CLIMATE ACTION & ADAPTATION PLAN

DECEMBER 2025

UCR Land Acknowledgment

We at University of California, Riverside (UCR) would like to respectfully acknowledge and recognize our responsibility to the original and current caretakers of this land, water, and air: the Cahuilla [ka-wee-ahh], Tongva [tong-va], Luiseño [loo-say-ngo], and Serrano [se-ran-oh] peoples and all of their ancestors and descendants, past, present, and future. Today this meeting place is home to many Indigenous peoples from all over the world, including UCR faculty, students, and staff, and we are grateful to have the opportunity to live and work on these homelands.

Core Advisory Team

The University of California Office of the President, University of California, Riverside, and AECOM would like to thank the following participants for their engagement in the development of this Climate Action and Adaptation Plan:

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Glossary

AASHE	Association for the Advancement of Sustainability in Higher Education
ACCII	Advanced Clean Cars II
BAU	Business-As-Usual
BIPOC	Black, Indigenous, and People of Color
CAAP	Climate Action and Adaptation Plan
CAP	Climate Action Plan
CARB	California Air Resources Board
CE-CERT	Center for Environmental Research and Technology
CEQA	California Environmental Quality Act
CO_2	Carbon Dioxide
CUP	Central Utility Plant
EH&S	Environmental Health and Safety
EJCJ Framework	Framework for Incorporating Environmental Justice & Climate Justice into Climate Action (University of California)
EMFAC	Emission Factor Tool (California Air Resources Board)
EPA	U.S. Environmental Protection Agency
EUI	Energy Use Intensity
EV	Electric Vehicle
GCAP	Green Campus Action Plan
GFI	Global Food Initiative
GHG	Greenhouse Gas
GWP	Global Warming Potential
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
IPCC	Intergovernmental Panel on Climate Change
IR	Institutional Research
IRP	Integrated Resource Plan
ISC3	Inland Southern California Climate Collaborative
LED	Light-Emitting Diode
LEED	Leadership in Energy and Environmental Design
LRDP	Long Range Development Plan
$MTCO_2e$	Metric Tons of Carbon Dioxide Equivalent
PPA	Power Purchase Agreement
RPU	Riverside Public Utilities
RTA	Riverside Transit Agency
STARS	Sustainability Tracking Assessment and Rating System
TCR	The Climate Registry
UC Policy	University of California Sustainable Practices Policy
UCOP	University of California Office of the President
UCR	University of California, Riverside

CONTENTS


UCR

LETTER FROM THE CHANCELLOR

Dear Campus Community,

In 2024, UC Riverside began its Campus Decarbonization Study, outlining a clear path forward to create the Climate Action & Adaptation Plan (CAAP). Our assessment of campus operations shows that most of our greenhouse gas emissions come from energy use, while climate hazards such as extreme heat, drought, and wildfire smoke pose increasing risks. These realities call for decisive action to reduce emissions, strengthen resilience, and protect the wellbeing of our community.

The CAAP's core actions were identified through a collaboration across members of the Sustainability Committee, the Office of Sustainability, the students, faculty and staff who comprise the campus community. Input was gathered from the CAAP Launch Event, three Climate Action Development workshops, and two campus-wide draft reviews. Feedback generated from these engagements elicited the 15 key actions. Through the Action Prioritization Exercise, five actions were identified along with plans to implement over the next three years. These priorities include: i) developing all-electric building guidelines for new construction; (ii) advancing compost infrastructure; (iii) expanding the R'Garden program; (iv) improving energy monitoring systems; and (v) evaluating micromobility infrastructure for potential improvements. The plan also prioritizes climate action education and research, while centering equity to ensure that climate initiatives benefit communities most affected by environmental and social vulnerabilities.

Investing in these strategies is not only about meeting state and UC climate goals but also about creating long-term value for the university. Climate action will reduce costs, protect critical assets, open new funding opportunities, and make UC Riverside an even stronger destination for students, faculty, and staff who want to lead in sustainability and climate action.

At UC Riverside, we are committed to confronting the climate crisis with urgency and purpose. Guided by our Bold Hearts and Brilliant Minds, I invite the entire campus community to join in this collective effort. By collaborating across disciplines, roles, and partnerships, we can transform this plan into meaningful, lasting change. Together, let us lead with innovation, responsibility, and determination to create a healthier, more resilient future for UC Riverside and beyond.

Sincerely,

S. Jack Hu, PhD
Chancellor

EXECUTIVE SUMMARY

Background

Climate change refers to long-term shifts in temperatures and weather patterns, primarily caused by human activities such as burning fossil fuels which produce greenhouse gas (GHG) emissions. These changes disrupt ecosystems, intensify extreme weather events, and pose serious risks to global health, food security, and economies. To avoid the most severe consequences of climate change, global GHG emissions must be rapidly reduced. The University of California, Riverside (UCR) Climate Action and Adaptation Plan (CAAP) is the university's roadmap to reducing GHG emissions, increasing climate resilience, and integrating climate justice and equity into campus operations and planning while also delivering financial, reputational, and educational benefits. This CAAP was developed in compliance with the University of California Office of the President (UCOP) UC Sustainable Practices Policy (UC Policy) requirement that each campus develop a climate action plan to achieve GHG emissions reduction goals and evaluate a broad range of climate solutions.[1] The CAAP is also aligned with key California legislation, including Senate Bill 32, which mandates a 40% reduction in statewide GHG emissions by 2030, and Assembly Bill 1279, which establishes a goal of achieving carbon neutrality by 2045 (see Climate Action Alignment section for more information).

UCR has a deep history of climate-friendly policies and practices that align with University of California, regional, and statewide goals, which are reflected through the efforts of the Office of Sustainability and student and faculty groups. UCR advanced these initiatives throughout the development of the CAAP, incorporating robust stakeholder engagement and outreach efforts. These included public events, interactive workshops, and comprehensive surveys to ensure inclusive and informed participation. Investing in the CAAP is a strategic decision that addresses the campus's climate impact, delivers co-benefits such as improved public health and equity, strengthens financial resilience by reducing costs and mitigating risks, and helps minimize future regulatory burdens.

[1] University of California. 2024. Policy on Sustainable Practices. https://policy.ucop.edu/doc/3100155/SustainablePractices

Table 1 UCR Emissions Sources

Scope	Included in UCR GHG Inventory
Scope 1	Direct emissions from building and facility fuel use (e.g., natural gas and stationary diesel), campus fleet fuel use, and refrigerant leakage.
Scope 2	Indirect emissions occurring offsite due to onsite electricity use.
Scope 3	Other indirect emissions that are a consequence of UCR activities, but occur from sources not owned or controlled by UCR, including employee commuting, UCR-funded air travel, and disposal and treatment of solid waste.

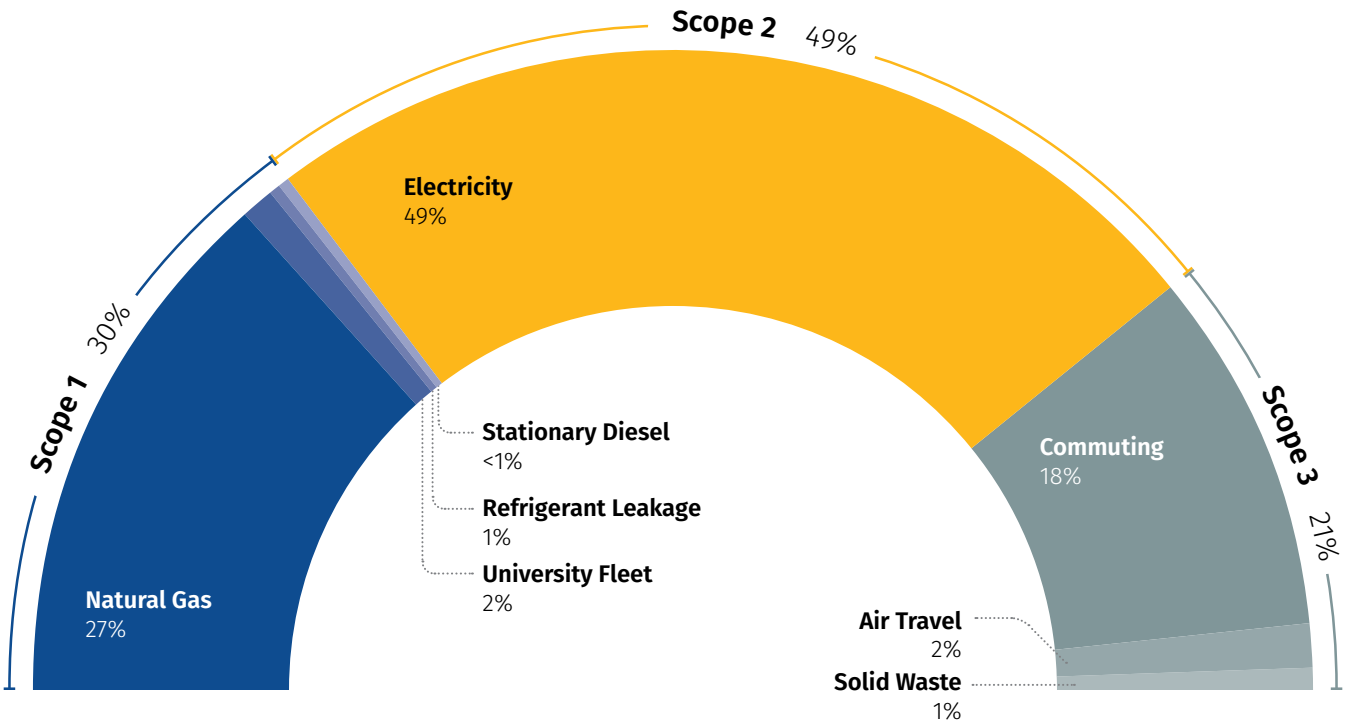
By analyzing emissions and climate data and identifying priority actions, the CAAP marks a foundational step in UCR's climate movement, empowering faculty, staff, and students to develop action implementation roadmaps, establish partnerships, pursue funding opportunities, and make informed decisions. As climate action planning is an iterative process, the CAAP is a living document that is meant to reflect the current physical, political, and financial climate impacting the campus.

