

DRAFT January 2021



2.0

PLANNING CONTEXT

- 2.1 Campus Planning History
- 2.2 UCSC Main Residential Campus
- 2.3 UCSC Westside Research Park



▲ Aerial photo of the UC Santa Cruz Campus, 2017

2.1 Campus Planning History

In 1957 the University of California Board of Regents approved an initiative to found three new UC campuses, a response to the post-World War II birth rate boom as well as robust immigration and resulting state population growth. The campuses were to be located in the San Diego area, the greater Los Angeles area, and the southern San Francisco Bay Area. Local advocates, UC alumni, and city representatives ultimately succeeded in convincing the Regents to locate the campus in Santa Cruz. The site chosen was a portion of the Cowell Ranch.



▲ Cowell and Stevenson Colleges, 1966



▲ Aerial photo of the Santa Cruz campus from the 1963 LRDP

Cowell Ranch Site and Legacy

For thousands of years, Ohlone Native Americans lived in the Santa Cruz Mountains as well as along the coast of what is now Santa Cruz County. These native people were the ancestors of what is now the Amah Mutsun tribal band.

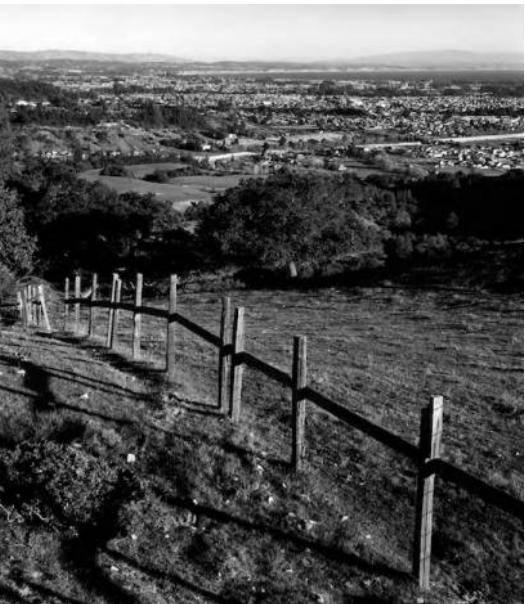
The land on which we gather is the unceded territory of the Awaswas-speaking Uypi Tribe. The Amah Mutsun Tribal Band, comprised of the descendants of indigenous people taken to missions Santa Cruz and San Juan Bautista during Spanish colonization of the Central Coast, is today working hard to restore traditional stewardship practices on these lands and heal from historical trauma.

Amah Mutsun Relearning Program,
www.ucsc.edu/landacknowledgement

Settlements arose around the Santa Cruz Mission as trade and agriculture activities flourished in the area. In the second half of the 19th century, timber harvesting and lime production, in service of rapid post-Gold Rush growth, became major drivers of the local economy. By the 1880s, lime production was operated by the Cowell Lime and Cement Company. Following a decline in lime manufacturing in the early 20th century, the Bay Street kilns were closed. However, operations continued in the Upper Quarry and agricultural operations also continued at the site until its acquisition by the Regents from the Cowell Foundation for the university campus.

In 2005, with widespread interest in preserving the historic legacy of the site and structures, the Cowell Lime Works Historic District was defined and named to the National Register of Historic Places. The management, maintenance, and improvements to the remaining buildings and structures continue, including a notable recent rehabilitation of the historic Hay Barn. The Historic District marks the main entry to the campus, serving as the gateway to campus amenities and programs for visitors and the community.

DRAFT January 2021



UCSC Founding Vision

The University of California acquired approximately 2,000 acres of the Cowell Ranch for the new campus. Plans for the campus were shaped in large part by the thinking of Clark Kerr, UC President, and Dean McHenry, the first Chancellor of UCSC. They were intent on creating a different type of campus, one that balanced the aspirations of a large research institution with more intimate and innovative opportunities for teaching and learning.

... the intent is to combine the advantages of a small college with the facilities of a great university. . . the opportunity seems great to combine patterns of learning and living, as well as to make use of new methods of instruction, study, and communications.

1963 Long Range Development Plan

The campus lands comprising meadows, forests, and ravines, were unique among any existing UC campuses, and had an energizing effect on the designers tasked with planning the new campus.

Two objectives, then, influenced the physical planning: implementation of a strong educational concept that suggested certain plan relationships; and respect for a strong site that brought unique possibilities and, at the same time, limitations in planning.

1963 Long Range Development Plan

To a greater extent than any of us have faced heretofore, the buildings are less important in the visual composition than the trees. Instead of remaking the land, the land must remake our standard conceptions of buildings and plaza and parking lot.

Thomas D. Church, Landscape Architect

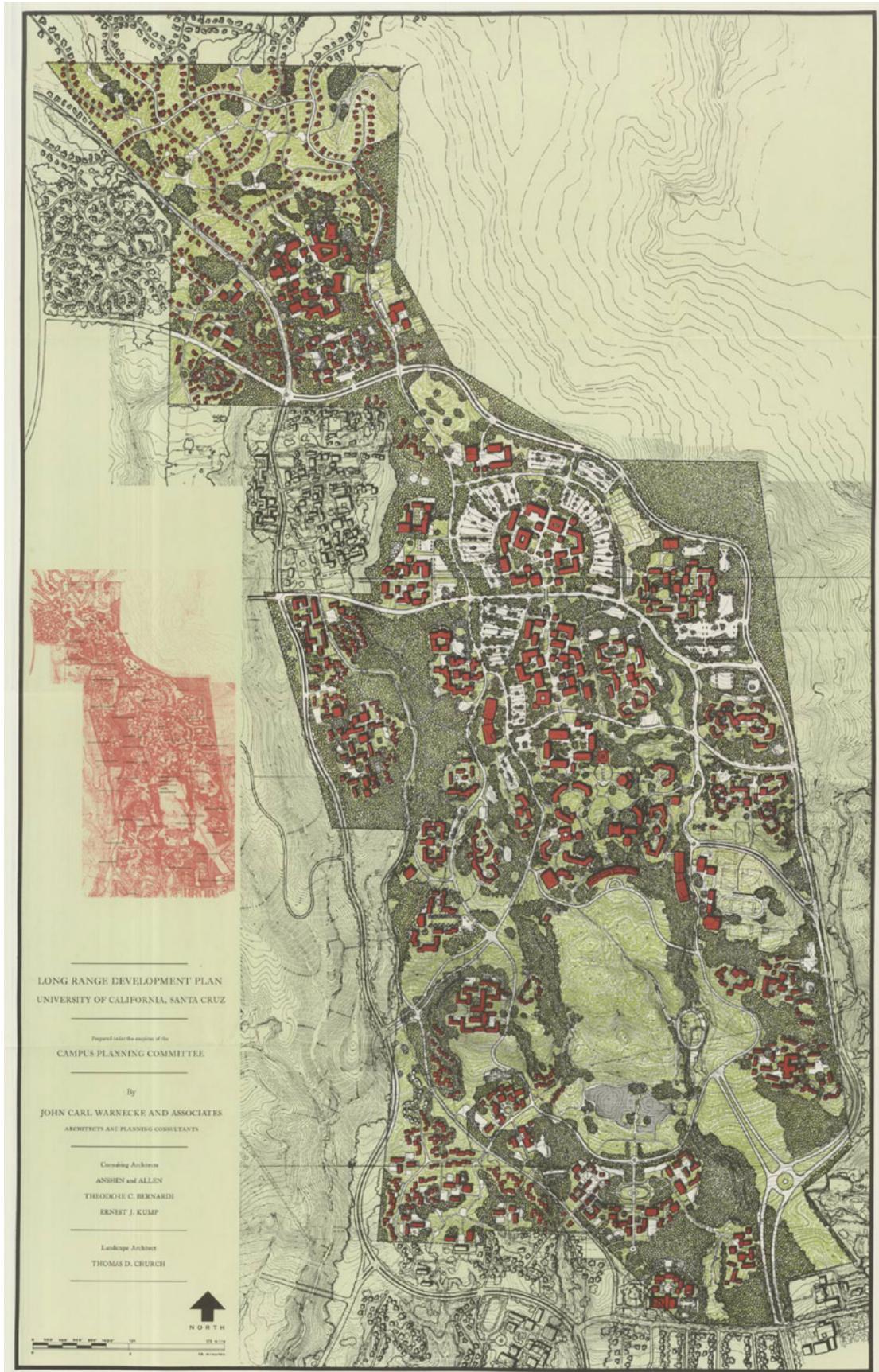
The first Long Range Development Plan for UC Santa Cruz was approved in 1963. Several key principles guided the plan:

The core of the campus, containing the library and central academic area. . . should be centrally located for accessibility. . . individual residential colleges. . . should be within a 7-1/2 minutes walking distance of the center of the campus.

1963 Long Range Development Plan

The campus was planned to include 27,500 students (reaching that enrollment by 1990), fifteen to twenty residential colleges, an academic central core, professional schools, housing for at least 50 percent of students, as well as areas for commercial or affiliated entities.

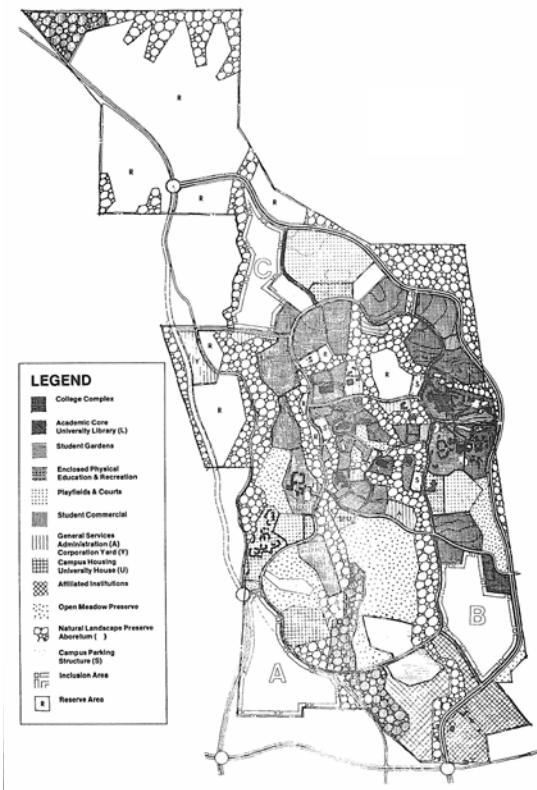
The Illustrative Plan (Figure 2.1) and the Functional Use Diagram (Figure 2.2) from the 1963 plan illustrate a distributed pattern of development throughout the majority of the 2,000 acre site, much of it in a relatively low density configuration intended to weave among the various physical constraints of the campus. These first plans also clearly established a basic circulation system to serve the development and retained the Great Meadow and other entry areas as major open space.



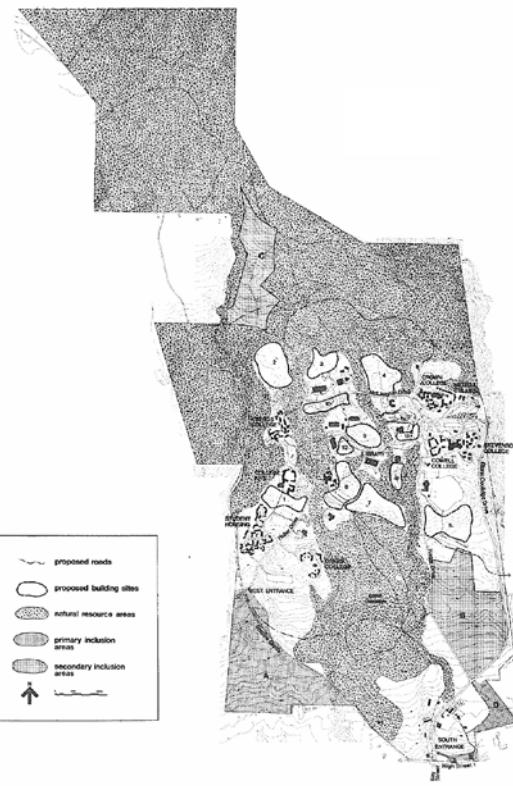
▲ Figure 2.1 1963 LRDP Illustrative Plan



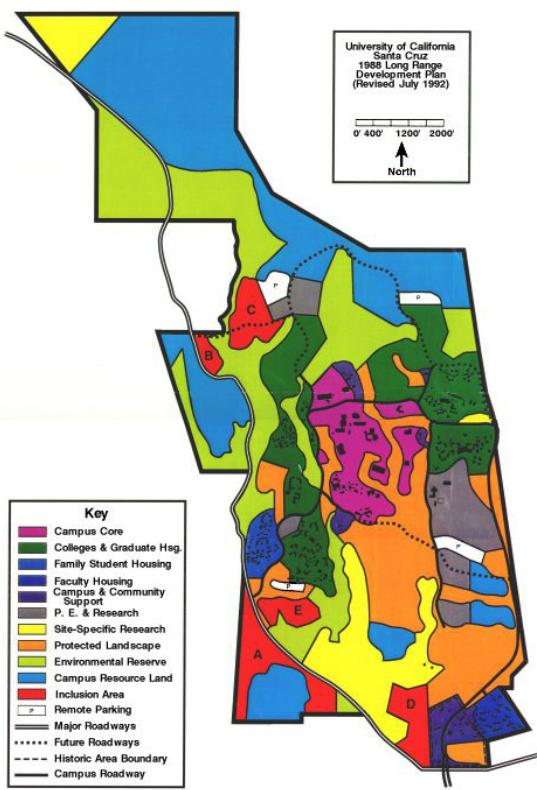
▲ Figure 2.2 1963 LRDP Functional Use Diagram



