UCSB Campus Flora Project
Final Report July 1st, 2008- February 28th, 2010

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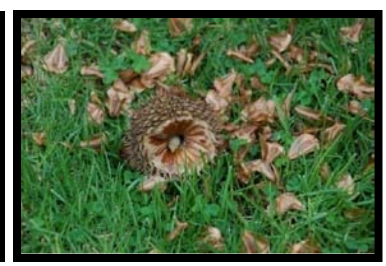
  

Introduction

The University of California, Santa Barbara is located in a Mediterranean climate. The dry summers and mild, wet winters allow an incredibly diverse assemblage of plants to thrive in the area. The founders of UCSB, especially Dr. Vernon Cheadle who served as Chancellor from 1962 until 1977, recognized the special opportunity to enhance the campus with unique plantings. Dr. Cheadle had a vision of developing the campus into an outdoor classroom, which would not only serve as an educational tool but would also create an environment of great beauty.

The Campus Flora Project was initiated on July 1, 2006 with funding from the Elvenia Slosson Foundation. With additional funding provided in July of 2007, faculty, staff, graduate and undergraduate students and community volunteers, continued working to successfully accomplish the goals of the Campus Flora Project.

Goals/Objectives

During the third year of funding, the goal of the Campus Flora Project continued to conduct plant surveys, photograph, georeference, and catalog the plants of UCSB. We are enhancing interactive web map that spatially conveys the plant data gathered. Also we are finishing the organization of the valuable notes and records kept by former UCSB greenhouse managers and began development of additional brochures and updated the main Campus Flora web page.

During the last nineteen months (July1st, 2008 –28 February 2010), the Campus Flora team has successfully accomplished the following:

- Identified and georeferenced 5000 individual plants
- Identified over 300 species of mostly trees and large shrubs
- Continued development and completed a few of the informational web pages on specific plants and plant families
- Continued photography for mapped specimens and web pages
- Completed two additional brochures (Palms and Ethnobotanical)
- Completed data entry of a majority of mapped specimens including but not limited to the following information: family, genus, species, locality, and GPS location
- Completed review of accession books from former UCSB Greenhouse Managers, spanning from 1963 until 1992.
- Launched the Campus Flora interactive map on faster web page (URL: http://earth.geog.ucsb.edu/campusflora/)
- Posted pictures of species on webmap. We continue to collect photos to include important morphological features of the plants (leaves, bark, flower, fruit, etc.) for posting
- Lead flora walking tours for students, staff and community members

Discussion

The Campus Flora Project Committee includes many prominent members of the scientific community in Santa Barbara and continues to provide volunteer support for project team members. Dr. Bruce Tiffney, the Dean of the College of Creative Studies and a Geology faculty member at UCSB, is using the positive press generated by the Campus Flora project. The renewed interest in the plants on campus has enabled him to garner further faculty support of the project with the ultimate goal of reinstatement of the Campus Landscape Sub-committee. This committee will review design plans for new landscaping and provide recommendations for species that will further enhance the campus plant collections. Dr. Robert Muller of the Santa Barbara Botanic Garden and author of *Trees of Santa Barbara* has provided insights regarding identification of trees and labeling techniques. John Bleck, UCSB greenhouse manager from 1978-1992, identified one thousand plant specimens for the team and has provided advice regarding care for existing unique plants on campus. He has also reviewed his greenhouse records that will provide historic information about the planted specimens on campus. Randy Baldwin of San Marcos Growers has worked with Mr. Bleck to identify campus trees.

Rachel Alford serves as Project Manager for the Campus Flora Project. Rachel has been responsible for scheduling all the committee meetings, organizing the plant identification sessions, and coordinating the graduate and undergraduate student assistants. Michael McDaniel, a Geography department graduate student, continued to collect GPS data points of plants on campus, gathered and entered information regarding those plants, and edited and enhanced the interactive map to present all the information in a user-friendly format. Lindsay Salzman, an undergraduate student in the Environmental Studies program organized and gathered species information for plant lists, web pages and walking tour brochures.