GHG Emissions Analysis and Climate Vulnerability Assessment

As a first step, UCR assessed its GHG emissions and primary climate hazards to identify priority action areas. The majority of campus GHG emissions are associated with electricity and natural gas use (~76% of total emissions). Primary climate hazards include extreme heat, wildfires and smoke, extreme precipitation, and drought. As described in **Table 1**, UCR's GHG inventory is organized into three emissions scopes: Scope 1, Scope 2, and Scope 3. **Figure 1** shows UCR's 2019 GHG inventory results by Scope and emission source.

As a next step, UCR forecast emissions under a scenario that considers how emissions levels may change in the future if CAAP actions are not implemented. UCR's GHG emissions forecasts show that emissions could decrease 92% by 2045 compared to 2019 levels if: 1) the campus electrifies the Central Utility Plant (CUP) as outlined in the 2024 Campus Decarbonization Study; 2) Riverside Public Utilities (RPU) continues to increase its clean electricity sources as outlined in the RPU Integrated Resource Plan; and, 3) State of California zero-emission vehicle regulations are enacted (i.e., Advanced Clean Cars II is fully implemented). If CUP electrification does not occur, emissions would only decrease 45% from 2019-2045.

Figure 1 **UCR 2019 GHG Inventory**



UCR then established GHG reduction targets to align with UC Policy guidance (see **Table 2**).

Because the GHG forecasts show aggressive decarbonization through 2045, UCR's emissions trajectory could meet the 2045 total emissions reduction target of 90% (see **Figure 2**). However, if CUP electrification does not occur, UCR would most likely not meet the targets without further climate action.

Meeting the 2045 target is highly dependent on UCR obtaining funding to electrify the CUP, as well as other external factors, such as state legislation. Additionally, UCR's current emissions trajectory shows that the campus will not meet the 2030 and 2035 Scope 1 targets. Therefore, additional climate actions are still necessary to reach the interim targets, provide more certainty on meeting the overall emissions targets, and produce additional benefits to the campus and surrounding community, such as cleaner air and lower transportation costs.

Table 2 **UCR GHG Reduction Targets**

Scope	Targets	
Scope 1	**2030***	▼ 10%
	2035*	▼ 25%
	2040*	▼ 90%
Scope 3	**2045***	▼ 75%
Scopes 1, 2, & 3 Total	**2045***	▼ 90%
	2045	**Carbon Neutrality** Negate any residual emissions through carbon removal

* Compared to 2019 Levels

Climate Action Development

The University of California Framework for Incorporating Environmental Justice & Climate Justice into Climate Action (EJCJ Framework) is a resource for UC campuses to develop climate actions that can reduce environmental harms and benefit communities most vulnerable to climate impacts. This framework informed the inclusive approach to stakeholder engagement and the equity-centered approach to action development and prioritization. Through a targeted stakeholder engagement process, UCR identified fifteen (15) new climate actions that were evaluated for GHG reduction potential, cost to implement, cost savings, capacity to implement, public health impacts, and equity impacts. Five actions were then selected as short-term priorities (see items **highlighted in blue** in the following list):

1 

All-Electric Buildings
Establish an all-electric green building guidelines for new construction.

2 

Energy Analysis Systems
Develop a campus building and facility energy analytics program using tools such as SkySpark and jointly led by campus operations leadership and student interns.

3 

Battery Storage Study
Investigate use of battery storage for existing buildings.

4 

Sustainable Fleet Transition Plan
Develop a University Fleet Transition Plan to replace existing diesel and gasoline vehicles with more sustainable options, such as zero-emission vehicles, plug-in hybrid, or dedicated clean vehicles where feasible.

5 

EV Funding
Partner with local and state organizations to assist in securing grant funding for low/zero-emission fleet vehicles and charging infrastructure for students, staff, and faculty use.

6 

Regional Connectivity
Partner with the City of Riverside, relevant transportation agencies, and nearby jurisdictions to increase the connectivity of active transportation infrastructure (bike lanes, path/trail connections) and strategize future land use and housing development to aid in campus commuting.

7 

Micromobility Study
Conduct a needs assessment and identify strategies that make sustainable transportation options convenient, safe, and the preferred choice for students and faculty to commute and move around campus. The study will be developed with the help of students and can consider safety improvements for pedestrians, scooters, public bike rental programs, and campus electric bus systems.

8 

Micromobility Infrastructure
Increase micromobility infrastructure, such as for scooters and bicycles, by adding protected lanes, storage cages at campus facilities, and shade structures across micromobility pathways. This could include providing more shade structures or trees along pathways.

9 

Student Commute Survey
Conduct an annual student commuting survey to better understand student commute patterns and identify solutions to reduce single occupant vehicle use and increase campus accessibility.

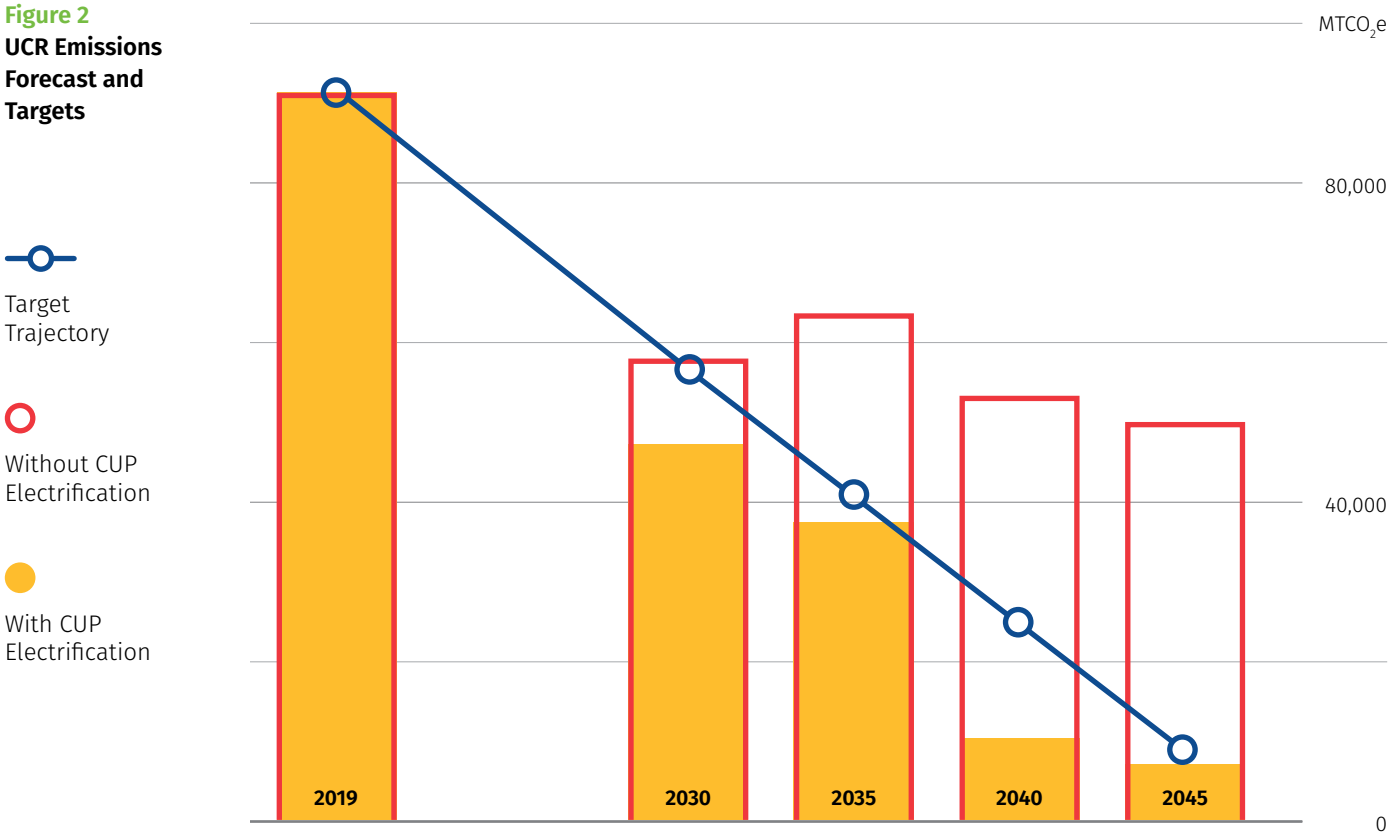
10 

Compost Improvements
Provide more compost bins and secure funding for Facilities Services to enforce composting and Senate Bill (SB) 1383.

11 

R'Garden Program
Develop a climate-resilient food-production living lab through R'Garden and secure funding.

Figure 2
UCR Emissions Forecast and Targets



12 **Tree Planting**
Plant more climate appropriate, native, and drought-tolerant trees on campus to provide shade in areas with considerable foot traffic and to sequester carbon.

13 **Campus Resilience**
Enhance campus resilience against climate hazards by developing emergency mitigation and response plans, expanding emergency training programs, and installing weather stations around campus.

14 **Campus Campaign**
Create a coordinated marketing and media campaign to enhance the visibility and impact of sustainability and climate action on campus to reach a larger audience, including students, faculty, staff, and visitors.

15 **Academic Sustainability**
Identify and create sustainability-related curriculum and living lab opportunities for students.

Twenty-five (25) additional climate actions were identified during the CAAP action development process that were not selected for further evaluation but are described in the CAAP.

Next Steps

The successful implementation of the CAAP is contingent upon securing adequate funding to support its proposed actions. As a next step, UCR will leverage the 15 CAAP actions to assess the types of funding required and pursue appropriate sources at the local, state, and federal levels.

As the UC Policy is periodically updated, UCR will continue to monitor and respond to new UC Policy requirements and adjust reporting tactics accordingly. To monitor CAAP implementation progress, UCR will adhere to the UC Policy requirements by reporting progress in UCR's Annual Report on Sustainable Practices. UCR will continue to collaborate with a diverse range of stakeholders, maintain communications on CAAP action progress, and update the CAAP as necessary to reflect the campus's shifting needs, priorities, or climate context. Along with annual internal assessments and goal-realignment, a full CAAP re-evaluation and update will be conducted in 2035 in line with the Long Range Development Plan outcomes assessment.