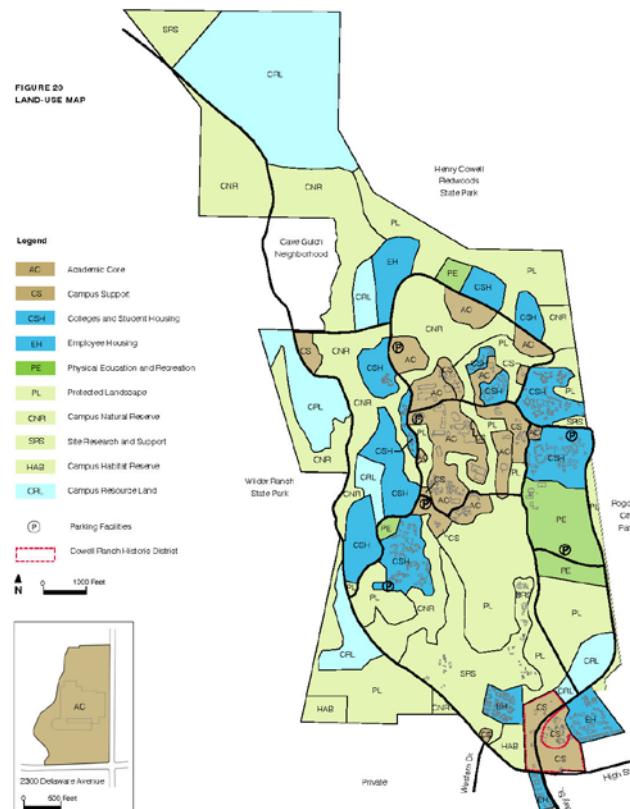
▲ Figure 2.3 1971 LRDP Land Use Plan



▲ Figure 2.4 1978 LRDP Land Use Plan



▲ Figure 2.5 1988 LRDP Land Use Plan



▲ Figure 2.6 2005 LRDP Land Use Plan

Subsequent Growth and Change

Subsequent LRDPs have continued to guide UCSC as it has evolved from a big idea with a small initial enrollment to its current status as an acknowledged leader in research and sustainability as well as an educational institution dedicated to the success of diverse students.

1971: Natural Resource Areas and Slower Anticipated Growth (Figure 2.3)

While projecting a slower pace of growth than that assumed in 1963, the 1971 LRDp continued to plan for a 27,500 enrollment to be achieved by 2000 or later. It encouraged greater density in the academic core for convenience and the building of community. It also identified extensive natural resource areas as well as inclusion areas that could support the campus growth appropriately through services or facilities.

1978: Modest Growth Projections and Emerging Environmental Considerations (Figure 2.4)

The 1978 LRDp was influenced by state budget cuts and reduced enrollment projections. It identified energy conservation, preserving the natural environment, and close community relationships as high priorities. However, in response to state budget cutbacks and forecasts of lower enrollments statewide, the document planned for an enrollment of 7,500 and assumed a slower pace of growth than previous plans. It supported increasing density in the campus core with a clear delineation of appropriate building sites and identified extensive natural resource areas and four inclusion areas.

1988: Resumption of Growth through Compact Development and Enhanced Environmental Priorities (Figure 2.5)

The 1988 plan, covering a period from 1988 to 2004-05, grew from a detailed academic plan and program. The most comprehensive LRDp to that point, it planned for an enrollment of 15,000, with significant growth in the number of graduate students. The plan assumed robust growth in facilities: 7.5 million gross square feet of buildings, 12 residential colleges, and supporting infrastructure.

The plan demonstrated continuing commitment to stewardship of the unique natural site, encouraging a compact and functional academic and residential core area, limiting development in identified natural areas and establishing the Campus Environmental Reserve, areas to be set aside for teaching and research activities. The plan defined Protected Landscapes with ecological importance (wildlife corridors and sensitive vegetation) or aesthetic value. Areas in the north of the campus were designated as Campus Resource Land, with potential for future development, but to be maintained in their natural state in the interim.

2005: Balancing Capacity and Increased Growth with Community Concerns (Figure 2.6)

The 2005 LRDp planned for a horizon year of 2020. With expanding demand for a UC education, and increasing population and enrollment growth in the state, the plan initially contemplated an enrollment of 21,000, which was reduced to 19,500. At the same time, the LRDp maintained its commitment to resource conservation and the protection of natural resources. The plan proposed growth north, including a new northern loop road and connection on the west side of campus to Empire Grade.

The LRDp was followed by a Physical Design Framework, which was approved by the Regents in March 2008 and prepared as part of a pilot phase of the process redesign for approving capital improvement projects. The Physical Design Framework establishes general architectural and site design guidelines for campus area studies and projects.

UCSC Locations

Today UC Santa Cruz operates three campuses in the City of Santa Cruz: the main Residential Campus, the Westside Research Park at 2300 Delaware, and the Coastal Science Campus, a 100-acre property at the western end of Delaware Avenue on the west side of the city. As a research campus within the UC system, the Coastal Science Campus has a separate Coastal Long Range Development Plan and Program EIR, adopted by the Regents and certified by the California Coastal Commission in 2008.

This LRDp is concerned with two sites: the UCSC Main Residential Campus and the Westside Research Park (Figure 2.7).



▲ University of California Campus Locations

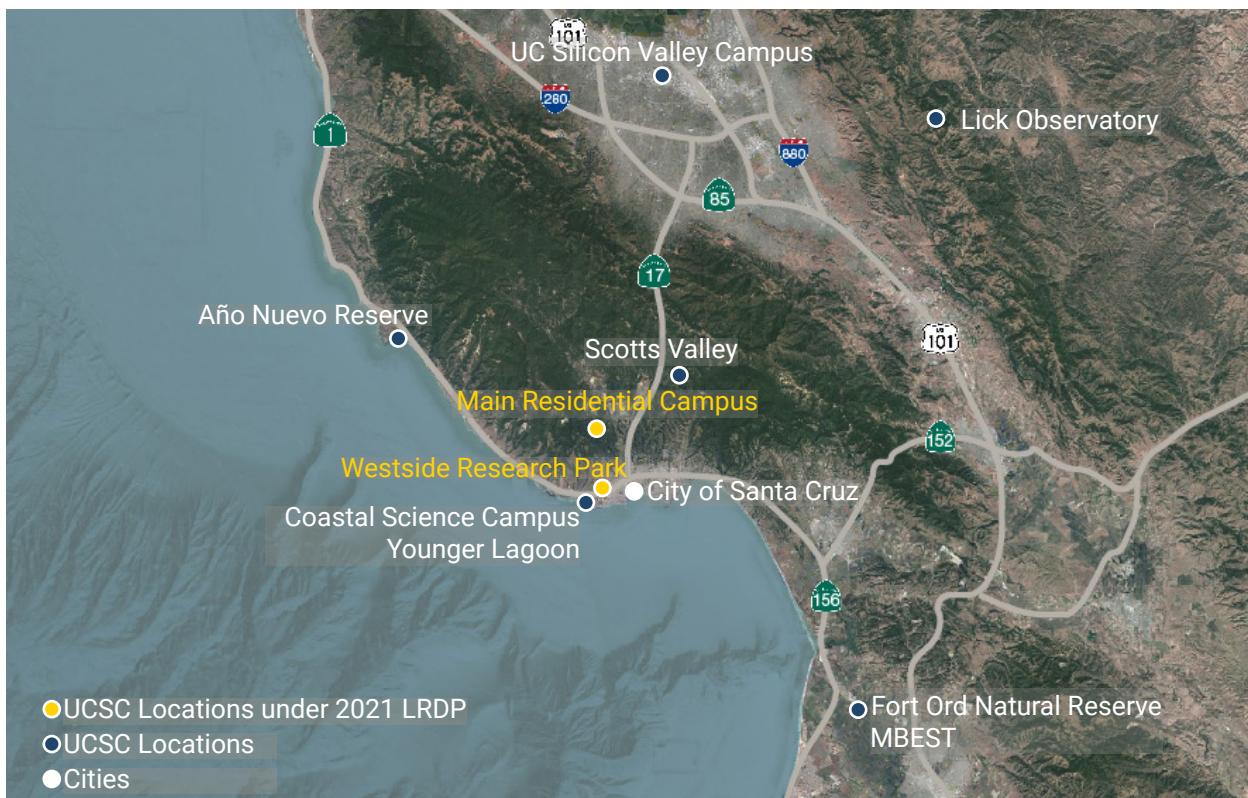


▲Figure 2.7 UC Santa Cruz Campus Context

1" = 16,800'

UCSC also operates several smaller off-campus facilities. These include a leased space in Scotts Valley supporting administrative uses, and the campus-owned UCSC Silicon Valley campus located in Santa Clara, which focuses on professional and certificate courses. UCSC also acquired 1,000 acres in 1994 at the former Fort Ord in Monterey County from the U.S. Army. Known as the Monterey Bay Education, Science, and Technology Center (MBEST), it includes approximately 600 acres that are designated as habitat reserve (Fort Ord Natural Reserve); the remainder includes the 500 acres that are planned for development as well as the existing MBEST Research and Development Center which hosts a variety of business, technology and research tenants (Figure 2.8).

UCSC has many research initiatives throughout the region. It serves as the headquarters for Lick Observatory, a renowned facility established in 1888, operated by the University of California Observatories (UCO) and located on Mount Hamilton in the Diablo Range above San Jose. UCSC also manages four University of California Natural Reserve sites: the previously mentioned Fort Ord Natural Reserve (600 acres), Año Nuevo Island Reserve (25 acres), Landels-Hill Big Creek Reserve (4,200 acres), and Younger Lagoon Reserve (72 acres), which adjoins the Coastal Science Campus.



▲ Figure 2.8 UC Santa Cruz Network

2.2 UCSC Main Residential Campus

Location and Setting

The approximately 2,000-acre UCSC main residential campus sits near the western edge of the City of Santa Cruz, with 53 percent of its land within the city and the rest in the County of Santa Cruz (Figure 2.9). The campus sits above residential neighborhoods, on a gently rising sequence of marine terraces. The lower portion of the campus is dominated by grassland meadows, while to the north the campus is dominated by a mix of redwood and evergreen forests and oak woodlands. The campus starts at an elevation of approximately 300 feet above sea level and rises at the most northerly extent to 1,200 feet, an overall rise of about 900 feet. Adding to this challenging topography, the central part of the campus is also cut from north to south by significant drainages, including Jordan Gulch and Moore Creek, that can be as deep as 70 feet and 350 feet wide in places.

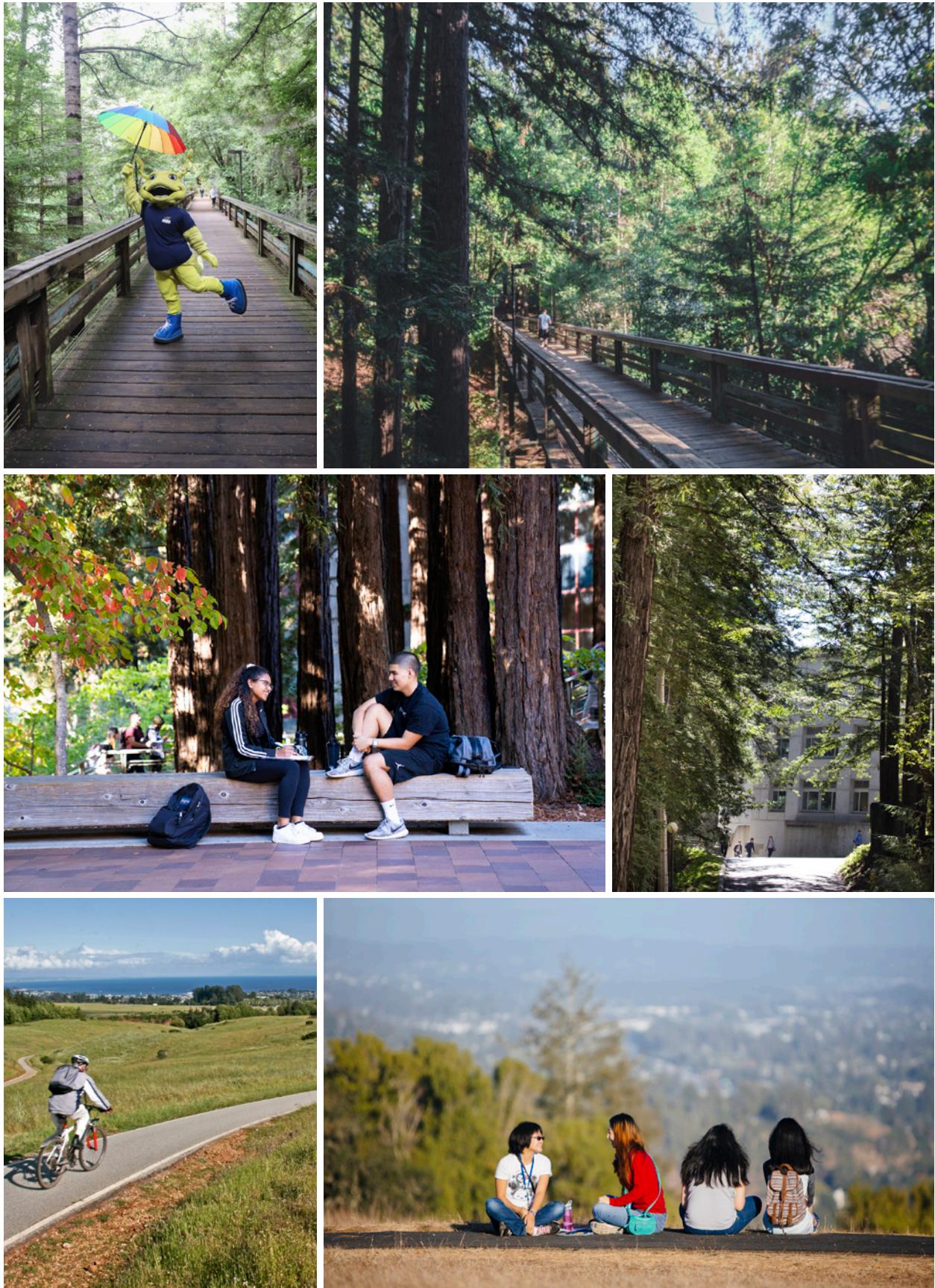
The north campus is undeveloped aside from long-term research plots, fire and maintenance trails, an emergency water storage tank and other minor infrastructure. The middle or central portion of the campus includes virtually the entirety of campus facilities, including academic buildings, student housing and support facilities, as well as parking, roads, walkways, and plazas. The southern portion of the campus includes the main residential campus entry at High and Bay Streets, the historic district, a facilities support yard, employee housing, as well as farm and arboretum uses.