Between December 16, 2007 and February 28th 2010, a total of $22,200 has been spent on salaries, benefits, supplies and direct costs. We were able to update our software and produce a copious amount of walking tour brochures for future distribution. A faster, lighter laptop was purchased to make collection and processing of data much more efficient.

Outcomes of the Project

Education

In the last nineteen months opportunities have arisen allowing the Campus Flora team to educate many diverse groups about the unique assemblage of plants on our campus.

Vacationing alumni, parents of incoming students, nursery managers, community gardeners, UCSB staff and botany students were guided through the flora. Instructional topics varied from propagation techniques for unique species to plant adaptations for herbivory defense. Members of the Campus Flora team also worked with instructors on campus to develop curriculum for several courses.

Website

The Campus Flora website set up is completed with helpful links for navigating. We continue to plan and work on the development of the informational web pages. These pages will contain data regarding all aspects of the featured plants including care and culture information helpful to home gardeners, city arborists and facilities managers. The web pages will be a source of the most up to date and reliable data available for the species and plant families discussed.

More pictures featuring different morphological features of the plants and GPS points will be added when funding is attained.

Using Google Analytics, we have found that the webmap has been viewed in 65 Californian cities, 26 states and 23 countries.

Future Work

As funding is attained, project members will continue taking GPS points of plants until the flora of the main campus has been mapped. Since we have completed three walking tour brochures (Exotic, Palms, Ethnobotanical), we hope to continue developing these tours to include specimen like Coral Trees and Conifers. The original Campus Flora brochure and these supplementary brochures are available for download from the website. The team will continue work with Goleta Valley Beautiful and Physical Facilities to plant several new trees on campus.

Additional Collaborations

Collaboration with the Geography department at UCSB will provide web hosting for the interactive web map and technical assistance for the GIS software used in creating the map valued at $20,000.

UCSB faculty member Dr. Carla D'Antonio has loaned the Campus Flora team her Trimble Geo XH Handheld GPS unit. This unit, when combined with post processing software has allowed for the mapping of plant specimens to 10 cm accuracy. The unit is valued at $13,000 and the Terrasync and Pathfinder software that we used with it are valued at $3000. The Cheadle Center has recently purchased its own Trimble unit and will loan it to the Campus Flora project as needed.

Images:

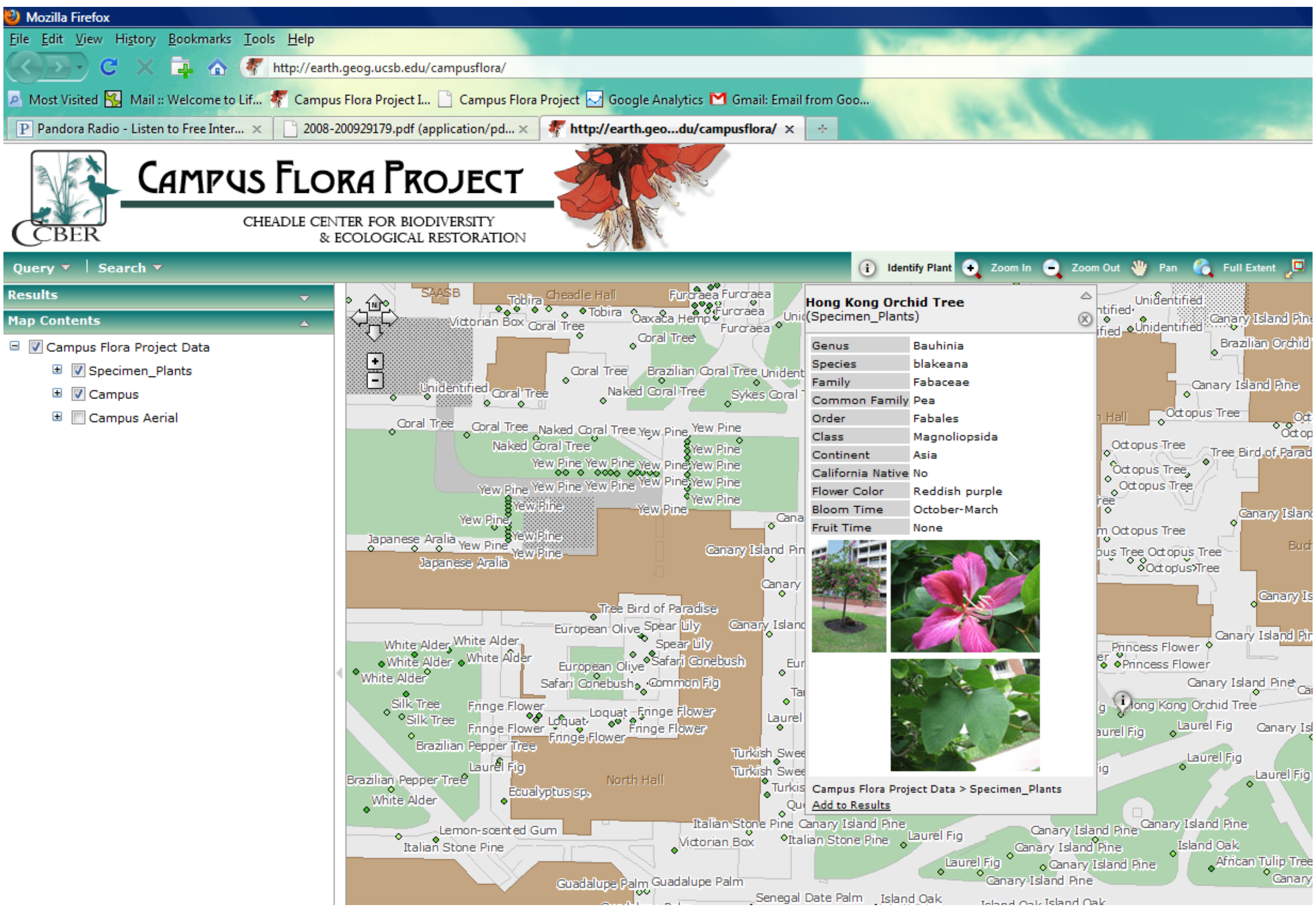
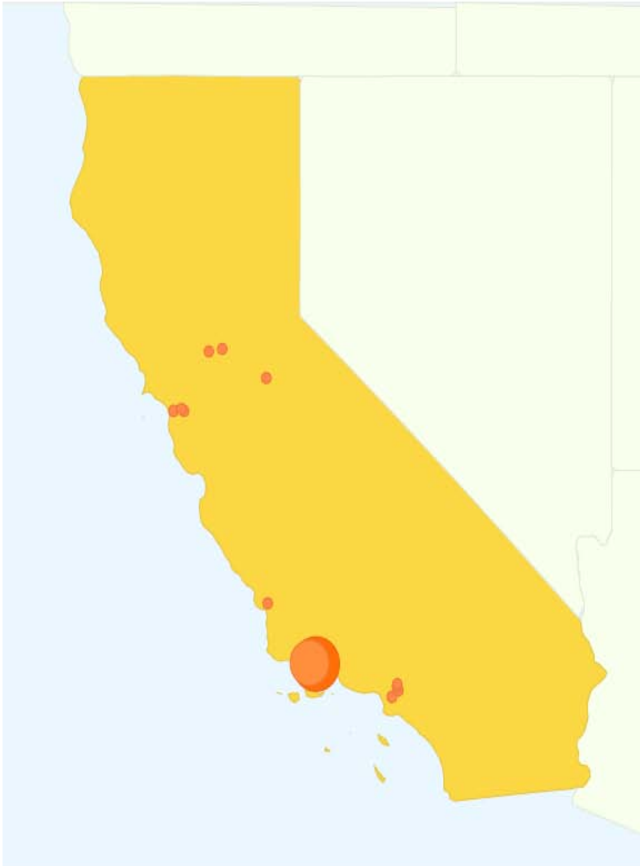


Image 1: Campus Flora Webmap http://earth.geog.ucsb.edu/campusflora/



Site Usage

Visits	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
362 % of Site Total: 98.64%	1.29 Site Avg: 1.28 (0.30%)	00:01:34 Site Avg: 00:01:33 (1.38%)	35.36% Site Avg: 36.24% (-2.43%)	81.77% Site Avg: 82.02% (-0.30%)