INTRODUCTION

01

Climate change is the long-term change in temperatures and weather patterns. Though the climate can change naturally, human activities have been the main driver of recent climate change, primarily due to burning fossil fuels, such as coal, oil, and natural gas. These activities release additional greenhouse gas (GHG) emissions that act like a blanket around the earth, trapping the sun's heat and causing the Earth to warm at an unprecedented rate. With this warming comes additional consequences, such as intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms, and declining biodiversity.[2] [3] [4]

The United Nations Intergovernmental Panel on Climate Change (IPCC) — the leading international body for assessing climate science — noted that more severe climate impacts could be avoided if global warming is limited to 1.5 degrees Celsius (°C) (or 2.7 degrees Fahrenheit [°F]) above pre-industrial levels. To do this, global anthropogenic carbon dioxide (CO_2) levels need to fall by at least 45% from 2010 levels by 2030 and reach net zero (i.e., balance the emissions produced and removed from the atmosphere) by 2050. In alignment with this guidance, the State of California has established GHG reduction targets (including a commitment to achieving carbon neutrality by 2045), developed a comprehensive Scoping Plan outlining the strategies required to meet these targets, and conducts periodic climate change assessments. The University of California, Riverside (UCR) has also made significant contributions to climate science through its research centers and programs and by actively participating in California's Fifth Climate Change Assessment.[5] [6]

UCR's Climate Action and Adaptation Plan (CAAP) was developed in response to the escalating challenges posed by climate change. The CAAP builds on previous planning efforts, such as the 2024 UCR Campus Decarbonization Study, to meet the UC Sustainable Practices Policy (UC Policy) requirements and provide guidance on reducing GHG emissions from operations, adapting to climate hazards, collaborating with partners on sustainable solutions, and integrating climate equity and justice into campus operations and planning. The CAAP addresses climate change through two approaches – mitigation and adaptation. Climate mitigation aims to reduce the amount of GHG emissions generated. Climate adaptation responds to the impacts of climate hazards, such as extreme heat and drought. Beyond climate mitigation and adaptation, CAAP actions are also meant to provide additional co-benefits, such as improved air quality and reduced operational costs. This plan was developed by the UCR Office of Sustainability in coordination with Planning, Design & Construction and Facilities Services following an extensive stakeholder engagement process with students, faculty, staff, and community members that followed guidance from the UC Framework for Incorporating Environmental Justice & Climate Justice into Climate Action (EJCJ Framework). By analyzing emissions and climate data and identifying priority actions, the CAAP marks a foundational step in UCR's climate movement, empowering faculty, staff, and students to develop action implementation roadmaps, establish partnerships, pursue funding opportunities, and make informed decisions. As climate action planning is an iterative process, the CAAP is a living document that is meant to reflect the current physical, political, and financial climate impacting the campus.

The plan comprises the following key elements:

Previous UCR climate mitigation and adaptation efforts

Overview of the community and stakeholder engagement strategy

Updated 2019 UCR GHG emissions inventory and emissions analysis

GHG emissions forecast for 2019-2045

GHG emissions reduction targets

High-level climate risk assessment

Evaluation and prioritization of 15 new climate actions

Implementation and monitoring strategy

[2] NASA. Climate Change. https://science.nasa.gov/climate-change

[3] United Nations. What is Climate Change? https://www.un.org/en/climatechange/what-is-climate-change

[4] Intergovernmental Panel on Climate Change. Sixth Assessment Report. https://www.ipcc.ch/report/sixth-assessment-report-cycle

[5] UCR Sustainability Research and Academic Programs. https://sustainability.ucr.edu/sustainability-research-academic-programs

[6] For the Inland Deserts Region Climate Change Assessment, UCR faculty Francesca Hopkins is a Lead Researcher, Ryan Sendejas is a Lead Author, and 16 additional UCR faculty and students are contributing authors. https://www.inlanddesertsclimateassessment.com

CAAP DEVELOPMENT PROCESS

02

The UCR CAAP was developed in compliance with UC Sustainable Practices Policy (UC Policy) requirements. CAAP development was led by the UCR Office of Sustainability in strong partnership with faculty, staff, and students (see **Figure 3**). The Office of Sustainability operates in accordance with the UC Policy, which establishes goals across a range of areas, including: green building design, clean energy, climate action, sustainable transportation, sustainable building and laboratory operations, zero waste, sustainable procurement, sustainable food services, sustainable water systems, sustainability at UC Health, general sustainability performance assessment, health and well-being, and anti-racism, diversity, equity, and inclusion.

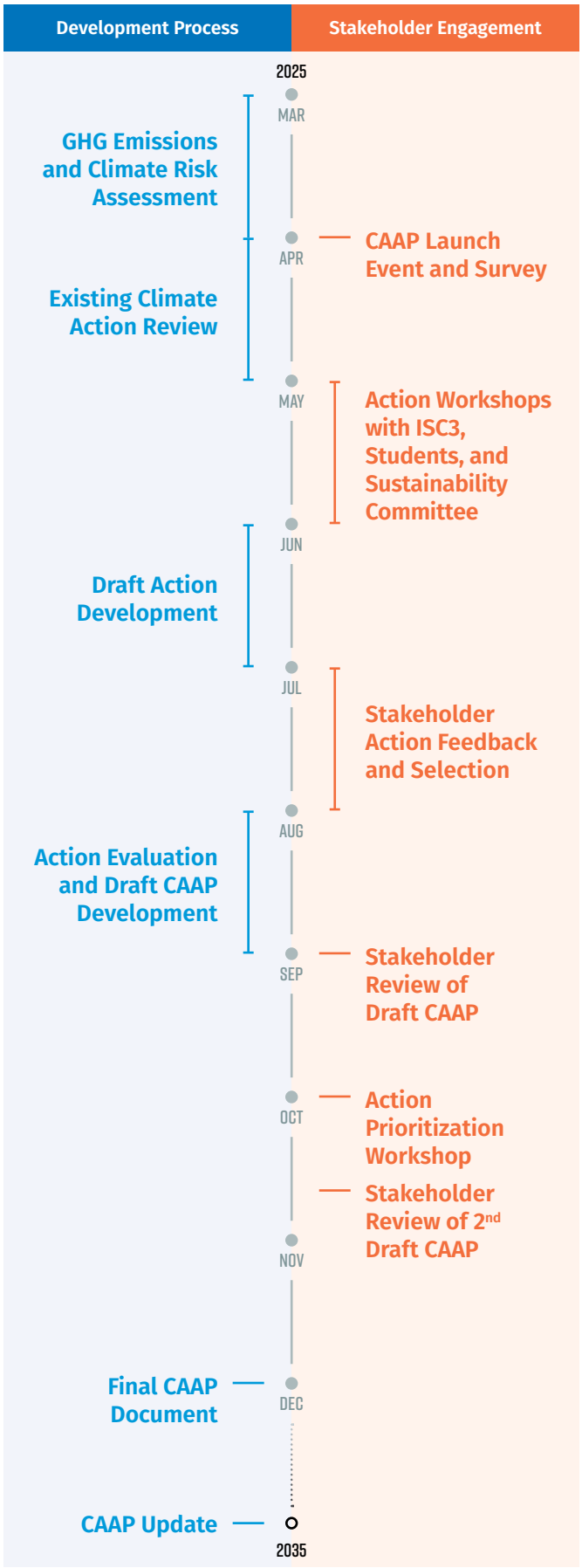
UCR SUSTAINABILITY STORIES

> I want to make sustainability feel real and relevant to students. Sharing the work being done behind the scenes—and showing how others can get involved keeps me motivated to keep pushing these efforts forward.

Sathya Srinivasan
Communications & Engagement
Student Assistant

Sathya is a Computer Science major at UCR and a student assistant in the Office of Sustainability. He focuses on digital storytelling, accessibility, and platform strategy to better communicate climate-related initiatives across campus. This includes managing website updates, promoting initiatives like energy efficiency and alternative transportation, and making climate-related resources more accessible to students. He also helps highlight UCR's long-term goals around sustainability and resilience through online content and engagement. Additionally, he is passionate about integrating emerging technologies such as artificial intelligence and machine learning into new sustainability efforts at UCR to improve access, inclusivity, and long-term impact.

Figure 3 CAAP Development Process Timeline



The CAAP development process began with the CAAP Launch Event during the UCR April 2025 Earth Month events where stakeholders, including faculty, staff, and students, could provide feedback in-person or through an online survey on their climate priorities and concerns (see Campus and Community Outreach and Engagement section for detailed information on the engagement process). UCR then assessed local climate hazards and campus GHG emissions to better understand the campus's climate context. As the UC Policy requires campuses to use 2019 GHG emissions as a baseline year, UCR updated its 2019 GHG inventory to meet UC Policy requirements, including adding solid waste emissions. Once the GHG inventory was complete, UCR developed an emissions forecast from 2019-2045 and established GHG reduction targets in alignment with the UCR Campus Decarbonization Study and UC Policy guidance for Scopes 1, 2, and 3 emissions sources. These targets provide a clear framework for UCR to reduce its GHG emissions and advance climate action. Concurrently, UCR conducted a high-level climate risk assessment to identify the primary hazards UCR faces, such as extreme heat, wildfires and smoke, extreme precipitation, and drought.

Once the emissions and climate hazards analyses were complete, existing and planned climate actions were reviewed and new actions were drafted to fill the gaps. The draft actions were reviewed during stakeholder workshops with three different groups: the Inland Southern California Climate Collaborative (ISC3), the UCR Sustainability Committee, and students. Using stakeholder feedback, actions were revised and sent to stakeholders to provide final feedback and identify which actions should be included in the CAAP. Through a collaborative process with the Office of Sustainability, Planning, Design & Construction, Facilities Services, Sustainability Committee, and other stakeholders, 15 actions were selected to move forward through an action evaluation process. During this process, the actions were evaluated for GHG reduction potential, equity impacts, implementation costs, operational cost savings, public health impacts, and UCR's internal capacity to implement. Additionally, as part of the action evaluation process, potential environmental justice and climate justice concerns, opportunities to advance equity through the action, and considerations of unintended consequences were identified for each action. These results were shared through a stakeholder workshop where participants provided input on their short-term action priorities. The draft CAAP document was shared with stakeholders for review and their feedback was integrated into UCR's final CAAP.

The Office of Sustainability will oversee the implementation of the CAAP while designated departments will lead the execution of specific actions. These efforts will be supported by campus leadership, including faculty, staff, and students engaged in sustainability-focused disciplines (see CAAP Action tables for lead implementer for each action). Together, they will ensure that UCR continues to advance its sustainability goals while fostering a resilient and equitable campus community.