▲Figure 2.9 Jurisdictional Boundaries



▲ Aerial photo of the UC Santa Cruz campus looking Southeast



Climate

The campus is in an area comprised of mountain ranges, valleys and coastal plains along the central coast of California. The climate of this area is characterized by dry summers, with fog and low coastal clouds, and moderately wet winters. From approximately April through August, high temperatures and low precipitation are the norm. The months from November through March are dominated by cooler temperatures and heavy rains. The area can expect on average approximately 30 inches of rain per year, but with considerable variability year to year. Though winters are typically mild, colder winds from inland regions with more continental climates can result in short-term cold snaps. Both summer and winter temperatures are moderated by the marine influence, and summer fog is a common occurrence. January temperatures range from a normal minimum of 39 degrees Fahrenheit ($^{\circ}\text{F}$) to a normal maximum of 61 $^{\circ}\text{F}$. July temperatures range from a normal minimum of 52 $^{\circ}\text{F}$ to a normal maximum of 75 $^{\circ}\text{F}$ (Western Regional Climate Center, 2016).

Prevailing winds are westerly most of the year shifting to east-southeast during the winter months, from November to February (Western Regional Climate Center, 2016). Winds seldom reach severe intensities, and much of the campus is sheltered from prevailing winds by hills and trees.

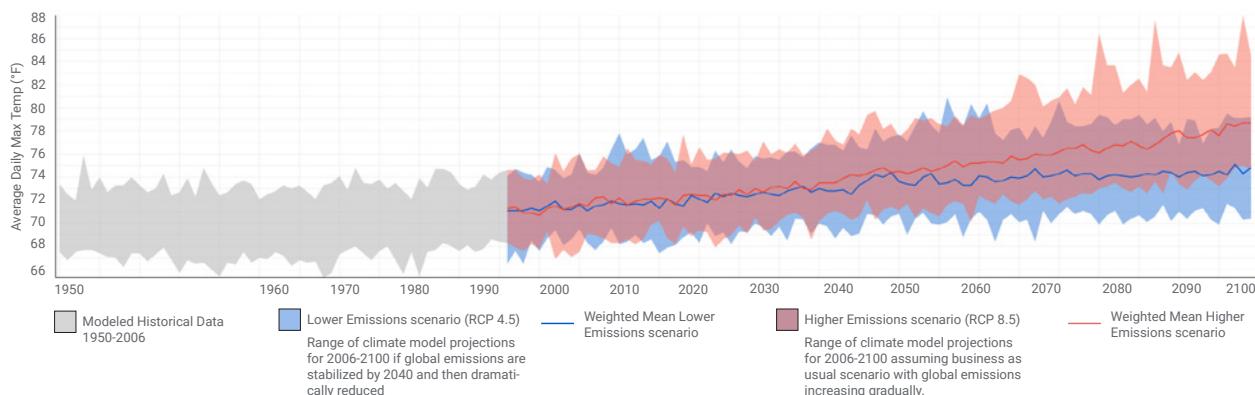
Climate Change and Resilience

Climate change is impacting the campus's physical setting and while bringing new issues and opportunities to the forefront of campus decision making. Specific impacts in the near term (2022-2050) and medium term (up to 2100) time frames will include (Figure 2.10):

- Rising temperatures due to increases in greenhouse gas emissions
- Increasingly intense rain events and frequent flooding due to changes in weather patterns
- Increasingly frequent and intense forest fires due to drier conditions and abundant dry fuel
- Higher sea levels and an expanding tide hazard zone due to the loss of glacial ice

The campus will be forced to adapt to these changes in the coming decades. Upholding the campus's commitment to stewardship of existing ecological resources and mitigating contributions to the drivers of climate change will also be important.

The campus will likely be affected by rising temperatures and complex interactions of multiple factors rather than any single driver. With the average annual maximum daily temperature projected increase of 4-7 $^{\circ}\text{F}$ depending upon greenhouse gas emissions, coastal areas should expect one more heat wave per year by 2050 and 4-8 by 2100 (California Department of Public Health, 2020). The rising temperatures will, at the same time, increase wildfire risk and severity (Figure 2.11).



▲ Figure 2.10 Climate Projections (US Federal Government, 2020)

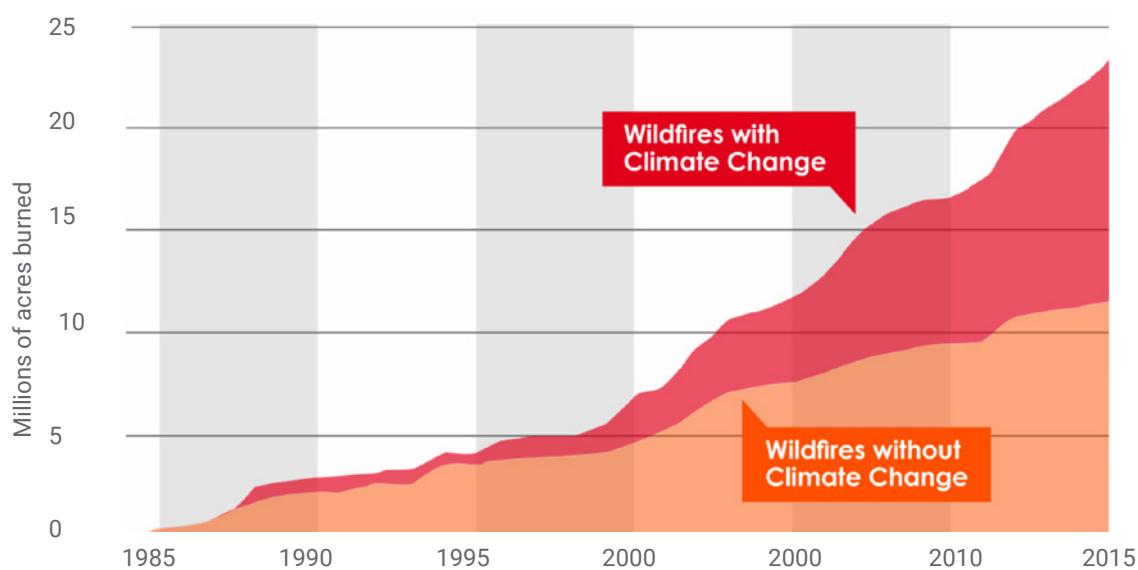
Physical resilience and climate adaptive strategies will continue to grow in importance for UC Santa Cruz, as the likelihood of catastrophic events increases. The recent 2020 San Mateo-Santa Cruz Unit (CZU) Lightning Complex fire demonstrated the campus's vulnerability to wildfire and the importance of emergency preparation and procedures. A full-scale evacuation was undertaken, which was made easier due to reduced activity on campus from the global public health crisis caused by Covid-19. Wildfire, flooding, and over-burdened critical infrastructure are likely to become more common requiring a renewed priority on both short-term responses, including evacuation and egress procedures, as well as long-term planning, including redundant power and water supplies and on-going vegetation management.

Wildfire

The Main Residential Campus and surrounding environs sit in a region of moderate to high wildfire severity based on the CAL FIRE Hazard Severity Zones. Potential danger exists for wildfires to occur both on and adjacent to the main residential campus.

The fire severity at the Westside Research Park ranges from moderate to high. Land to the north, east, south, and west of the Westside Research Park also ranges from moderate to high wildfire severity.

In the wake of the recent 2020 CZU Lightning Complex fire, the campus understands the importance of implementing wildfire hazard reduction practices to establish a fire-adapted community. It will be increasingly important for the campus to achieve wildfire preparedness and prevention, by instituting a combination of hazardous fuel reduction projects, fire prevention planning, and fire prevention education (Cal Adapt, 2020). Practices such as establishing defensible space and implementing building hardening features will also be pursued for new development.



▲ Figure 2.11 Wildfires and Climate Change (Wildfires and Climate Change: California's Climate Energy Future, 2019)



Site Ecology and Site Conditions

The UC Santa Cruz campus is located on the western flank of the Santa Cruz Mountains along the central portion of the California Coastal Range. The campus enjoys panoramic views overlooking the Monterey Bay and the Pacific Ocean. UCSC is uniquely situated within several distinct ecological habitats, including mixed conifer and coast redwood forest, coastal prairie, northern maritime chaparral, and riparian woodland.

The institution protects local biodiversity in several ways. UCSC's Campus Natural Reserves (CNR) designation is used to preserve approximately 800 acres for teaching and research. Two areas have been set aside as Campus Habitat Reserve, in coordination with the U.S. Fish and Wildlife Service to maintain high quality habitat for the California red-legged frog and the Ohlone tiger beetle, two federally designated endangered species. Much of the remainder of the undeveloped campus lands (513 acres) is currently designated as either Natural Space or Outdoor Research, intended to preserve lands valuable for teaching, research, biohabitat, recreation, or visual value.

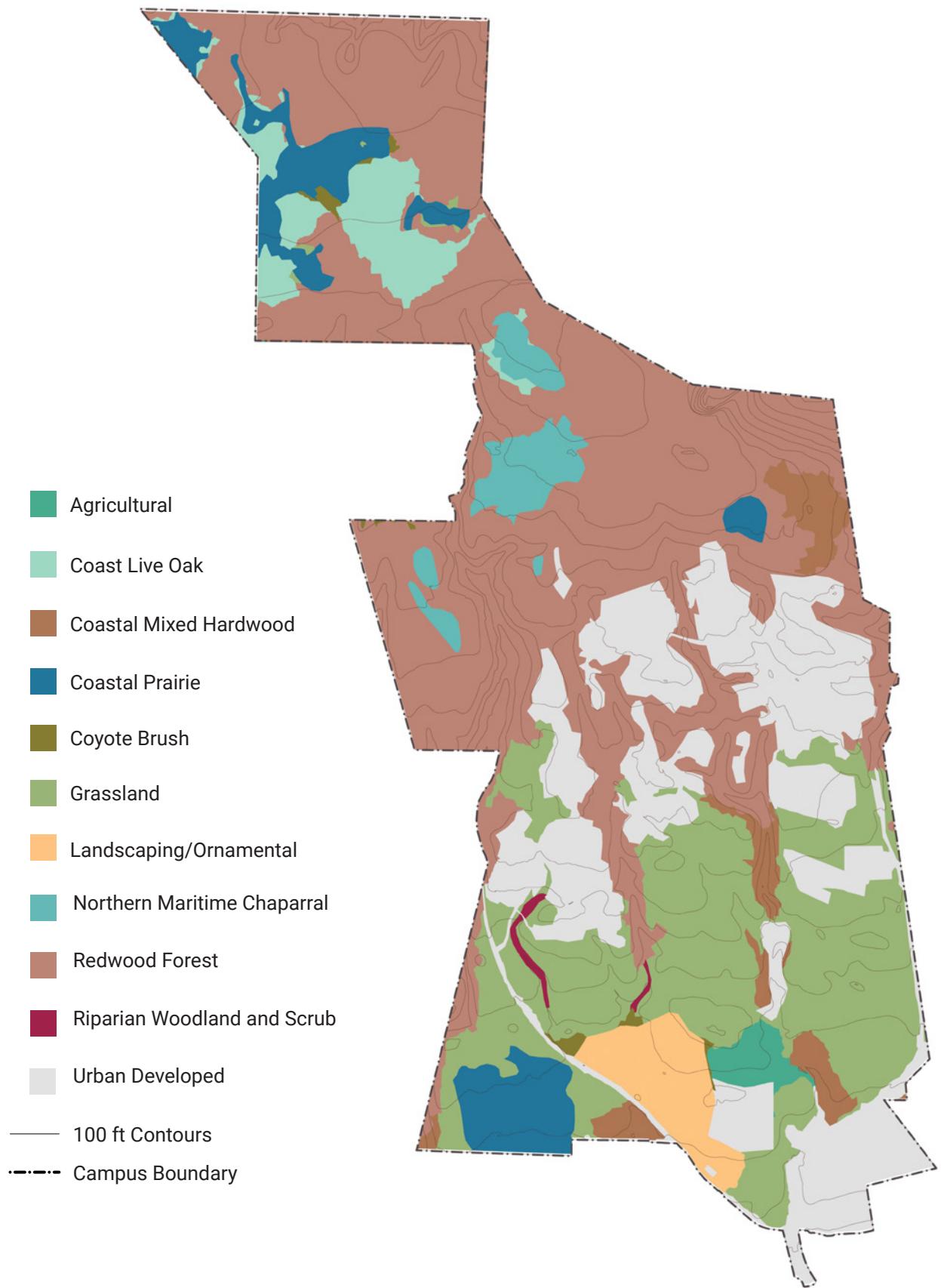
The Santa Cruz Mountains perform important ecological services to the entire region. The old growth redwood and riparian forests maintain soil fertility, filter water supplies, provide specialized habitat for endangered species, reduce risk of flooding, sequester carbon, and provide a visually stunning landscape. Redwood forests also maintain higher humidity than surrounding areas and can induce "fog drip," in which moisture in fog adheres to the redwood needles and drips to the ground. Fog drip is a unique function of the local ecosystem and is critical to the Santa Cruz watershed.

