ☐ Rarely (I've been there once or twice)
- ☐ Sometimes (1-4 times per year)
- ☐ Often (monthly or more)

What activities did you engage in while visiting Sage Hill? *

- ☐ Class activity
- ☐ Enjoying nature
- ☐ Socializing with friends
- ☐ Student group activity
- ☐ Research project
- ☐ Spending time alone
- ☐ Other...

Future Planning

Description (optional)

If classes were offered at Sage Hill what topics would you be particularly interested in? *

- ☐ American Indian Studies
- ☐ Botany
- ☐ Conservation Biology/Biodiversity
- ☐ Ecology/Restoration Ecology
- ☐ Environmental Engineering
- ☐ Environmental Humanities
- ☐ Environmental Justice
- ☐ Field Methods/Research Techniques
- ☐ Film/Digital Media
- ☐ Geography
- ☐ Geology/Soil Science

- ☐ Health and Wellness
- ☐ Psychology/Human Behavior
- ☐ Traditional Ecological Knowledge
- ☐ Visual Arts
- ☐ Zoology/Taxonomy/Animal Behavior
- ☐ Other...

How likely would you be to enroll in a class taught at Sage Hill? *

	1	2	3	4	5	
Very UNLIKELY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very LIKELY

If likely, why?

Short answer text

If unlikely, why not?

Short answer text

Any additional comments you'd like to add?

Short answer text

Faculty Survey:

Name: *	Short answer text
Department(s): *	Short answer text
Title: *	Short answer text
Email: *	Short answer text

Sage Hill Questions		<	+
Description (optional)			
Have you heard of Sage Hill? *			
<input type="radio"/> Yes			
<input type="radio"/> No			
<input type="radio"/> Maybe			

How often do you visit Sage Hill? *

1. I have never been there
2. Rarely (I have been there once or twice)
3. Sometimes (1-4 times per year)
4. Often (monthly or more)

COURSES



We are eager to increase the use of Sage Hill as a setting for courses across the disciplines, for example; habitat assessment and restoration, traditional ecological knowledge, climate change modeling, psychological benefits of nature, environmental justice, art, and more.

Have you already taught courses at Sage Hill? *

- ☐ Yes
- ☐ No

What course? (Department, Course #, Title) *

Short answer text

How did you incorporate Sage Hill into your course? What do you have students do there? *

Short answer text

Are you interested in teaching at Sage Hill in the future? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Which course(s)? (Department, Course #, Title, or indicate new course) *

Short answer text

How do you propose to use Sage Hill for your course(s), what would you have students do there? For example, experience nature, perform observations, conduct labs, learn field techniques, run experiments, take surveys, etc. *

Long answer text

What type of resources or support would you need to successfully teach your course(s) at Sage Hill? *

Long answer text

Are you interested in teaching your course(s) in the upcoming 2020-2021 academic year? *

- ☐ Yes
- ☐ No
- ☐ Maybe

Which of the following would make it more likely for you to be a research mentor?

- ☐ Funding for students
- ☐ Funding for research expenses
- ☐ Logistical support
- ☐ Access to mentoring resources (e.g., best practices)
- ☐ Opportunity to publish with students
- ☐ Recognition for mentoring undergraduate researchers
- ☐ Other...

RESEARCH

We are also interested in supporting undergraduate students who want to conduct research at Sage Hill and we are looking for faculty willing to be mentors.

Have you been, or are you currently, a research mentor for an undergraduate student? *

- ☐ Yes
- ☐ No

Are you interested in mentoring undergraduate students who want to conduct nature-based research at Sage Hill? *

- ☐ Yes
- ☐ No
- ☐ Maybe

What research topic(s) would you want to focus on as a research mentor?

Short answer text

COMMENTS



Description (optional)

Any questions or comments you'd like to add?

Long answer text

Would you like to be included in an email list for faculty interested in Sage Hill? *

☐ Yes

☐ No