Climate Action Alignment

UCR Strategic Plan

UCR is guided by a Strategic Plan under the campus's mission: To transform the lives of the diverse people of California, the nation, and the world through the discovery, communication, translation, application, and preservation of knowledge – thereby enriching the state's economic, social, cultural, and environmental future.[7] The pillars of the UCR mission emphasize:

- Distinctive and transformative research and scholarship
- A rigorous, engaging, and empowering learning environment
- A welcoming, inclusive, and collaborative community
- Advancement of the public good
- A strong commitment to sustainability for climate action and environmental justice

The CAAP aligns with UCR's Strategic Plan, particularly the fifth pillar – sustainability for climate action and environmental justice.[8] Within this framework, the CAAP also supports several cross-cutting campus objectives under each Strategic Goal, including Enhance Campus Space, Serve as an Anchor Institution for Research and Economic Development in the Inland Empire, Increase Net Revenue, and Achieve Additional National Recognition.

UCR Long Range Development Plan

In 2021, UCR developed its Long Range Development Plan (LRDP) to provide a framework for future campus growth to accommodate changes in enrollment, employment, physical infrastructure and campus facilities.[9] The CAAP is also guided by the LRDP, ensuring alignment between sustainability efforts and long-term campus development goals. In particular, the CAAP builds on the LRDP Environmental Impact Report (EIR) mitigation measures, which outline strategies for reducing GHG emissions, managing air quality, conserving resources, and addressing other environmental impacts associated with campus growth.

UC Sustainable Practices Policy

In recognition of the need for an urgent, coordinated response to the climate crisis, the University of California updated its Sustainable Practices Policy in 2023 with stronger climate action goals. These new goals accelerate the transition away from fossil fuels across all 10 UC campuses and six academic health centers by committing UC locations to reduce total GHG emissions (Scopes 1, 2, and 3) by at least 90% by no later than calendar year 2045 relative to a 2019 baseline. After 2045, any residual emissions beyond the 90% reduction must be negated by carbon removal. As part of this process, campuses were expected to set progressively ambitious interim Scope 1 emission reduction targets for 2030, 2035, and 2040, adopt new climate action plans that lay out their approach for meeting Scopes 1, 2, and 3 targets, and submit the plans to the UC Office of the President. This CAAP follows the requirements of the UC Sustainable Practices Policy April 2024 Update (UC Policy) which outlines updated climate action plan requirements for campuses.[10]

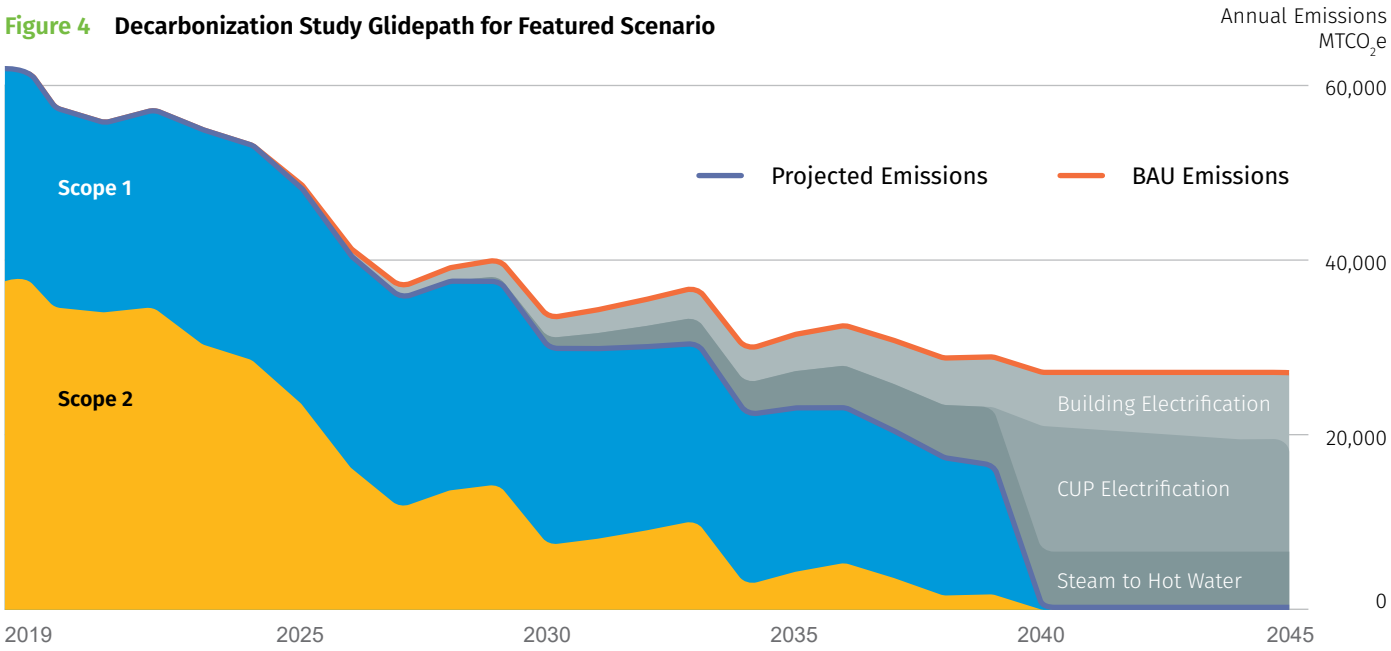
[7] UCR Mission Statement. https://www.ucr.edu/about-ucr#mission

[8] UCR. UCR Strategic Plan. https://strategicplan.ucr.edu

[9] UCR. 2021. Long Range Development Plan. https://lrdp.ucr.edu

[10] University of California. 2024. Policy on Sustainable Practices. https://policy.ucop.edu/doc/3100155/SustainablePractices

Figure 4 **Decarbonization Study Glidepath for Featured Scenario**



Campus Decarbonization Study

UCR completed a Campus Decarbonization Study in 2024 as a first step toward compliance with the UC Policy decarbonization goals.[11] This study focused on identifying a pathway to transition away from district energy natural gas use to achieve at least a 90% reduction of energy-related Scope 1 emissions by no later than 2045 relative to 2019 levels.[12] Outside of the business-as-usual scenario, eight other scenarios were reviewed and considered for feasibility. The Decarbonization Study determined that a centralized electrified heating system enabled by steam-to-hot-water conversion with hot water thermal energy storage may be the best solution for UCR to reach the emissions reduction goal (see **Figure 4**). Multiple workshops, meetings, and stakeholder engagement activities helped foster a robust plan that incorporated technical considerations and social impacts of decarbonizing UCR. Additionally, the Decarbonization Study outlines a roadmap which helps support decision-making efforts as deferred maintenance continues to impact infrastructure related to the campus electrical and steam system. Facilities Services and Planning, Design & Construction departments are able to utilize the plan to justify improvements needed at the Central Utility Plant (CUP) as well as buildings throughout campus. Implementation of the Decarbonization Study will take a phased approach in accordance with funding availability that will allow for flexibility in project spend and timing. UCR will continue to monitor and evaluate the evolving funding landscape to inform future decarbonization decisions.

The Decarbonization Study became the starting point for developing UCR's CAAP. The CAAP assesses what additional action is needed beyond the Decarbonization Study to reach interim and long-term reduction targets. The Decarbonization Study findings were also used to establish interim Scope 1 targets and inform the development of stationary energy-related actions.

Riverside Regional Action

The City of Riverside is developing a CAAP in conjunction with the City's "Riverside 2050" General Plan Update.[13] The CAAP will identify how the City will achieve citywide carbon neutrality and outline adaptation strategies to address climate change induced challenges. Additionally, Riverside County is developing a 2025 Climate Action Plan (CAP) update for its 2019 CAP. The 2025 CAP Update refines the County's efforts to meet GHG reduction strategies, specifically for the years 2035 and 2050, and builds upon the GHG reduction strategies in the 2019 CAP. The County has set a GHG target of 87% reduction below 2008 levels by 2045.

As a core partner, UCR will work together with the City and County to align climate goals and actions for the campus and the community. The UCR CAAP can aid both the City and County in meeting their GHG reduction targets and offers an opportunity for future climate action collaboration.

[11] UCR. 2024. UCR Campus Decarbonization Study. https://sustainability.ucr.edu/sites/default/files/2025-05/ucr-campus-decarbonization-study-final-nov-24_0.pdf

[12] This study does not include assessment of other Scope 1 emission sources, such as the vehicle fleet, stationary diesel, or refrigerant leakage.

[13] City of Riverside. Climate Action and Adaptation Plan website. https://riverside2050.squarespace.com/caap

State of California GHG Reduction Targets

The State of California has established ambitious GHG reduction targets, including a 40% decrease below 1990 levels by 2030, an 85% reduction by 2045, and the achievement of carbon neutrality by 2045. The remaining 15% of emissions in 2045 are expected to be addressed through carbon dioxide removal strategies. To guide progress toward these goals, the State developed the Scoping Plan for Achieving Carbon Neutrality, which outlines key strategies for meeting the targets by 2045 or earlier. California also has a longstanding history of enacting climate legislation aimed at reducing GHG emissions across all sectors of the economy. UCR's CAAP is closely aligned with the State's GHG reduction targets and Scoping Plan strategies and incorporates relevant legislation into its campus emissions forecasting and planning framework.

Relation to California Environmental Quality Act

This CAAP, prepared consistent with the UC Sustainable Practices Policy, and the associated Decarbonization Study are not legally binding and do not commit the University to the implementation of any specific GHG reduction measure or related development project, and as such are not "projects" as defined under the California Environmental Quality Act (CEQA). To the extent such studies and plans could be construed as a "project" under CEQA, they are exempt from CEQA as planning and feasibility studies. In addition to facilitating the reduction of UC-related GHGs, CAAPs are intended to serve as a guide to achieving the campus' broad climate goals, including in the areas of resilience; transportation; and diversity, equity, and inclusion.