The campus is nestled between three major protected open space resources: Pogonip, a Santa Cruz city park on the east; Wilder Ranch State Park on the west; and Henry Cowell Redwoods State Park, which provides a rich and extensive regional resource supporting wildlife and natural processes, to the north.

The local ecology will continue to inform UCSC's campus planning and has informed this LRDP. Future development will consider the ecological services and biodiversity of the natural environment and seek to minimize disturbance where possible. As the UCSC Sustainability Plan notes, the campus natural environment offers unique advantages (Sustainability Office, 2019):

... to utilize the gift of the exquisite diversity of campus natural lands and built environment to benefit the UC's primary mission of teaching and research through student experiential learning opportunities; to intentionally work[ing] to build a culture of stewardship on campus; and to ensure the preservation and conservation of campus' natural resources...

Sustainability Office,
sustainabilityplan.ucsc.edu



▲ Figure 2.12 Main Residential Campus - Vegetation

1" = 2000'

Vegetation

Vegetation communities that exist in greatest abundance on campus include the following four groups: redwood, grassland, mixed evergreen forest (including coast live oak, coastal mixed hardwood, coyote brush and riparian woodland and scrub), and chaparral (Figure 2.12). Other localized and ecologically unusual or regionally uncommon plant communities in the north campus include coastal prairie and vegetation habitats that have developed around forest springs or seeps.

Redwood forest occurs throughout north campus and portions of central campus. It is dominated by coast redwood trees and contains a variety of tree canopy species [Douglas fir (*Pseudotsuga menziesii*), Pacific madrone (*Arbutus menziesii*), knobcone pine (*Pinus attenuata*), California bay (*Umbellularia californica*), and tan oak (*Notholithocarpus densiflorus*)]. The understory of these redwood forests is typically sparse except for shade-tolerant ferns and forbs.

In addition, habitat mapped as redwood forest may contain varying proportions of tree species or be dominated by tree species other than redwood in some areas. The redwood habitat consists of second-growth trees, since old-growth stands were heavily logged from early settlement times until the early 1900s and no old growth redwood habitat exists on campus. Distinct stands of “dwarf” redwood trees, which are under fifty feet tall, compared to typical adult redwood trees, which can grow from 100 to 300 feet tall, have been observed on campus and may warrant additional consideration due to the potential rarity of this community type. The understory of these redwood forests is typically sparse except for shade-tolerant ferns and forbs.

Grasslands occur primarily within lower parts of the central campus, including two grassland habitat areas referred to as the Great Meadow and the East Meadow. They include a variety of non-native species [slim oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), rattlesnake grass (*Briza maxima*), common velvetgrass (*Holcus lanatus*),

and Italian rye grass (*Festuca perennis*)] Meadows or openings in the redwood forests of the north campus also support coastal prairie communities. The lower campus grasslands are rolling and gently sloping, divided by two north/south canyons with densely forested slopes. Originally composed of native perennial bunch grasses, they are now intermixed with nonnative grasses. The existing native grass species include California oat grass (*Danthonia californica*), purple needlegrass (*Stipa pulchra*), California bromegrass (*Bromus carinatus*) and a diverse assemblage of native forbs, including coyote thistle (*Eryngium armatum*), wild hyacinth (*Triteleia hyacinthina*), dwarf brodiaea (*Brodiaea terrestris*), and yampah (*Perideridia kelloggii*). The patches of native grasslands in this area, characterized by Mima mounds typically found in grassland habitat, are considered coastal prairie, a distinct plant community and a sensitive habitat type.

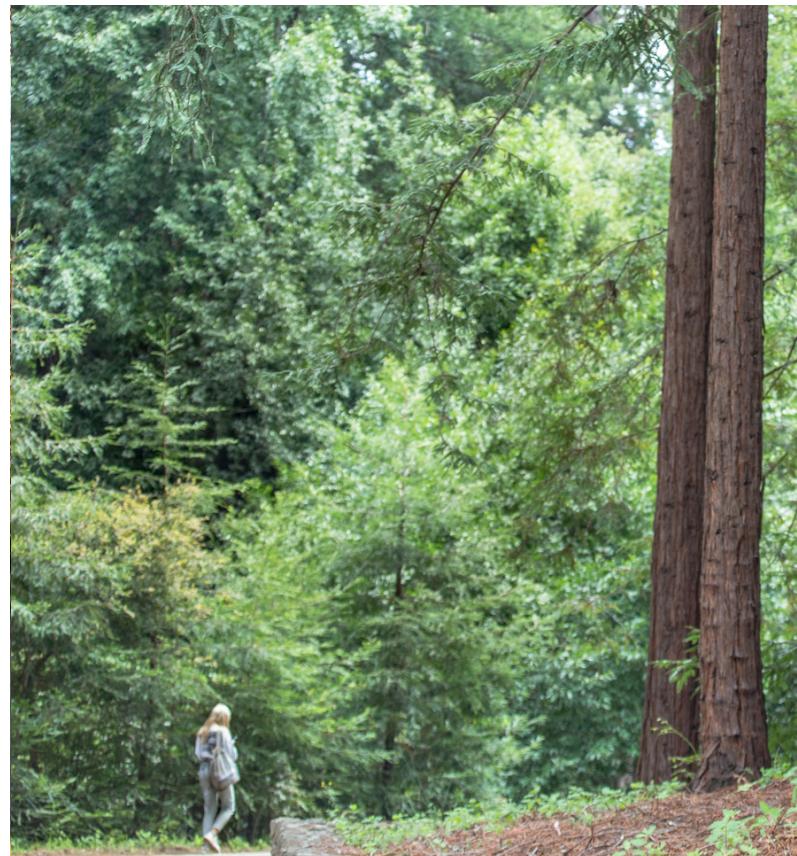


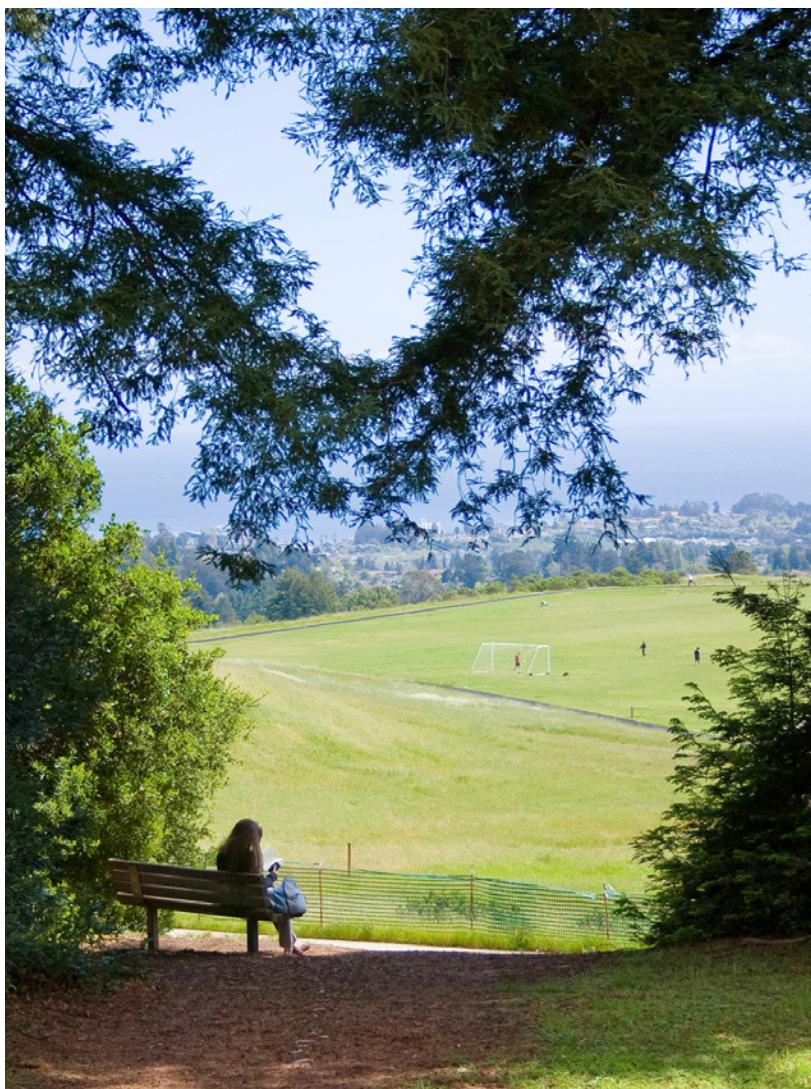
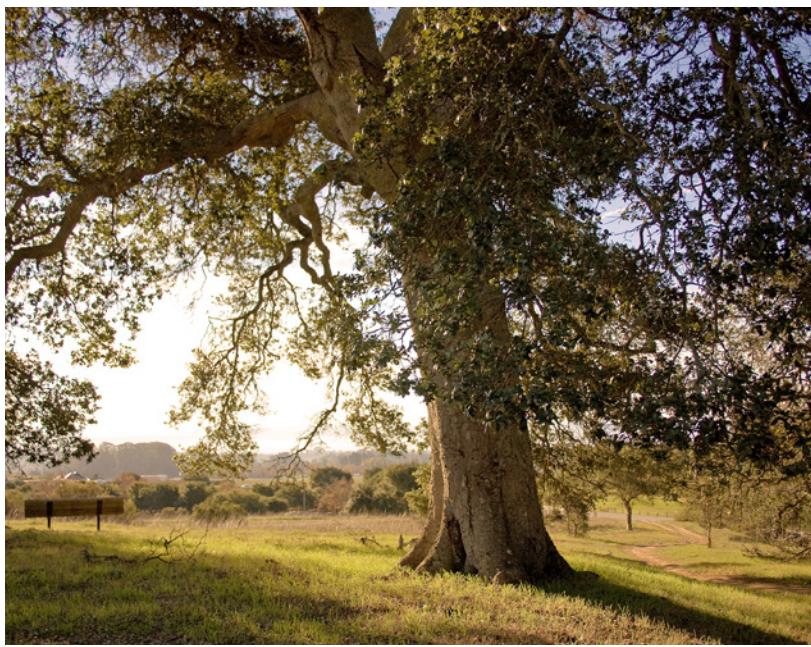
▲ San Francisco popcorn flower (*Plagiobothrys diffusus*)

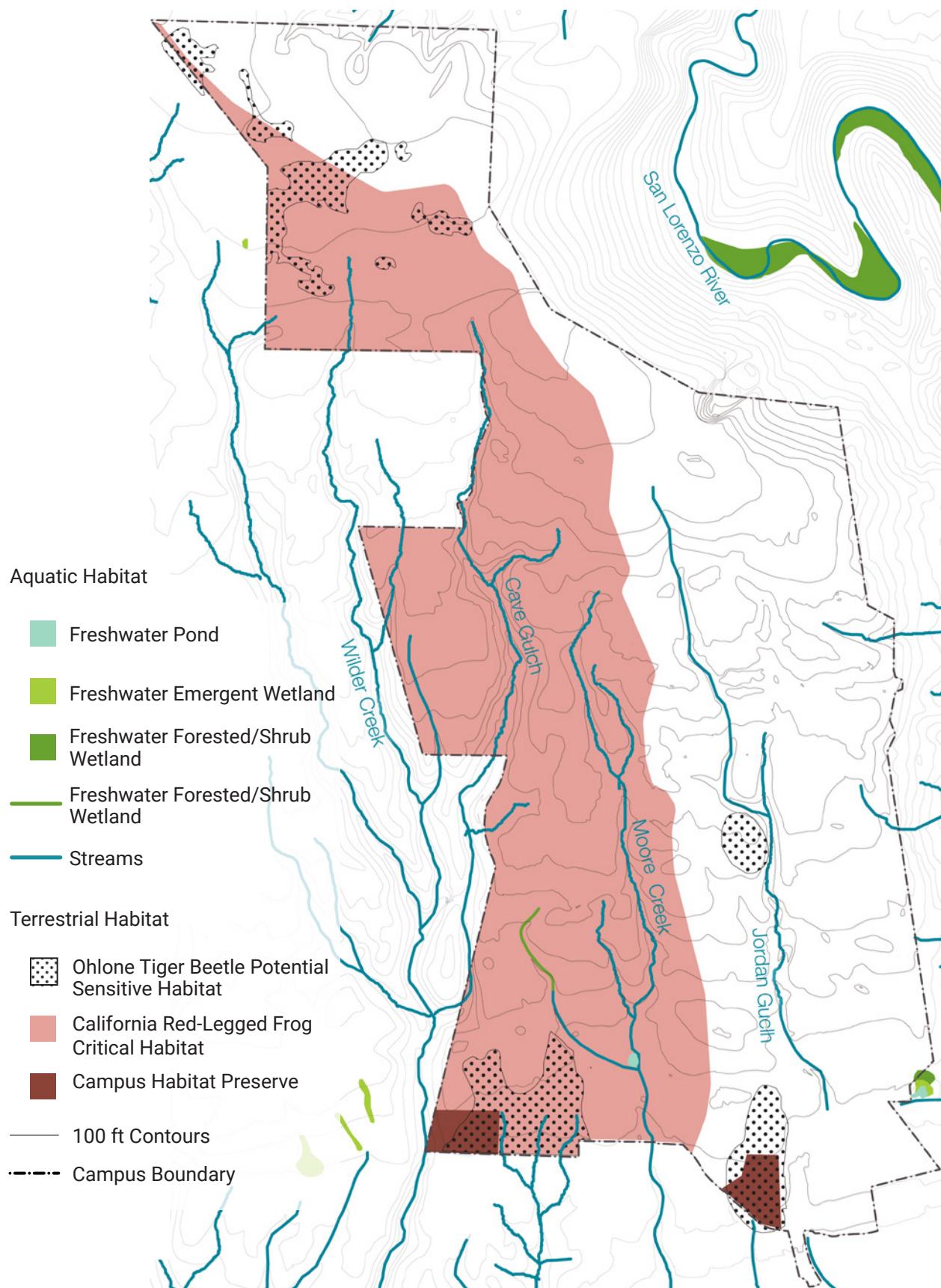
Northern maritime chaparral habitat, which includes a variety of species [wartleaf ceanothus (*Ceanothus papillosus*), blue blossom (*Ceanothus thyrsiflorus* var. *thyrsiflorus*), yerba santa (*Eriodictyon californicum*), and knobcone pine], is a dense shrubland located predominantly within north campus. Northern maritime chaparral is dominated by brittle leaf manzanita and commonly contains Santa Cruz manzanita, which is a special-status plant species.