City	Visits	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
Santa Barbara	193	1.39	00:02:13	23.32%	77.72%
Goleta	151	1.17	00:00:46	44.37%	87.42%
Los Angeles	3	1.00	00:00:00	66.67%	100.00%
San Francisco	3	1.33	00:00:04	100.00%	66.67%
Monterey Park	3	1.33	00:00:22	66.67%	66.67%
San Luis Obispo	2	1.50	00:00:33	100.00%	50.00%
Sacramento	1	2.00	00:22:56	100.00%	0.00%
Oakland	1	1.00	00:00:00	100.00%	100.00%
South Pasadena	1	1.00	00:00:00	100.00%	100.00%

Image 2: Campus Flora Webmap usage in California over a one month period

Image 3: Student involvement – Botanical illustrations by UCSB art students were used in several Campus Flora publications.

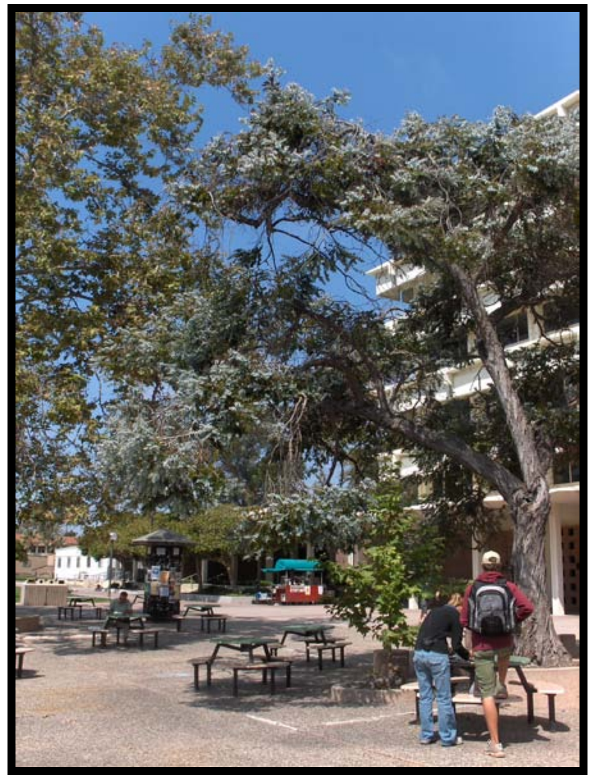


Image 4: Rare specimens included in collection – Top left: *Howea belmoreana* Top right: *Eucalyptus crenulata* Bottom center: *Pinus torreyana*

PALMS

Arecaceae walking tour

University of California Santa Barbara

PALM WALK

The University of California, Santa Barbara is an institution that prides itself on diversity. This commitment extends to the ornamental horticulture found throughout the campus. UCSB is home to over 25 interesting palm species. This tour provides an opportunity to see eleven palms that provide a distinctive element in the landscape at UCSB.

= Feather Palm = Fan Palm

1. DATE *Phoenix dactylifera.* This grey-colored palm is native to North Africa and Western Asia, and has been cultivated for over 8,000 years for its edible fruit. *Dactylifera* means "bearing fingers" which refers to the appearance of the date fruits upon the flower stalks. The plants will rarely bear fruit in Santa Barbara since they require higher temperatures.

2. JELLY *Butia capitata.* This palm has grey, downward flexed foliage arising from a stubble of old leaf bases. The flower stalks of this Brazilian native are initially protected in a large, woody, boat shaped bract that is often employed as a vessel by flower arrangers. The cream to maroon flowers give rise to sweet tasting, orange-yellow fruit, which may be used to make a tart jelly or wine.

3. CHILEAN WINE *Jubea chilensis.* Charles Darwin described this palm as ugly when he saw it in Chile, but it is now widely grown for its massive structure. Grey foliage is borne atop a broadly bottle-shaped trunk. Tassels of flowers emerge from a thick, protective sheath with an orange interior. The flowers develop into yellow fruits bearing edible kernels. In Chile the palm is prized for its sap, which is fermented to make wine, a practice that has drastically reduced wild populations of this elegant tree.