Long Range Development Plans (LRDPs) are comprehensive land use plans that guide the siting and development of buildings and infrastructure needed to support projected campus population levels through a defined horizon year. Pursuant to CEQA Statute 21080.09, Environmental Impact Reports (EIR) are prepared to evaluate the environmental effects of LRDPs and thereby satisfy the requirements of CEQA for general development and population growth of a particular campus or medical center. The specific GHG reduction measures and the environmental effects of related projects identified in CAAPs are generally incorporated into LRDP EIRs and any subsequent tiered document pursuant to CEQA. All University projects, whether or not they are evaluated in an LRDP EIR remain subject to environmental review pursuant to CEQA at the time of project approval.

UCR's CAAP is closely aligned with the State's GHG reduction targets and Scoping Plan strategies and incorporates relevant legislation into its campus emissions forecasting and planning framework.

UCR SUSTAINABILITY STORIES

Sofia is a recent graduate of CSULB, where she earned her B.A. in Geography and a certificate in Geographic Information System (GIS). She's passionate about expanding green spaces in underserved communities through gardening tree planting and using spatial analysis tools to identify and address environmental justice trends. She's excited to contribute to the R'Garden's mission of sustainability and community resilience and is motivated by wanting to leave a green legacy that champions sustainability, climate action, and adaptation, ensuring a robust future for generations ahead.

Sofia Gaytan Gonzalez
California Climate Action Corps Fellow, R'Garden 2025–26

UCR BACKGROUND

03

Overview & Regional Context

The approximately 1,108-acre UCR main campus is located in the City of Riverside in Inland Southern California, about 55 miles east of Los Angeles and 50 miles west of Palm Springs (see **Figure 5**). The City of Riverside serves as an economic, educational, and cultural activities hub within the region, and UCR plays a crucial role in supporting these activities. Opened in 1954 as a part of the UC public university system, UCR's more than 26,000 students and 1,100 faculty boast a diverse community of innovative thinkers and engaged learners.[14] Students can choose from undergraduate, graduate, and professional degree programs within three colleges and four professional schools. Additionally, UCR is a leader in research with multiple research centers and opportunities for both undergraduate and graduate students to explore complex solutions and new innovations. Much of UCR's research is focused on sustainability and is organized under the Opportunity to Advance Sustainability, Innovation, and Social Inclusion (OASIS) umbrella. See UCR's Research and Economic Development website[15] for more information.

Sustainability is deeply rooted in UCR's research, academics, and campus life—from student-led programs like R'Garden and EcoHighlanders, to faculty initiatives such as the Center for Environmental Research and Technology, to departmental efforts such as installing solar panels—making it an integral component of UCR's long-term approach to growth and success. This can be seen in planning documents such as the UCR Strategic Plan, which has a pillar of "Sustainability for climate action and environmental justice" and the 2021 LRDP, which has a goal to "Enhance Environmental Sustainability and Resilience".[16] [17]

UCR is committed to leadership in regional sustainability through collaboration and partnerships with regional entities, particularly the City of Riverside, Riverside County, and Inland Southern California Climate Collaborative (ISC3) climate action planning efforts. UCR's sustainability initiatives can support the achievement of sustainability goals set by both the City and County of Riverside, while also enhancing the overall resilience of the local community.

UCR BY THE NUMBERS

1,100+
Acres, Main Campus

26,000+
Empowered Students

1,100+
Distinguished Faculty

7
Colleges + Professional Schools

1954
Year Established

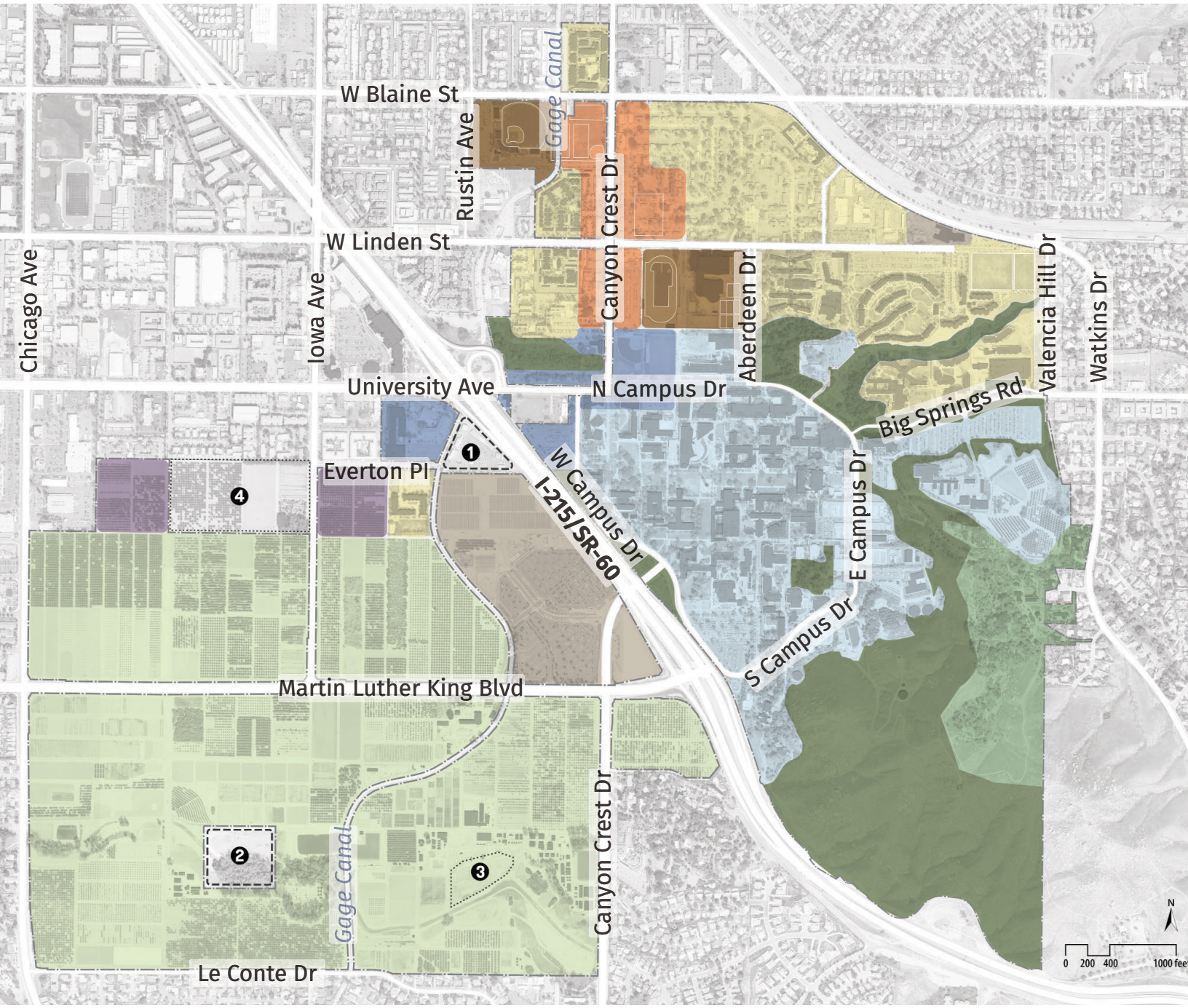
[14] Data is as of Fall 2024

[15] UC Riverside. Research and Economic Development. https://research.ucr.edu

[16] UCR. 2024. UCR 2030 Central Campus Level Strategic Initiatives. https://documents.ucr.edu/strategic-plan/uc-riverside_central-campus-strategic-plan.pdf

[17] UCR. 2021. Long Range Development Plan https://lrdp.ucr.edu/sites/default/files/2021-11/2021lrdp-final_0.pdf

Figure 5 **UCR Land Use Plan**



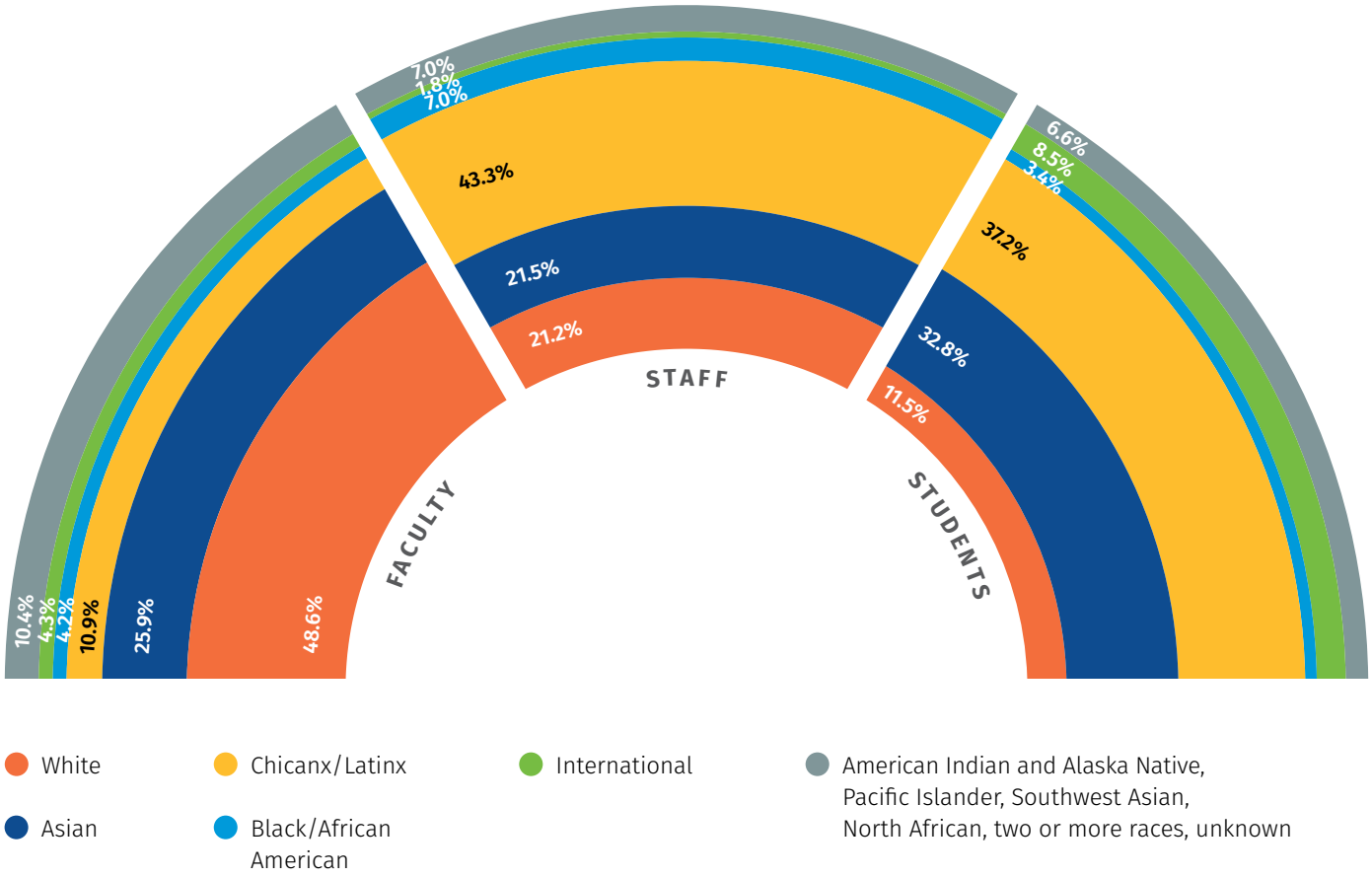
1. Caltrans Yard, not in LRDP planning scope
2. City of Riverside property, not in LRDP planning scope
3. Development of this approximately 3.25-acre site shall be prohibited from developing uses per a Covenant to Restrict Use of Property entered into between the Department of Toxic Substances Control and The Regents of the University of California, in which a deed restriction was filed on July 26, 2006.
4. California Air Resources Board Southern California HQ