Other abundant vegetative communities on campus include the coast live oak habitat, found within the north campus, including coast live oak (*Quercus agrifolia*) and Shreve oak (*Quercus parvula* var. *shrevei*), as well as California bay, Pacific madrone, and Douglas fir. The coastal mixed hardwood habitat, found within the north, central, and lower campus, includes a variety of tree species [coast live oak, California bay, Pacific madrone, Douglas fir, ponderosa pine (*Pinus ponderosa*), and knobcone pine], and intergrades other habitat types on the campus, particularly redwood and coast live oak habitats. Coyote brush and riparian woodland and scrub are present in less abundance, but the riparian woodland is considered a sensitive natural community present within central and lower campus and is associated with intermittent streams.

One plant listed by the State of California as endangered, San Francisco popcorn flower (*Plagiobothrys diffusus*), occurs in meadows on the north part of campus. Other special status plant species on the main residential campus include Santa Cruz manzanita, Point Reyes horkelia (*Horkelia marinensis*), and Marsh Microseris (*Microseris paludosa*). No other rare or endangered plant species listed by the state or under the federal Endangered Species Act have been found on campus.







▲ Figure 2.13 Main Residential Campus - Wildlife Habitat

1" = 2000'

Wildlife

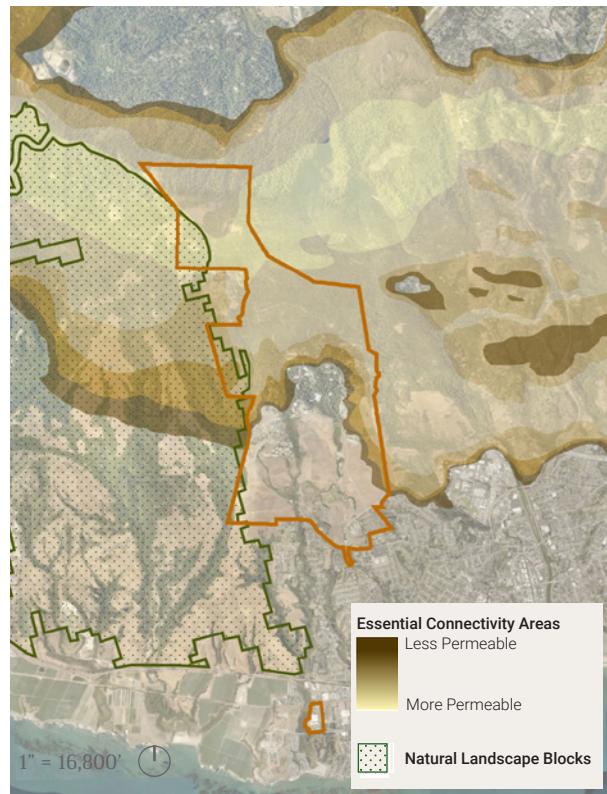
The campus supports a wide range of wildlife within distinct plant communities. The redwood forests are visited by many wildlife species. The mixed evergreen forests on campus support a range of mammals, reptiles, cave species, and birds; grasslands support rodents, rabbits, and insects, which in turn are preyed upon by birds (including raptors), bats, and terrestrial predators (including coyotes and mountain lions). The chaparral supports reptiles, small birds, and predators such as the bobcat and the gray fox.

The biologically rich campus includes two Federally listed species. The California red-legged frog (*Rana aurora draytonii*) is a federally threatened species known to occur in the southwestern portion of the campus between drainages and aquatic habitats. The Ohlone tiger beetle (*Cicindela ohlone*) is a federally endangered species that is known to occur in the lower campus and in the north campus. Ohlone tiger beetle is associated with coastal prairie habitat or other grassland habitat growing on Watsonville loam soils, where bare ground is evident and Mima mounds are usually present (Figure 2.13). Mountain lions (*Puma concolor*) may be candidates for listing, if they are within the Central Coast and Southern California Evolutionarily Significant Units (ESU) and would be protected under the California Endangered Species Act (CESA)(Arnold 2020).

Nineteen special-status wildlife species have been previously documented in the LRDP area: California giant salamander, California red-legged frog, foothill yellow-legged frog (*Rana boylii*), Santa Cruz black salamander (*Aneides niger*), southwestern pond turtle (*Actinemys pallida*), Bryant's savannah sparrow (*Passerculus sandwichensis alaudinus*), burrowing owl (*Athene cunicularia*), olive-sided flycatcher (*Contopus cooperi*), white-tailed kite (*Elanus leucurus*), Dolloff cave spider (*Meta dolloff*), Empire Cave amphipod (*Stygobromus imperialis*), Empire Cave pseudoscorpion (*Fissilicreagris imperialis*), MacKenzie's Cave amphipod (*Stygobromus mackenziei*), monarch butterfly - California

overwintering population (*Danaus plexippus pop. 1*), Santa Cruz telemid spider (*Telema sp.*), Ohlone tiger beetle, American badger (*Taxidea taxus*), mountain lion (*Puma concolor*), and San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), (CNDDB, 2020; UC Santa Cruz, 2005a; Santa Cruz Puma Project, 2020).

Wildlife species depend upon the ability to move between natural habitats. The north campus contains natural landscape blocks that have value as relatively intact natural habitat and as connections to other natural habitats surrounding the campus (Figure 2.14).



▲ Figure 2.14 Main Residential Campus - Essential Connectivity Areas



▲ Figure 2.15 Main Residential Campus - Topography

1" = 2000'

Site Conditions

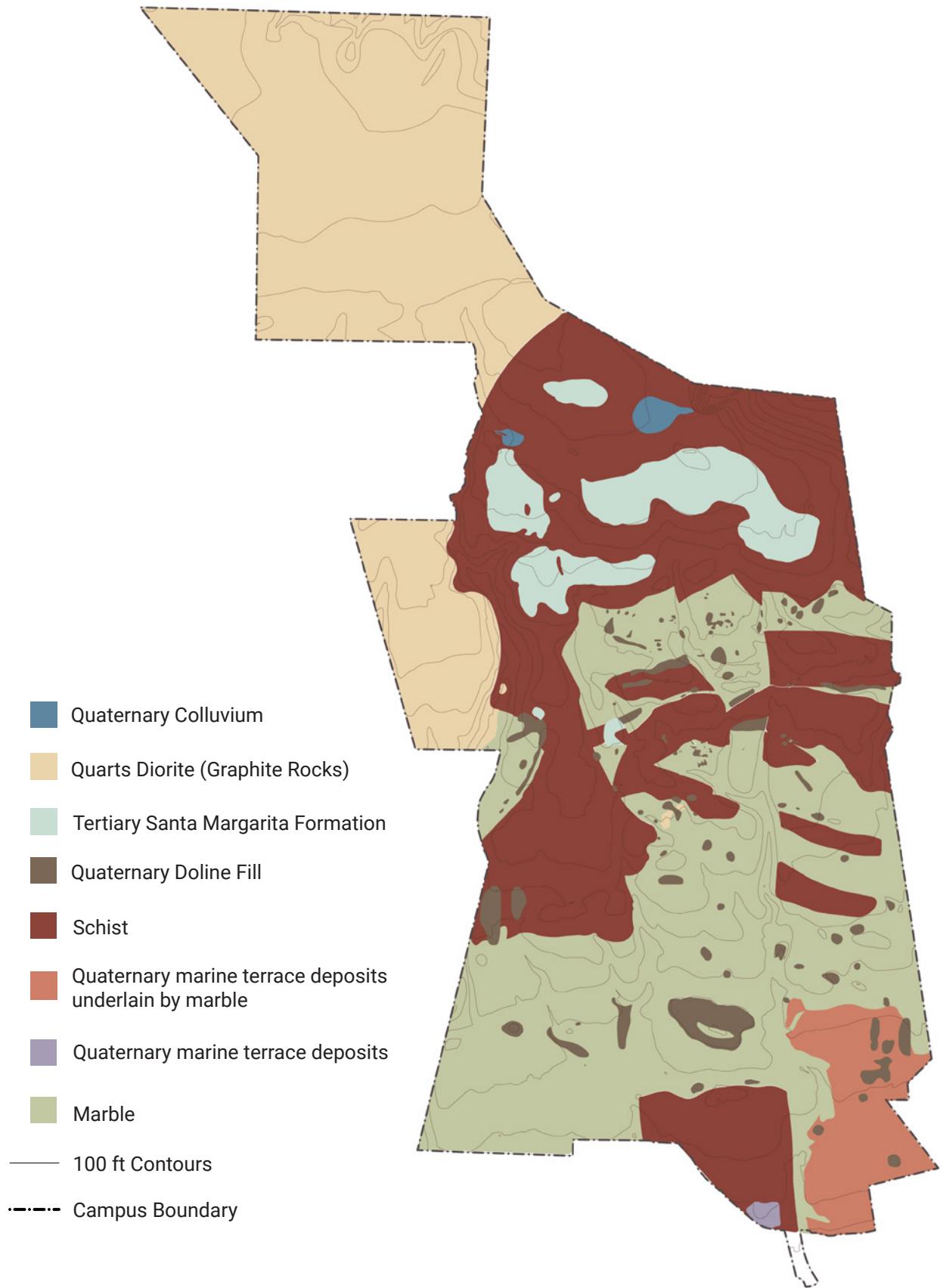
Topography

Topography is a primary factor in determining the location of both past and future campus development. The siting of buildings, plazas, and infrastructure strives to make the most of the dramatic landscape, while avoiding unnecessary challenges. Topography presents a clear structure to the campus's landscape. Elevations on the main residential campus vary from about 300 feet at the southern edge of campus, to almost 1200 feet at the northwestern boundary. Rising nearly 900 feet, the campus sits on a series of marine terraces (Figure 2.15). Relief is typically low to moderate, except along the steep east-facing escarpment on the eastern side of campus and along the sides of some campus drainages.

Several waterways running downhill from north to south have formed ravines that divide the central and lower campus into three zones. In some places the ravines, known as Moore Creek, Jordan Gulch, and Cave Gulch, are as much as 70 feet deep and 350 feet wide. The combination of the terraced land and the ravines make the campus setting unique and poses particular challenges and unique opportunities for circulation and siting of development.



▲ Elevation changes on the Main Residential Campus



▲ Figure 2.16 Main Residential Campus - Geology

1" = 2000'

Geology

UC Santa Cruz is located on the western flank of the Santa Cruz Mountains, a major ridge in the Coast Ranges Province and part of a series of coastal mountain chains paralleling the pronounced northwest-southeast structural grain of central California geology. A sequence of marine sediments and non-marine sediments overlay the granitic and metamorphic basement rocks.

The main residential campus sits at the southeast end of the crest of Ben Lomond Mountain (part of the Santa Cruz Mountains) in the county of Santa Cruz. Ben Lomond Mountain is a large granitic massif that has dropped steeply into the valley of the San Lorenzo River. The south- to southwest-facing flank of Ben Lomond Mountain is broad with a relatively gentle to moderate slope.