4. MEXICAN FAN *Washingtonia robusta.* These palms are closely related to California's only native palm (*W. filifera*), and are difficult to distinguish on first glance. Both are large plants, reaching 80-100 feet. If left untrimmed, they are marked by a dangling skirt of old, grey leaves that create great habitat for birds, lizards and rats. *W. robusta* tends to have a thinner trunk, darker green leaves with a deep red splotch at the base of the stalk, and a more spherical crown of leaves, than does *W. filifera.*

5. FISHTAIL WINE *Caryota urens.* The leaflets of this Southeast Asian palm are elongate triangles, much like fish tails. All species are "monocarpic," meaning once they reach a certain size, they proceed to flower from the top to the bottom of the tree and then die. The fruits of *Caryota* possess oxalic acid, and are irritating to the skin and should not be eaten.

6. KING *Archontophoenix cunninghamiana.* Native to the rainforests of eastern Australia, the King Palm is listed as rare though not threatened with extinction. The leaf bases encircle the trunk, forming a green "crown shaft" below the leaves. Masses of purple flowers hang below the crown shaft and produce bright red fruits. Often clusters of flowers and fruits are present on the same trunk, creating a colorful sight.

7. EUROPEAN FAN *Chamaerops humilis.* This species grows in the Mediterranean area and is the only palm native to Europe. It can survive temperatures below -6.66 degrees Celsius (20° F), is fairly fast growing, and is also drought resistant. It tends to sprout at the base, creating clumps of upwardly arching stems, covered with thick fibers. The leaf stalks have needle-like, forward-pointing spines. The clumps of yellow flowers are often obscured by the dense crown.

8. WINDMILL *Trachycarpus fortunei.* This palm is native to China and is the most cold-hardy of all cultivated palms. It has been known to survive in the snow even when completely defoliated. The stout and stiff leaves stand rigidly away from the thick fiber-covered trunk. The seeds are used medicinally and are believed to have cancer-fighting properties, while the trunk fibers may be used to line hanging baskets.

9. QUEEN *Syagrus romanzoffiana.* These South American palms have elongate feathery foliage with drooping leaflets borne on a smooth grey trunk ringed with old leaf scars. Large clusters of creamy flowers are borne at the base of the crown and emerge from a 3 to 4-foot-long protective, boat-like bract that is elegantly ribbed. The flowers mature in summer to yield showy orange, edible fruits. In its native locations, the durable stems are used for pier pilings.

10. PYGMY DATE *Phoenix roebelenii.* This slow growing palm from Southeast Asia can grow both indoors and outdoors due to its hardy nature and small stature. Clusters of creamy yellow flowers mature into red-brown to dark purple fruit. Lower leaflets at the base of the stem are modified needle-like spines and can be quite painful.

11. PARADISE *Howea forsteriana.* This palm is native to Lord Howe Is., Australia. The leaflets have an elegant droop which produces a graceful appearance. The stem base is swollen and has strongly marked leaf scars that look like rings. This palm is often found in interior landscapes, flourishing in hotel lobbies and ballrooms. The Sentry Palm (*H. belmoreana*) is a rare relative restricted to the sandy soils of the same island. One individual is located on the east side of Davidson Library on campus.

AN OUTDOOR CLASSROOM

Dr. Vernon Cheadle, Chancellor of UCSB from 1962 until 1977, recognized the special opportunity and favorable circumstances of this botanically rich and unique environment. He had a vision of developing the campus into an outdoor classroom, which would not only serve as an educational tool but would also create an environment of great beauty. Art, Biology, Environmental Studies, Geography, and Geology classes make use of the unique and beautiful plants in UCSB's landscape.

We hope you will enjoy this tour.

Visit our Campus Flora Project Interactive Map http://earth.geog.ucsb.edu/CampusFlora

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CAMPUS FLORA PROJECT

This tour proceeds along Lagoon Road on the East side of campus starting at the Engineering Science building. Each palm has a corresponding numbered point and picture.

Image 5: Palm Walking Tour Brochure. Link located at (http://ccber.lifesci.ucsb.edu/collections/flora/) for all of our walking tour brochures.