- Academics & Research
- Agricultural/Campus Research
- Land-Based Research
- Campus Support
- Open Space Reserve
- UCR Botanic Gardens
- Recreation & Athletics
- Student Neighborhood
- Canyon Crest Gateway
- University Avenue Gateway
- Non-UCR Land of Interest

Source: UCR 2021 Long Range Development Plan

Community Demographics

Figure 6 **UCR Faculty, Staff, and Student Demographics** 2024-2025



UCR's campus supports a diverse student, staff, and faculty population. For the 2024-2025 school year, UCR enrolled over 26,000 students - 37.2% of which identified as Chicanx/Latinx, 32.8% Asian, 11.5% White, 6.6% Native American, Pacific Islander, or Other, and 3.4% Black/African American (see **Figure 6**). Additionally, 8.5% of students at UCR are international.[18] UCR staff follow a similar demographic trend; as of Fall 2024, 43.3% of staff were Chicanx/Latinx, 21.5% Asian, 21.2% White, 7% Black/African American, 7% Native, Islander, or Other, and 1.8% International. By comparison, UCR faculty were 48.6% White, 25.9% Asian, 10.9% Chicanx/Latinx, 10.4% Native, Islander, or Other, 4.2% Black/African American, and 4.3% International.[19]

UCR supports students from a range of socio-economic backgrounds. Almost 57% of undergraduates at UCR are the first in their family to attend college and about half of undergraduates are eligible to receive Pell grants (awarded to families earning less than $65,000 per year).[20] UCR provides resources and support to create equal access to educational opportunities at UCR regardless of immigration status or cultural background.[21]

UCR is located within the City of Riverside which has a population of over 319,000 of which 57.1% identify as Hispanic or Latino, 34.0% White, 7.7% Asian, 6.3% Black or African American, 2% American Indian and Alaska Native, and 0.4% Native Hawaiian and Other Pacific Islander (2024 Census). The City of Riverside's median household income is $88,404, approximately 8% lower than the state's median household income.[22] Comparatively, at the County level, 52% of residents identify as Hispanic, 31% White, 7% Asian residents, 6% Black and less than 1% Native, Islander or Other.[23] Riverside County is home to 12 federally recognized Native American reservations.

[18] UCR. Campus Facts at a glance. https://ir.ucr.edu/stats/enrollment/demographic

[19] University of California. Workforce Diversity. https://www.universityofcalifornia.edu/about-us/information-center/uc-workforce-diversity

[20] UCR. Office of Diversity, Equity, and Inclusion. https://diversity.ucr.edu

[21] UCR. Undocumented Student Programs. https://usp.ucr.edu

[22] City of Riverside. Data Dashboard. https://riversideca.gov/cedd/economic-development/data-reports/data-dashboard

[23] Riverside County. Equity, Access, and Opportunity - Where We Stand. https://rivco.org/diversity-equity-inclusion-and-access/where-we-stand

Office of Sustainability

The UCR Office of Sustainability was founded in November 2010 to advance environmental stewardship, social equity, and sustainable practices across campus.[24] In 2012, the office expanded its scope to include engagement with planning and budget, facilities management, research and curriculum, and outreach activities on campus, in the community, and across the UC system. Since its founding, the office has positioned UCR as a leader in sustainability at both national and global levels. It has aligned its approach with the frameworks of the United Nations Sustainable Development Goals, the Association for the Advancement of Sustainability in Higher Education,[25] and the UC Office of the President, incorporating the "triple bottom line" of people, planet, and profit. At UCR, sustainability focuses on three key areas:[26]

Economic and Social Equity

Promoting secure livelihoods, social justice, and intergenerational well-being.

Academic and Policy Investments

Supporting ecological health and studying the interconnections among economy, society, and the environment, with attention to past legacies, present constraints, and future sustainability.

Environmental Justice

Confronting environmental racism, promoting equity, and advancing transparency and democratic inclusion in institutional decision-making affecting environmental costs and benefits.

To achieve the goals outlined in the UC Policy, the Office of Sustainability collaborates closely with Planning, Design & Construction; Facilities Services; Environmental Health and Safety; Transportation and Parking Services; the Green Labs Program; Procurement; Dining Services; R'Healthy Campus; Sustainability in Academics; and other campus departments. Representatives from each department meet regularly to provide status updates, review policies, recommend adjustments, and compile annual reports that are submitted to the UC Office of the President for review and publication.[27] The Office of Sustainability also works with student organizations such as GCAP, R'Cycle Co-op, CALPIRG, and Native student organizations—groups whose perspectives are critical for advancing equity and environmental justice on campus and the community.

Looking ahead, the Office of Sustainability is committed to collaboratively implementing the CAAP, focusing on reducing GHG emissions, fostering a culture of sustainability across operations, engagement, and academics, and supporting curriculum and research that prepare students to become sustainability-conscious leaders.

UCR SUSTAINABILITY STORIES

Nicole has a master's degree in chemical and environmental engineering and her 30-year career has been dedicated to help accelerate our successful transition to the clean economy in the fields of air quality, transportation, energy and agriculture. Formerly a consultant to the California Energy Commission and the executive director of the College of Engineering, Center for Environmental Research and Technology at UCR, she now serves as the Opportunities to Advance Sustainability, Innovation, and Social Inclusion (OASIS) advisor under the Office of Technology Partnerships for Research and Economic Development, overseeing OASIS programs for community, faculty and startup companies.

The Office of Technology Partnerships supports innovation and commercialization in clean agriculture, technology, and environmental fields, with a focus on the SoCal OASIS network of programs. It provides resources for students, faculty, and community members to launch climate-related businesses or license technologies. The office has funded projects such as flood-tolerant rice, safer pesticide alternatives, and advanced batteries, while also fostering cross-disciplinary research and aligns corporate partnerships with UCR researchers.

What motivates her are the success stories of groups of people who are able to influence the outcomes of select regions of the world - proof that conservation and restoration practices combined with policies and smart technology can change our world for the better. She wishes for her grandkids to breathe clean air and eat clean food and be able to witness vibrant reefs full of abundant sea life. Without our collective efforts, this likely won't be the case.

Nicole Cleary

Entrepreneur in Residence, Technology Partnerships Department

Sustainability Committee Member

[24] UCR. Office of Sustainability. https://sustainability.ucr.edu

[25] The Association for the Advancement of Sustainability in Higher Education https://www.aashe.org

[26] UCR Academic Senate. Ad Hoc Committee on Sustainability Report. https://ucr-senate-public.s3.amazonaws.com/issues/17-18.%20CR.%20Sustainability%20Ad%20Hoc.pdf

[27] University of California. "University of California, Riverside," Sustainability Annual Report 2024. https://sustainabilityreport.ucop.edu/2024/locations/uc-riverside

UC Framework for Incorporating Environmental Justice & Climate Justice

The EJCJ Framework was created as a resource for UC campuses to integrate equity, diversity, inclusion, and justice into climate action planning. **Environmental Justice** is a community-centered response to environmental racism that seeks to abolish environmental harms rather than simply redistribute harms. **Climate Justice** insists on a shift from a discourse on GHG emissions and melting ice caps into a civil rights movement with the people and communities most vulnerable to climate impacts at its heart.[28] The EJCJ Framework is intended to build relationships between UCR and the surrounding and frontline communities as well as share power and responsibility to lead implementation of climate actions. The EJCJ Framework lists five questions that campus leaders should use to evaluate all proposed climate actions and plans:

1. **What** specific groups, on or off campuses, are directly and indirectly impacted by this climate action or policy proposal?

2. **Who** will benefit from and/or be burdened by this decision? Is this support or relief prioritized for the people and communities who need it the most and are already marginalized, lower-income, disabled, communities of color?

3. **What** was the approach for engaging Black, Indigenous, and People of Color (BIPOC), and other underrepresented and marginalized groups, including people with disabilities and LGBTQIA communities, in reviewing this climate action?

4. **How** could this climate action potentially ignore or worsen existing disparities or produce other unintended consequences on or off campuses?

5. **How** does this climate action proposal prioritize improvements, programs, and/or changes that address the needs of underrepresented and marginalized communities, on or off campuses?

The UC Framework for Incorporating Environmental & Climate Justice into Climate Action is a guide to help staff and leaders at the UC promote equity, diversity, inclusion, and justice into climate actions.

The principles in the EJCJ Framework were balanced with the capacity, skills and network of UCR staff, students, and climate fellows to inform an actionable engagement approach. Additionally, the guidance directly informed the methods to evaluate and prioritize actions. Specifically, the following opportunities to center environmental justice and climate justice were leveraged at each step:

During Engagement Approach Development
UCR staff, students, and climate fellows identified key stakeholders including marginalized groups who should be involved in the CAAP process (relates to question 1 and 3). Details on stakeholders, activities, and feedback are included in the Campus and Community Engagement and Education section.

During Draft Action Development
Stakeholders were asked to identify priority climate justice concerns and ideas to improve them. The technical team evaluated the actions' potential to improve/worsen existing health and socioeconomic disparities and considered potential unintended consequences.