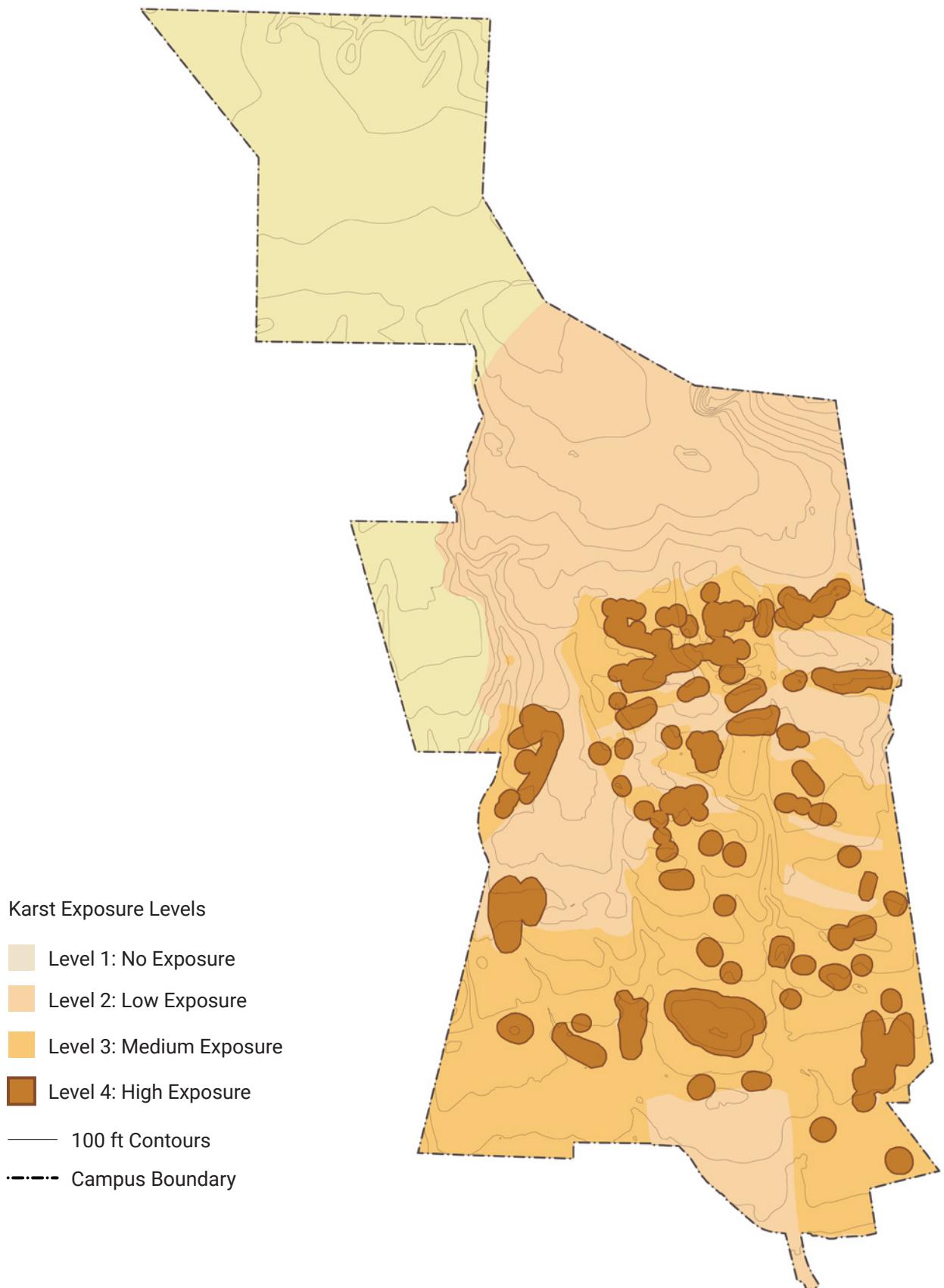
The campus is positioned on a series of step-like terraces that build from sea level in the City of Santa Cruz to an elevation of almost 2,600 feet at the summit of Ben Lomond to the northwest. The developed portion of the main residential campus lies on this gently sloping, south facing hillside.

The north half of the campus bedrock is composed of granite, while the southern half of campus, including most of the developed portion, is underlain by marble bedrock (Figure 2.16). Dissolution of the marble by percolating groundwater has dimpled the terrain with closed depressions due to sinkhole formation. Karst features, including ravines, sinkholes, and caverns, are readily apparent in the lower and central campus, having developed as a result of the dissolution of marble along fractures, joints, and faults. This condition is variable throughout the campus and is a geological feature unique to the State. The main residential campus is cut by several steep-walled, north-south flowing streams, but an integrated drainage system has not formed due to sporadic stream flow capture by sinkholes.

The structural grain of the geologic setting is controlled by faults that form the San Andreas fault system. Despite this, no evidence that these faults have been active has been found. Earthquake fault rupture and soil liquefaction are not considered campus geologic hazards. However, campus structures could be expected to undergo severe shaking during earthquakes centered on the nearby San Andreas fault.

Seismicity

The UC Santa Cruz campus lies within one of the most seismically active areas in the western United States. Seismicity on the campus has resulted in strong ground shaking during a few seismic events over the last century and could occur again due to its location in a seismically active region. However, the campus is not located within an Alquist-Priolo active fault zone making surface ruptures along faults unlikely. Geologists and other design professionals regularly collaborate to ensure construction issues relative to seismicity are addressed.



▲ Figure 2.17 Main Residential Campus - Karst Exposure

1" = 2000'

Karst

The karst geology on the main residential campus is created by water soluble rocks subject to dissolution over hundreds of thousands of years. The ground is characterized by an irregular surface resulting from subsidence of the bedrock and deposition of sediment into subterranean cavities within the marble bedrock (Figure 2.17).

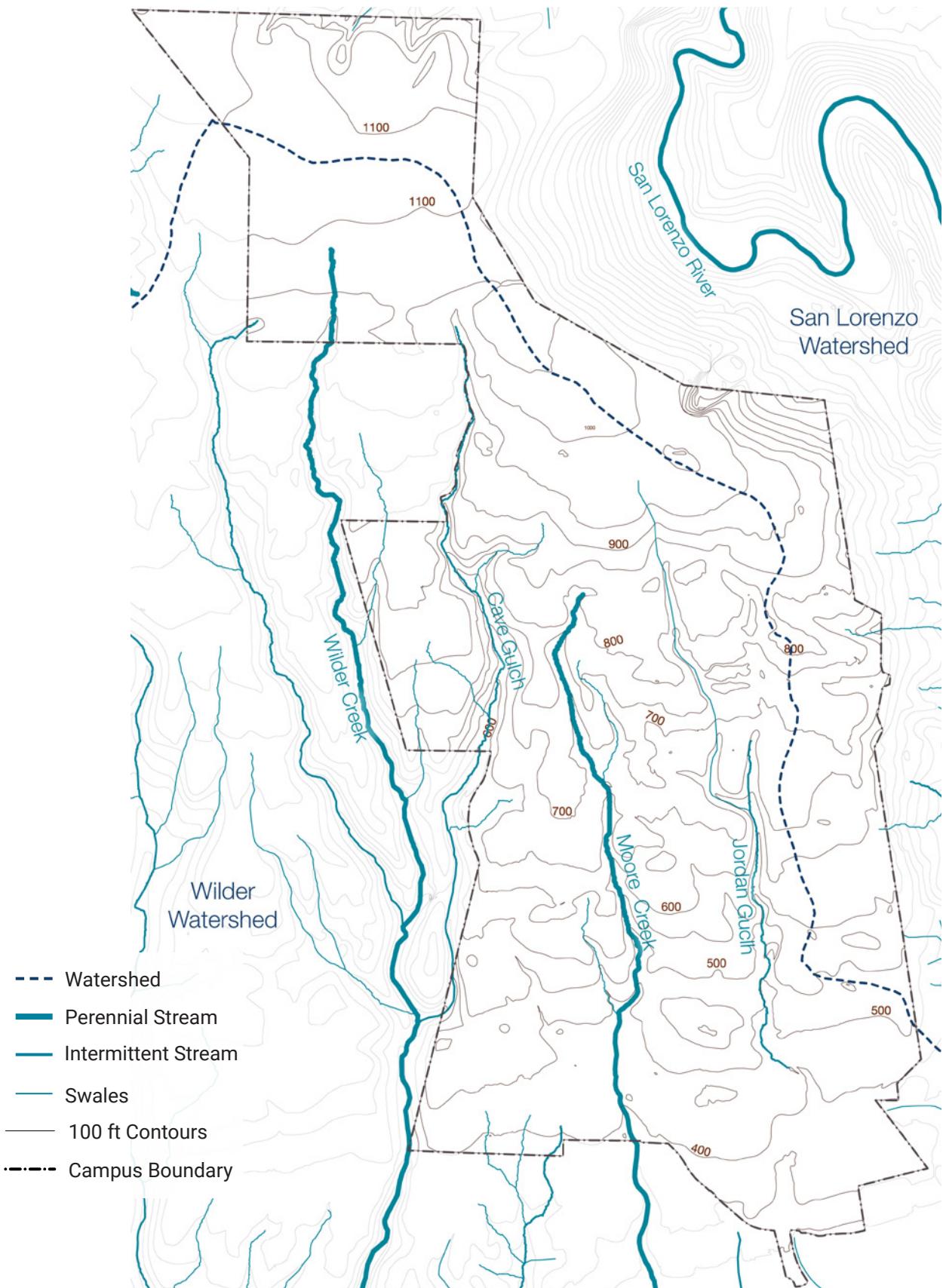
Depressions in the land surface resulting from this underground solubility are called sinkholes or dolines. The karst topography on the main residential campus is formed by solution dolines which are formed by gradual settling of surficial sediments into a solution cavity while dissolution is occurring. These dolines are characterized by gently sloping sides and an absence of rock outcrops along the walls. This weathering processes associated with marble bedrock creates special problems for the siting and foundations of buildings which requires detailed investigation of building sites and careful foundation design.

Soils

A large variety of soil types with variable composition, texture and thicknesses exist on the campus. Since soil is derived from the underlying bedrock, soil composition and distribution are predominantly controlled by bedrock composition and distribution. Limitations due to soils, including expansiveness, erosion potential or other properties, requires site specific investigations with robust subsurface work by geologists, geotechnical engineers, and civil engineers for development and related activities.

The predominant soil types on the upper/north portion of the main residential campus are Watsonville loam, Lompico-Felton complex, and Aptos loam. The predominant soil type in the central campus is the Nisene-Aptos complex and the distributed soil types in the lower campus are predominantly Elkhorn sandy loam, Los Osos loam, Ben Lomond-Felton complex, and Watsonville loam.

The erosion potential for the majority of soil types on the campus ranges from slight to moderate with large portions of the north campus also containing similar erosion potential. Significant pockets of soils with a high to very high erosion potential are present in the upper, central, and lower areas of the main residential campus.



▲ Figure 2.18 Main Residential Campus - Waterways

1" = 2000'

Hydrology

Rainfall levels vary considerably with elevation on the campus. While 30 inches of rain falls on the lower campus, closer to 40-45 inches or more falls on the upper campus.

In general, rainfall on the northern third of the main residential campus drains by surface flows that are dispersed. The geology of the area supports percolation of water in springs and seeps. On the southern two thirds of the campus, karst topography has developed as a result of the dissolution of marble creating a distinctly different drainage pattern. Water flows into the steep natural north-south flowing stream channels (Figure 2.18). These channels lack an integrated drainage system due to sporadic stream capture by sinkholes and swallow holes. (i.e., the location in karst limestone at which surface water is channeled to the subsurface). From there, most stormwater on campus drains into the karst aquifer as groundwater, flowing through a complex system of caves and solution channels (i.e., fractures through which water may flow). Some stormwater runoff reappears at the surface as springs at lower elevations to the east, south, and west of the main residential campus (Johnson, 1989).

Due to the unique subsurface drainage system, surface runoff on much of the central and lower campus is significantly less than runoff on other nearby lands; however, sedimentation of sinkholes that are at or near capacity have the potential to overflow with a rapid discharge to downstream channels.

Erosion and Flooding

The potential for erosion by storm water runoff is generally high on the central and north campus due to the steep gradients and the presence of fractured rocks and susceptible soils. The potential for erosion on the central and lower campus has been exacerbated by the addition of impervious surfaces as the central campus has developed over the years.

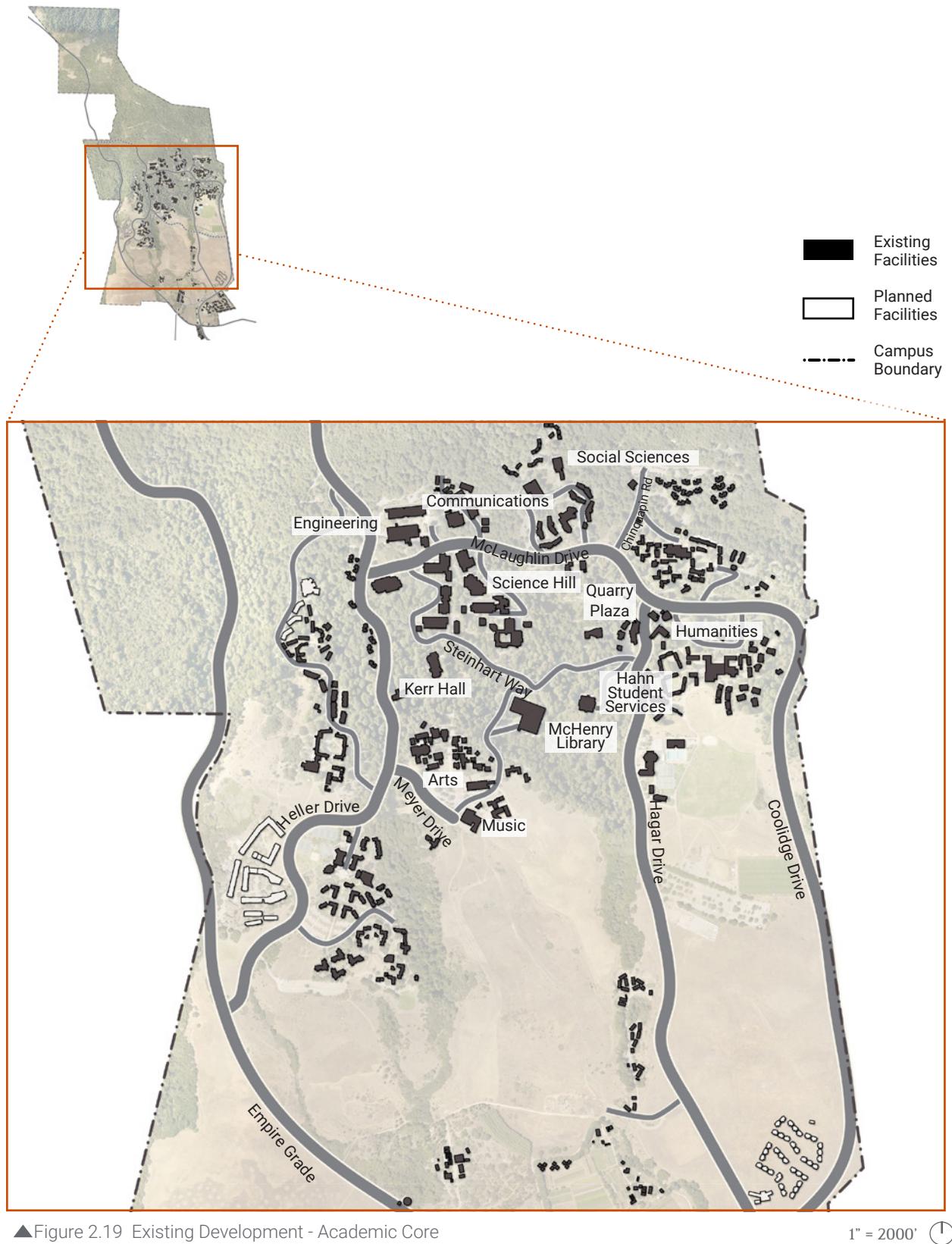
Newer development areas have incorporated stormwater management practices to help control sedimentation, including detention basins, underground detention vaults and bioretention areas to reduce flow rates and discharge the runoff into the nearest drainage channel. However, some older development areas still discharge to drainage channels without detention and these will continue to be updated with current strategies to limit impervious surfaces and control surface water flow rates to address erosion.