To Prioritize Actions
EJCJ Framework questions 2, 4, and 5 were used to prioritize actions.

[28] University of California. UC Framework for Incorporating Environmental Justice and Climate Justice. https://www.ucop.edu/leading-on-climate/_files/uc-framework-for-ejcj-in-climate-action_final-4.21.22.pdf

Existing Sustainable Operations Efforts

UCR has a history of climate-friendly policies, programs, and projects. Some of UCR's previous and ongoing efforts to reduce GHG emissions and increase resiliency are summarized in this section. All data is current as of September 2025.

Green Buildings and Facilities

Green Labs Program
Developed in 2014, the Green Labs Program promotes the reduction of the energy and resource waste created by laboratories without disturbing research objectives. The program includes a Green Labs Certification, energy- and water-efficient equipment incentives, and resources for sustainability in the lab.

LEED Requirement for Campus Buildings
New buildings and major renovations are required to meet minimum LEED Gold, and major renovations must meet compliance per the UC Sustainable Practices Policy. The total number of UCR LEED certifications are three Platinum, eight Gold, three Silver, and one Certified.[29]

UCR Campus Decarbonization Study
This Study identified multiple pathways for reducing 90% of energy-related Scope 1 emissions by no later than 2045. The preferred pathway includes a centralized electrified heating system enabled by steam-to-hot-water conversion with hot water thermal energy storage.

Energy Efficiency Projects
UCR has undertaken various projects including adding insulation; installing variable frequency drive retrofits for lab exhausts; retrofitting LED lighting; updating lighting controls; and heating, ventilation and air conditioning upgrades and optimization.

Tree Campus Higher Education Certification
UCR maintains campus-wide tree stewardship aligned with the Arbor Day Foundation's Tree Campus Higher Education standards. This includes a campus tree advisory committee, a tree care plan, Arbor Day observances, student engagement, and dedicated funding for tree management.

Bee-Friendly Campus Certification
UCR is designated as a pollinator-friendly campus and an affiliate of the Bee Campus USA program. Through native plantings, reduced pesticide use, nest site provision, and campus gardens that support pollinators, the certification supports biodiversity and ecosystem health on campus.

[29] The LEED Certifications noted here are for the UCR main campus and does not include P3s projects.

Sustainable Transportation

EV Charging Program
Offers Level I, II, and III charging infrastructure. There are a total of 183 available and accessible active electric charging ports on UCR's campus. UCR affiliates have reduced rates for charging.

R'Commute Incentive Program
Registered walkers, bicyclists, carpoolers, vanpoolers, public transit riders, and teleworkers are eligible to receive a complimentary 10-pack parking permit each quarter. Carpoolers receive a 50% discount on parking permits and active transport users can use showers and lockers at the Student Recreation Center.

Emergency Ride Home Program
Provides a ride home to non-personal vehicle commuters, carpoolers, or vanpoolers when they experience an emergency or unexpected overtime.

UPASS Program
Provides free mobile RTA transit passes for UCR students, staff, and faculty.

Campus Bike Amenities
Bike amenities include 3,500 bike parking spaces on campus, 16 bike cages, and bike fix-it locations.

Hybrid Work
Department-specific hybrid work policies are in place to optimize remote work and reduce commuting emissions.

Clean Energy

Zero Waste

Campus Solar
The campus's existing PV production capacity is approximately 9 megawatts. Solar projects include:

- Solar farm through a power purchase agreement
- Solar panels on facility rooftops including the Student Recreation Center South, Student Services Building, Glasgow, Bourns Hall, School of Business, School of Medicine Education Building 2, West Lothian, and the Center for Environmental Research and Technology

BigBelly Waste Bins
Recycling and composting bins are placed around campus and in new construction projects to promote zero waste.

Zero Waste Dining Program
Dining hall program for sustainable dining practices including reducing waste and offering vegetarian/vegan options.

Plastic-Free Campus Program
Replaces plastic with metal, biodegradable, and compostable alternatives. UCR completely phased out plastic bags and partially phased out single-use plastic foodware in UCR-operated dining facilities, cafés, to-go food facilities, retail and most leased or third-party-operated food facilities and concessions. UCR intends to include single-use plastic elimination policy language in pouring rights contracts and leases when they are renewed.

Reusable Container Program
Pilot project to replace plastic single-use containers with reusable containers.

E-Waste Recycling Program
Recycling program to reduce waste from disposed electronics.

ScotSurplus
A campus program that collects and resells surplus furniture, office supplies, electronics, and lab equipment to students, staff, and the community at reduced prices. By extending the life of materials and diverting items from the landfill, ScotSurplus supports UCR's Zero Waste goals and promotes a circular campus economy.

[30] University of California. 2021. Sustainable Procurement Guidelines. https://www.ucop.edu/procurement-services/for-ucstaff/sustainable-procurement/sustainableprocurementguidelines.pdf

UCR SUSTAINABILITY STORIES

Keith (*they/them*) is an Assistant Professor of Ethnic Studies and is a faculty member in the Labor Studies department and affiliated faculty in the Department of Society, Environment, and Health Equity. They are a faculty representative on the Sustainability Committee for the College of Humanities, Arts, and Social Sciences. The Department of Ethnic Studies hosts courses on race and the environment, Indigenous ecologies, environmental justice, and Indigenous Traditional Ecological Knowledge. As a member of the Ethnic Studies faculty, Keith teaches critical approaches to and critiques of sustainability discourses and climate justice through the lens of racial capitalism, abolition, and Indigenous decolonization. Keith is motivated to be involved in climate mitigation and adaptation projects due to their commitments to local and global community health and safety that does not replicate the harms of racist, capitalist, and colonial ecologies that historically and contemporarily shape the world. They bring a critical lens to thinking about how climate mitigation/adaptation programs get planned and implemented, advocating for structural change that centers the needs of the many.

Keith Miyake
Assistant Professor
of Ethnic Studies

Sustainable Food Services and Procurement

UCR Food Recovery
Dining Services has a decades-long partnership with Inland Harvest to recover surplus food from the Residential Restaurant. The food recovery organization distributes the donated food to local feeding agencies, including church pantries, outreach programs, soup kitchens, and homeless and battered women's shelters.

Scotty's Final Call
Managed collaboratively by The Well and Basic Needs, Scotty's Final Call is a resource that sends real-time notifications about well-being events offering free food or supplies. It also alerts students, staff, and faculty when leftover food becomes available at various locations across campus.

Lab to Farm
Part of the UCR Microbiology and Plant Pathology program that aims to turn food waste into compost by creating a closed-loop farming system.

Green Procurement
UCR reports on green spend, as defined in the Sustainable Procurement Guidelines.[30]

ScottyEats Program
The ScottyEats Program is a Basic Needs program that reduces food waste by redistributing surplus meals from UCR Dining Services to students in need. The program allows students to access nutritious meals at no cost, supporting food security while promoting sustainable food practices on campus. Launched in January 2025 through a partnership between UCR Dining Services, UCR Basic Needs, and Associated Students of UCR, the program recovers leftover food from Tuesday night dinners at Glasgow Dining Hall. During the winter and spring quarters, ScottyEats recovered approximately 1,900 pounds of food, providing about 1,700 meals to UCR students.

R'Garden
Space for students, faculty, staff, and community members to grow fresh produce while learning about sustainability through a food systems approach.

Resilience

Emergency Notification System
Environmental Health and Safety (EH&S) notifies the campus about an emergency or dangerous situation involving an immediate threat to the health and safety of the campus community.

Outdoor and Indoor Heat Illness Prevention
EH&S provides resources on outdoor and indoor heat illness prevention.

Wildfire Smoke Resources
EH&S provides training and resources on wildfire smoke such as N95 masks for employees.

Indoor Air Quality (IAQ) Checks
EH&S conducts IAQ assessments based on requests and identified needs, and works with Facilities Services to address issues. Continuous air monitoring can be performed when necessary, such as during large demolition or remodeling projects. Students and staff can submit a ticket if there are air quality issues.

Drought-Resistant Bermudagrass
UCR has licensed a new drought-resistant bermudagrass cultivar for landscaping.

Electrical Infrastructure Upgrades
Smart switches installed on the campus 12 kV distribution loop allow Facilities staff to switch between feeders to isolate and repair faults, upgrade infrastructure, and maintain service without interrupting power to surrounding buildings.

Recognition

AASHE STARS Reporting
UCR uses the Association for the Advancement of Sustainability in Higher Education (AASHE) Sustainability Tracking Assessment and Rating System (STARS) to report achievements relating to sustainability in five areas: academics, engagement, operations, planning and administration, and innovation and leadership.[31] UCR achieved Silver accreditation in 2013 and Gold in 2016, 2021, and 2025.[32]

Sustainability Awards
UCR has been recognized in the Sierra 2021 Cool Schools and the 2025 Guide to Green Colleges.[33] [34]

[31] UCR. 2024. UCR 2030 Central Campus Level Strategic Initiatives. https://documents.ucr.edu/strategic-plan/uc-riverside_central-campus-strategic-plan.pdf

[32] AASHE. "The Sustainability Tracking, Assessment & Rating System". https://reports.aashe.org/accounts/login/?next=/tool/university-of-california-riverside-ca

[33] Sierra. Sept. 9, 2021. "Cool Schools 2021 Full Ranking". https://www.sierraclub.org/sierra/cool-schools-2021/cool-schools-2021-full-ranking

[34] The Princeton Review. "University of California—Riverside (UCR)". https://www.princetonreview.com/college/university-california-riverside-1023545?ceid=green-colleges

Center for Environmental Research and Technology (CE-CERT)
The center includes five Research Focus Areas: Renewable Energy Production and Integration, Emissions and Fuels (Carbon and Non-Carbon) Alternatives, Atmospheric Pollution Information and Modeling, Transportation Systems: Vehicle and Infrastructure Interaction, and Exposure and Health Effects.

Winston Chung Global Energy Center
Focuses on bridging the gap between industry and academia to address energy generation, storage, and distribution needs and issues.

Energy, Economics, and Environment (E3) Research Center
Cultivates an interdisciplinary research environment to study and explore the nexus of energy, economics, and the environment.