In general, flooding is not a problem on campus since the stormwater enters the subsurface through a series of sinkholes and the campus sits well above the 100-year flood zone. However, a few sinkholes on the campus have been observed to have a build-up of sediment which limits their capacity to infiltrate runoff and results in periodic flooding. Three sinkholes overflowed during storms in 2004, and efforts have been made to divert runoff from these critical sinkholes to mitigate sedimentation and overflow. Sinkholes with build-up of sediment are likely to continue to pose localized areas of concern.

Groundwater Supplies

UC Santa Cruz is within both the West Santa Cruz Terrace Basin that sits to the east and immediately to the south of the main residential campus and the Santa Margarita Basin situated approximately 2.5 miles north of the main residential campus. The two hydrogeologic systems on the campus that feed the distinct groundwater basins are directly related to campus geology with a uniform shallow groundwater system in the north and a karst aquifer system in the central and lower parts of campus.

UC Santa Cruz receives water from the City for domestic and irrigation purposes and therefore does not currently extract groundwater for use on campus. However, the karst aquifer system in the central/lower part of the campus holds potential for groundwater extraction and supply, since a substantial portion (about 40 percent) of precipitation runoff enters the system.



▲Figure 2.19 Existing Development - Academic Core

Buildings and Facilities

The UCSC main residential campus developed over the last five-plus decades guided by its series of Long Range Development Plans. The driving concept for the campus has been simple up to this point: a relatively compact academic core, accommodating the majority of teaching and research facilities, surrounded by a ring of student housing, primarily in the form of residential colleges that would provide students a place for learning and socializing.

Today, the campus includes 3.75 million assignable square feet (ASF) of buildings that support its mission. Academic and residential facilities, which constitute most of the developed space, occupy approximately 450 acres or about 22 percent of the total campus acreage.

Academic Core

The academic core lies at the center of development on the campus. Bounded on the east by Hagar Drive and on the west by Heller Drive, it has evolved to include several distinct districts that reflect the general academic focus areas or discipline groups. The proximity of these various districts in this compact, walkable core allows for convenient interdisciplinary contact and engagement, a factor that has contributed to UCSC's flourishing academic teaching and research endeavors (Figure 2.19).

Science Hill

This was the first area of the academic core to develop; several buildings date from the campus opening in 1965. A contiguous area lying just below McLaughlin Drive and above Steinhart Way, Science Hill predominantly comprises the physical and biological sciences and engineering, as well as the Science and Engineering Library.

Engineering

In the early days of the campus, the central plant and Communications Building were located north of McLaughlin Drive, joined in later years by Baskin Engineering and Baskin Auditorium. Now the area includes Engineering II, reflecting the rapid growth of various engineering disciplines. Astronomy shops, central plant facilities, and storage uses are also located here in small buildings.

Arts

Lying just east of Heller Drive and south of McHenry Library, the arts area has grown to include performance theaters and halls, practice rooms, classrooms, and offices, as well as fine arts studios for painting, sculpture, and the Digital Arts Research Center building.

McHenry Library and Administration

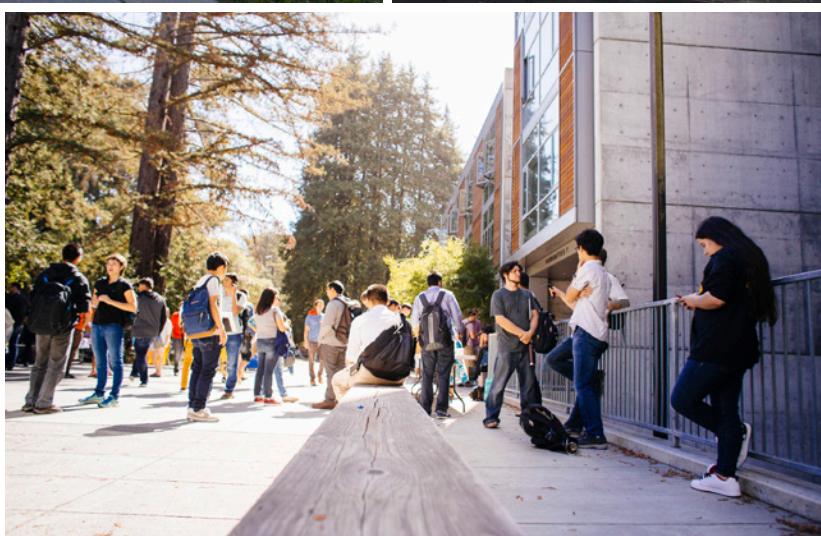
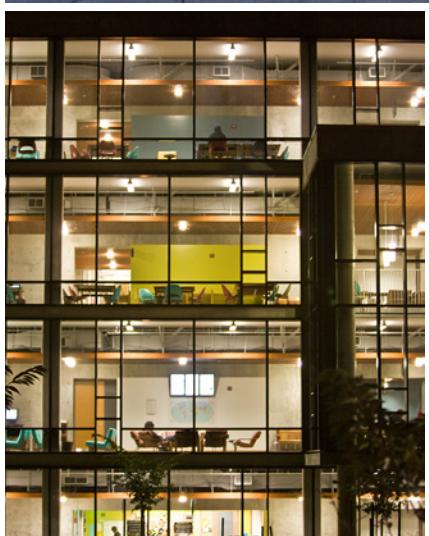
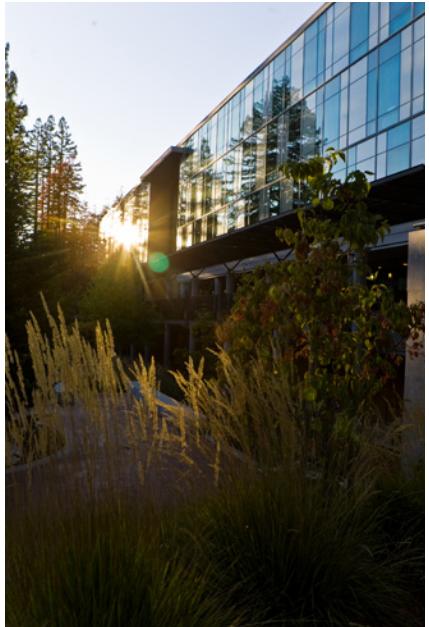
Administrative functions are focused in Kerr Hall, which at one time housed the social sciences as well as offices supporting College Six, which became Kresge College. McHenry Library, one of the original campus buildings, has been expanded and its collections and functions have evolved with the ongoing growth of available online and digital resources. Hahn Student Services is located east of the Library, accessed via Steinhart Way near Hagar Drive.

Humanities and Social Sciences

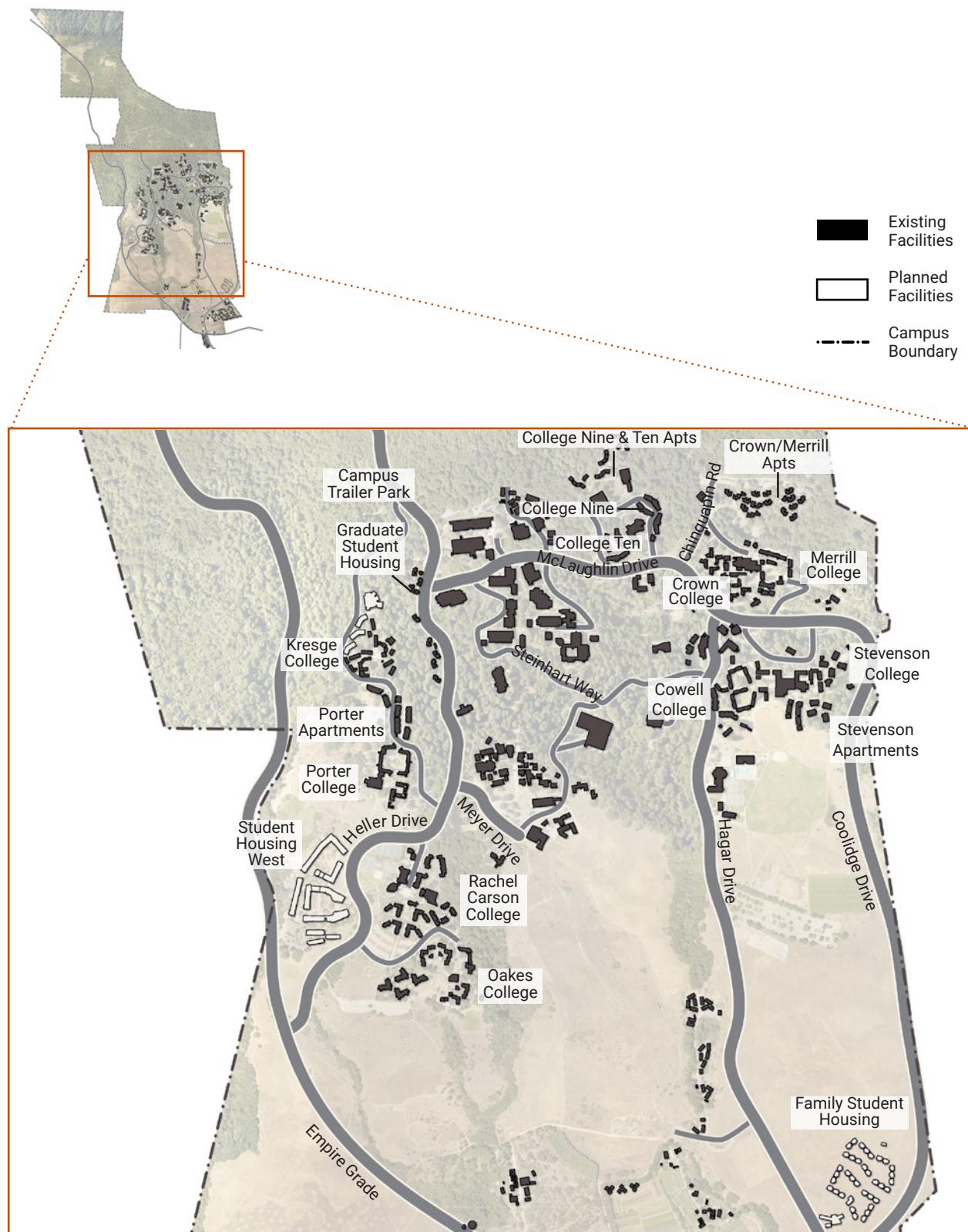
Today, a small humanities district of three buildings is located at the northwest corner of Cowell College at the southeast corner of Hagar and McLaughlin Drives. The social sciences have classrooms and offices in two buildings in the midst of Colleges Nine and Ten.

Student Center

Just west of Hagar Drive and Cowell College are various student-oriented facilities. These include the Student Union, Graduate Commons, and Bay Tree Bookstore. Classroom Unit I adjoins these facilities just to the west and the Quarry Amphitheater lies just north.







▲Figure 2.20 Existing and Planned Development - Student Housing

Student Housing

Since 1963, the campus has grown from the first two undergraduate colleges, Henry Cowell and Adlai Stevenson, to a full complement today of 10 colleges. These colleges surround the academic core, and most are within a 10-minute walk of the majority of academic destinations. The colleges fall into two zones. On the east side, the earliest college pairs include Cowell and Stevenson, and Crown and Merrill, with Colleges 9 and 10 added in 2002. On the west side, were added, in order of development: Porter (1969), Kresge (1971), Oakes (1972) and Rachel Carson (1990). Throughout the history of the campus and the corresponding LRDPs, it has been assumed that additional colleges would be added over time, most often shown in areas to the north of the east and west zones (Figure 2.20).

The original vision for UCSC was focused in part on the idea of residential colleges that would support not only living accommodations, dining and other student services, but that would also be centers of learning, with classrooms and faculty offices. While significant consolidation of some of these uses, particularly in the sciences and engineering, have occurred over time in the academic core allowing proximity to labs and equipment. The colleges nonetheless remain venues for offices, classes, symposia, and other academic pursuits.

A small complex of graduate student housing is located along Heller Drive just west of Science Hill. UCSC has also added several housing projects though not formally affiliated with a college: The Crown-Merrill Housing, Stevenson Infill Apartments, Porter Infill Apartments, and Kresge Infill Apartments.

Two housing projects are planned but not yet approved: Student Housing West (SHW) and the related Family Student Housing project. The SHW project proposes to accommodate both undergraduate and graduate students on two sites; the first is on Heller Drive which includes housing for approximately 2,900 undergraduate and graduate students and the second is on Hagar Drive which includes housing for 140 student families and a childcare facility.

The Kresge College Renewal Project is currently underway and expected to be complete in Fall 2023. The first phase includes approximately 400 student beds in three new residential buildings and a new academic center with lecture halls, classrooms and department space. The second phase renews portions of the existing college complex, renovating existing housing and providing student support programs. Significant site improvements to provide accessibility to and throughout the college are also included. Designed with consideration of the architectural legacy of the complex, these improvements were made critical by the deteriorating condition of the original buildings and evolving space needs.





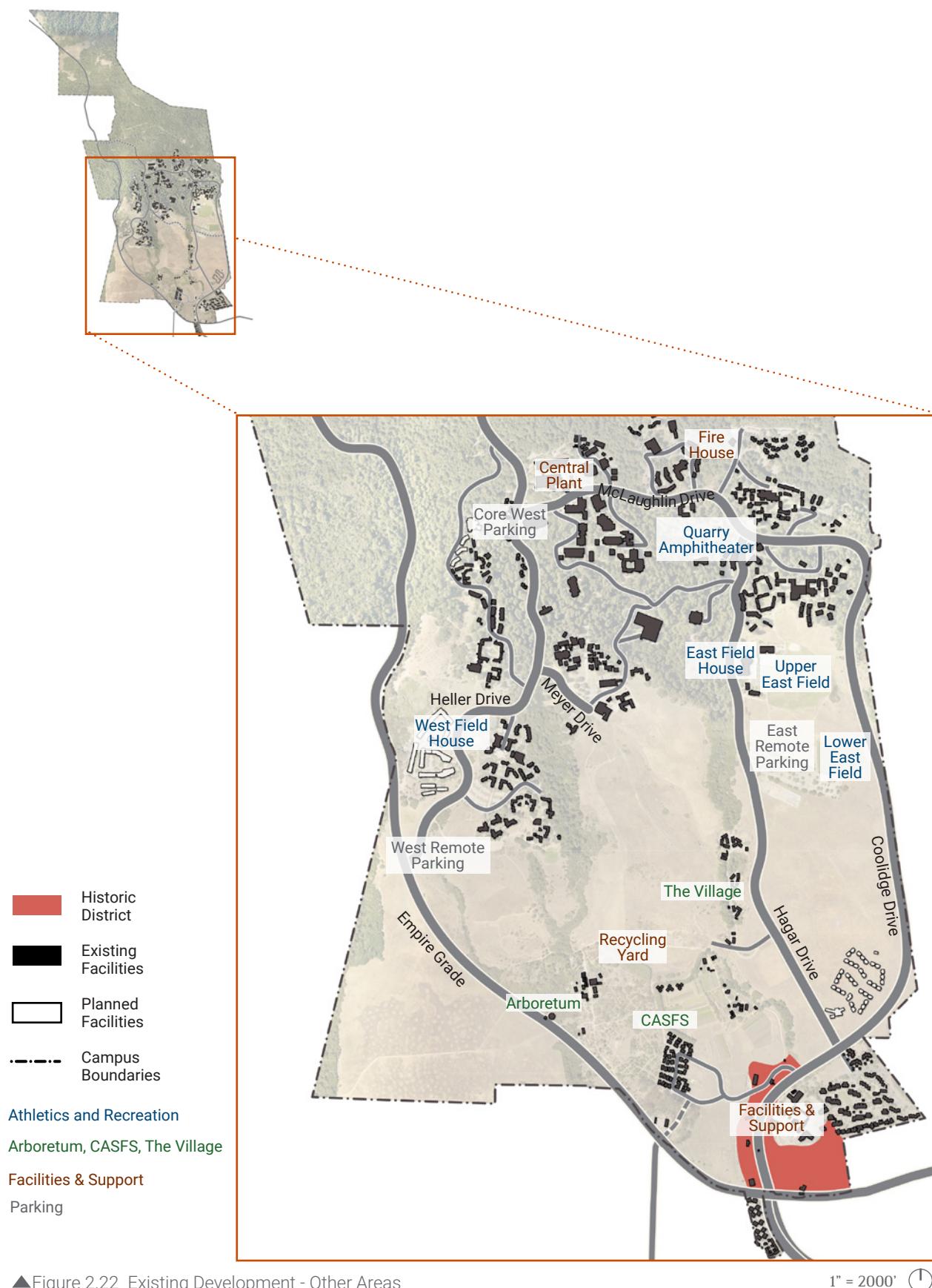
Employee Housing

Employee housing has been provided on the campus since its earliest days. A chancellor's residence and homes for the college provosts were embedded in the colleges. In the 1980's and 90's, employee housing was provided near the campus entry in the Cardiff Terrace, Hagar Court and Hagar Meadows communities. More recently, Ranch View Terrace, a complex of 45 small lot homes, was built on a site north of the Arboretum. Ranch View Terrace II has been planned for 39 additional units and an EIR has been certified under CEQA for a site adjoining the first phase. A schedule for design and construction of this project has not been identified. In total, the campus currently provides 239 homes for employees.



▲Figure 2.21 Existing Development - Employee Housing





▲Figure 2.22 Existing Development - Other Areas

Athletics and Recreation

Athletics and recreation buildings and fields are primarily located below and south of Cowell and Stevenson Colleges, with a West Field House located within the Rachel Carson College footprint. The East Field House Complex includes the Wellness Center, East Gym, Martial Arts Room, Dance Studio, Activity Room, Racquetball Courts, a Multi-purpose Room, Tennis Courts, and Pool. The area includes the Upper East Field and the Lower Field. The West Field House includes space for a variety of sports including basketball, volleyball and dance. Six tennis courts are also located within the Rachel Carson College area.

Arboretum and Botanical Garden, CASFS and the Village

The Arboretum and Botanical Garden occupies approximately 135 acres and includes display gardens with a wide range of native and nonnative plant collections, as well as greenhouses, offices and meeting rooms, and visitor information center.

The Center for Agroecology and Sustainable Food Systems (CASFS) is located on about 30 acres to the west of Hagar Drive. It includes extensive farm fields and minor supporting structures that are used in the many educational and agricultural projects undertaken by the Center. An undergrad agroecology major was added in academic year 2020-21, providing additional classes and research opportunities. Adjacent to CASFS along Jordan Gulch is the Village, which houses The Program in Community and Agroecology (PICA), an educational and residential program focused on experiential learning, sustainability and food systems. Housing for approximately 153 continuing undergraduate students is provided in an assortment of modular structures.

Facilities and Support

Several essential support facilities, including the campus central plant and the fire house, are located north of McLaughlin Drive, the former across from Baskin Engineering, and the latter at the current terminus of Chinquapin Road. Additional staff and storage trailers along with and smaller maintenance areas adjoin the central plant.

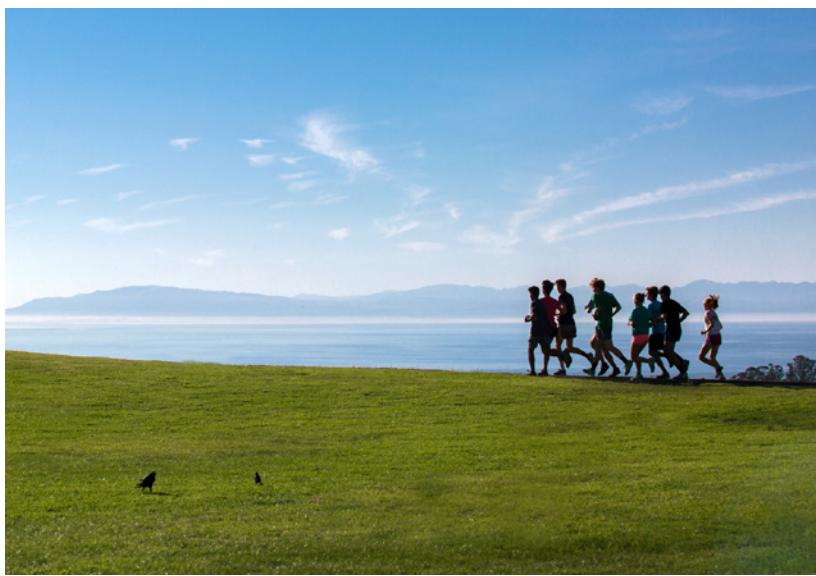
A large flat site above the Historic District has evolved over the years to accommodate structures and yards for campus support services, such as vehicle maintenance, storage and offices. The site was related to the operations of the Cowell Lime Works and later the Cowell Ranch, and includes one structure that contributes to the Historic District (Cardiff House) and several others that were working barns (Barns G and H). The site has had significant alterations from its original use and condition. The campus Emergency Response Center and police station are in the area in a newer facility.

While convenient for deliveries and some staging and support activities, this is a large relatively flat site that could accommodate other uses that would benefit from easy access to westside destinations and community.

A recycling yard and support space are located just north of the farm and fields of CASFS. The area is 9 acres and is accessed from Hagar Drive (Figure 2.22).

Parking

Parking at UCSC is primarily accommodated in surface lots. Large surface parking lots are located on the east and west sides to the south of the core campus and colleges. The one parking structure is located at the northwest edge of the academic core at the intersection of Heller and McLaughlin Drives. Additional lots of varying sizes are scattered throughout campus accommodating visitors, faculty and staff, and service vehicles. Several larger lots, located in the Academic Core or nearby, offer opportunities for the infill of academic or administrative buildings, or for additional parking structures.





Historic District

At the southern edge of the campus, the Cowell Lime Works Historic District serves as the primary gateway to the campus. As described earlier, the Historic District is on the National Register of Historic Places and the California Register of Historical Resources, and noted for its role in the Santa Cruz region and economy in the 19th century. Today the Cook House and Hay Barn are in active use, the Cook House for administrative purposes, and the Hay Barn for special events and office space for CASFS. The Barn Theater is currently not in use. A number of structures in the district are in poor shape and the overall character of the district has evolved somewhat at odds with its historic past with surface parking and landscape that are not consistent with the district's historic eras. A management plan for the district is in the process of being updated and additional studies are likely in the near term to identify opportunities to further improve the district for use as a campus and community amenity.



▲ Historic Photo - Lime Kilns



▲ Historic Photo - Worker Housing



▲ Street Level View



▲ Renovated Hay Barn

2.3 UCSC Westside Research Park

With UCSC's acquisition in 2004 of the former Texas Instruments industrial facilities at 2300 Delaware Avenue, the newly named Westside Research Park is becoming an anchor for this evolving mixed-use district at the western edge of the city. In addition to the long-standing light industrial uses that characterized the area, new biotech and other research entities and start-ups, as well as housing and retail uses are energizing the west side of Santa Cruz.

Site Conditions

The 18 acre site lies about one-fourth mile east of the Coastal Science Campus and just north of Natural Bridges State Park. It is adjoined by a variety of vacant sites, light industrial uses and new mixed use developments. The Westside Research Park site is adjacent to a former freight rail corridor that is now managed by the Santa Cruz County Regional Transportation Commission (RTC). Planning is underway to bring regional commuter rail through the area, connecting Watsonville to Davenport, with a planned station in the vicinity of Western and Natural Bridges Drives. A paved multi-use path is planned to be co-located in the regional rail-trail corridor, with a trail segment recently constructed from California and Bay Avenues west to Natural Bridges Drive, at the doorstep of Westside Research Park.

Elevation on the Westside Research Park is approximately 60 feet above mean sea level. The site is generally flat with the exception of a 3-foot rise from Delaware Avenue on the southern perimeter of the site rising to approximately 5 feet on the northern boundaries of the site.



▲ Figure 2.23 Westside Research Park - Context

While some flooding could occur at the Westside Research Park, it would be minimal, and the existing conveyance systems and position of the majority of the site lies out of the 100-year flood zone (a small and relatively insignificant area along the southwestern property that slopes towards Antonelli Pond is within a 100-year flood zone).

The Westside Research Park captures a portion of the site's stormwater runoff through a network of drain inlets and conveys it into the City of Santa Cruz storm sewer system. Another portion of the site's stormwater runoff is conveyed into the neighboring Antonelli Pond. Surface water percolation on the site is not possible due to the shallow groundwater conditions, making conveyance into the city system and Antonelli pond necessary.

The existing site conditions and access to UCSC main residential campus via Western Drive establish an interesting and evolving context for this campus district, together with proximity to UCSC's Coastal Science Campus, west side Santa Cruz redevelopment trends, and planned regional transportation investments.

Facilities

Westside Research Park includes three buildings totaling 126,000 square feet and an additional 62,000 square feet of mechanical yards. The site also includes parking lots, tennis courts, and outdoor storage (Figure 2.24). Approximately half of the site remains open and gently slopes down toward Antonelli Pond. The facilities on site are currently used by UCSC for academic and administrative purposes. UCSC's property tenants currently include researchers from the Baskin School of Engineering, the Division of Physical and Biological Sciences, the Genomics Institute, and a variety of other research-based programs as well as administrative users.



▲ Figure 2.24 Westside Research Park - Site

1" = 350'



▲ 2300 Delaware Lobby