Opportunity to Advance Sustainability, Innovation, and Social Inclusion (OASIS) Initiative
Innovation hub focused on sustainability, innovation, and social inclusion. The initiative hosts several projects including a new campus building, the SoCal OASIS Park, which will be a center for research in climate change, air quality, and mobility.

Sustainability Studies Capstone Course (GSST 191C COURSE)
Course involves research and implementation of projects that investigate how gender and sexuality are shaped by local, national, and transnational approaches to issues such as climate change, food and water security, species diversity, and renewable resources.

Bonnie Reiss Climate Action Fellowship Program
Funds student-generated projects that support the UC system's goal to produce net zero emissions.

Green Campus Action Plan (GCAP)
A student-led initiative dedicated to fostering sustainability on campus through grants, educational programs, and community engagement. Funded by a $2.50 per-quarter student fee, GCAP has invested over $700,000 into sustainability efforts, including $203,000 in Green Grants, $327,000 in large-scale campus initiatives, and $187,000 in student internships across 12 departments.

Sustainability in Residential Life (EcoHighlanders)
Engages students to implement educational events and activities aimed at minimizing the campus's environmental impact and carbon footprint.

Academics and Engagement

Earth Month Events
The Office of Sustainability partners with other departments and organizations to host Earth Month events with tours, fairs, workshops, and panels for the UCR campus and surrounding community to learn and engage with climate topics.

UCR College Corps
A statewide initiative that engages students in community service to address critical issues such as climate action, education, and food insecurity. At UCR, fellows serve in various capacities, including urban greening, environmental education, and sustainability projects, contributing to the campus's broader sustainability goals. The program offers students professional development opportunities, financial support, and a platform to actively participate in community-driven climate solutions.

California Climate Action Corps (CCAC)
A statewide AmeriCorps program that partners with public agencies, nonprofits, tribes, and educational institutions to support climate action. CCAC Fellows assist with initiatives such as urban greening, wildfire resiliency, organic waste diversion, edible food recovery, and community climate education.

UC Global Climate Leadership Council (GCLC)
Established in 2014, serves as a strategic advisory body to UC leadership, including faculty, students, administrators, and external experts, guiding the system's climate and sustainability efforts. The council focuses on areas such as energy, research, communications, policy, climate action planning, climate equity and justice, and financial strategies. In 2022, it established the Pathways to Fossil-Free UC Task Force to accelerate decarbonization, emphasizing campus electrification and climate justice integration.

Living Labs
UCR is piloting a program development project that will leverage campus as a living laboratory best practices from peer universities, pilot living lab program development that could offer a scalable framework for other UC campuses, and represent UC in the University Climate Change Coalition's new Living Lab Community of Practice. The UCR Living Lab program aims to transform campus operations and resources into a platform for students, faculty, and staff to collaboratively drive sustainability and climate action through research and education.

Student Sustainability Organizations

Student sustainability organizations at UCR play a vital role in advancing environmental stewardship and social equity on campus. These groups educate the campus on climate and sustainability, participate in campus operations projects, and advocate to students, staff, faculty, and campus leadership. Their activities include hosting events, attending meetings, organizing outreach tabling, and running campaigns that foster a culture of sustainability and promote advocacy on environmental and social issues. Participation in these organizations provides students with professional and leadership experience, personal growth, and a deeper understanding of the sustainability challenges facing the campus. The following is a list of student sustainability organizations:

Student Sustainability Organizations

Sustainable Developments
A group that focuses on promoting environmental sustainability and developing green technologies. It provides a diverse, collaborative platform for students from various majors to gain skills in planning, design, and problem-solving across multiple disciplines. The group aims to demonstrate students' capability to create innovative solutions, raise awareness about sustainability, and inspire others through inclusive, innovative, and impactful green projects.

Revive Thrift
A club that provides a welcoming space for students and community members who enjoy thrifting. The club promotes sustainability by raising awareness of consumer waste and fast fashion while also teaching members how to thrift, flip, and resell items for extra income. Its main events are thrift trips, where participants can discover clothes and antiques and build connections.

R'Cycle Co-op
The co-op is dedicated to promoting cycling, sustainability, safety education, and advocacy for alternative transportation. Open to all students, staff, and faculty, the club offers meetings, group rides, and training. Its long-term goal is to establish a campus facility providing affordable bikes, discounted parts, loaner tools, and technical support. Beyond campus, the co-op advocates for sustainable transportation at local, state, and federal levels, aiming to build community and make a positive impact, one bike ride at a time.

Student Sustainability Organizations

Sustainable UCR
A group that has spent over a decade advancing sustainability on campus through projects like solar panel installations, composting, and Earth Week events. The group now focuses on food, water, waste, energy, and culture, while welcoming new ideas for projects, events, and collaborations.

Environmental Science Club
A club that provides students with hands-on learning opportunities through field trips, professional talks, and networking events. Open to all interested students, the club connects classroom knowledge to real-world applications while supporting career development and preparing future environmental science leaders.

Environmental Sciences Mini-Graduate Student Association
A group that organizes social, professional development, and networking opportunities, often in collaboration with related programs, while serving as a unified voice within the Graduate Student Association to promote interaction, inclusivity, equity, and communication across the interdisciplinary community.

Gardening Club
A club that unites students passionate about sustainability, local food systems, and environmental justice. It provides a welcoming space for gardeners of all levels to learn, collaborate, and take action alongside peers, nonprofits, and community activists to grow a stronger, more sustainable community.

CA Public Interest Research Group (CALPIRG)
A student-run, statewide nonprofit advocacy group that empowers students to tackle pressing social and environmental issues. CALPIRG at UC Riverside focuses on campaigns such as climate action, affordable textbooks, hunger and homelessness, and civic engagement. Through organizing, advocacy, and community partnerships, the group provides students with opportunities to build leadership skills while driving positive change on campus and beyond.

Association of Environmental Professionals (AEP)
AEP is a new organization on campus dedicated to fostering professional development for students looking to pursue environmental careers. AEP achieves this through connections between environmental professionals and students, networking events, resume workshops and more.

Environmental Justice and Climate Justice

Initiatives that reduce environmental inequities and advance climate justice benefit marginalized populations, improve public health, and remove environmental burdens. Several of UCR's existing initiatives listed previously aim to achieve these outcomes:

- Reduce food insecurity for low-income students (UCR Basic Needs R'Garden, UCR Bonnie Reiss Leading on Climate)
- Address health disparities related to soil, water and air pollution – or build capacity for students to conduct research in these areas (Center for Agriculture, Food, and the Environment [CAFÉ]; Bridging Regional Ecology, Aerosolized Toxins, and Health Effects [BREATH]; School of Medicine Center for Health Disparities Research)
- Provide healthcare services and education for those with limited access and financial means (UCR Healthy Campus, Riverside Free Clinic)
- Provide free affordable transportation options for students (UPASS Program)
- Prepare the next generation to further environmental and climate justice efforts through courses in environmental justice and climate justice[35]

UCR SUSTAINABILITY STORIES

Angelique is a UCR alumna with a B.A. in Media and Cultural Studies. During her four years working with the Basic Needs Department, she developed a deep passion for supporting students who share similar backgrounds and experiences as her own. That passion continues to guide her work as the California Climate Action Zero Waste Fellow, where she focuses on educating and engaging students to reduce food waste and promote sustainability on campus.

Angelique Lawrence

California Climate Action Corps Fellow: Zero Waste, 2025–2026

[35] UCR. Colleges and Environmental Justice Related Courses. https://sustainability.ucr.edu/colleges-and-environmental-justice-related-courses

CAMPUS AND COMMUNITY ENGAGEMENT AND EDUCATION

04

Key Stakeholders

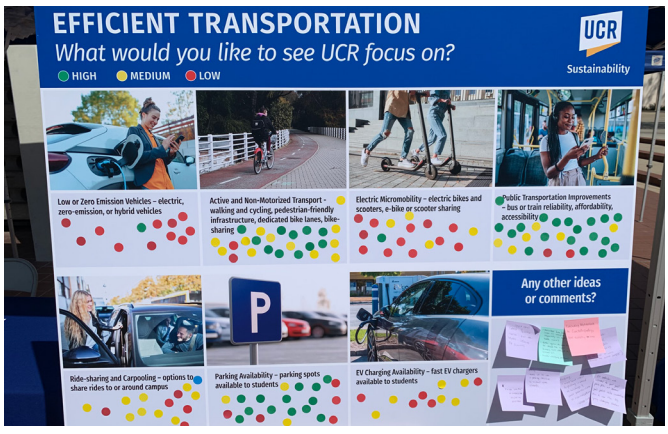
As shown in **Table 3**, the CAAP team identified three categories of on- and off-campus stakeholders (and within those, marginalized or underrepresented populations) whose feedback informed the plan. As noted in the demographic overview, students enrolled at UCR are majority BIPOC, more than half of undergraduate students are first-generation college students, and about half are eligible to receive Pell grants, indicating that they are from lower income households.

Table 3 **Stakeholder Groups**

Category	Specific Groups	Participants*
Faculty and Staff	Sustainability Committee	31
	UC Disaster Resilience Network	7
	Other staff and faculty	55
Students	GCAP	3
	Office of Sustainability Affiliated Student and Climate Fellows	13
	R'Cycle Co-Op	2
	UC CALPRIG	1
	Students responding to CAAP launch survey	59
Off-Campus Community	Inland Southern California Climate Collaborative	8
	City of Riverside local government	4
	Riverside Public Utilities	2
	Riverside Community Members (through Earth Month event, Prioritization Workshop, and surveys)	8

* The number of stakeholders participating in the CAAP launch event priority dot voting exercise are not reflected here.

The CAAP engagement strategy builds on the initial engagement and educational events that occurred during the UCR Campus Decarbonization Study development, completed in October of 2024.



Engagement Activities

The team conducted engagement at four points in the planning process. Throughout the process feedback was received through written comments, in-meeting voting activities and verbal responses, and survey responses.

1. **CAAP Launch**
   The CAAP development process was officially launched at an on-campus event intended to build awareness of sustainability, share information on the CAAP, and gain initial feedback from participants. Both feedback from the event and an online survey were used to understand community concerns, gain an understanding of action priorities, and identify the type of information and assistance that stakeholders find useful.

2. **Climate Action Development**
   Workshops were held with three stakeholder groups to identify existing actions and develop new actions UCR can take to reduce GHG emissions, address climate vulnerabilities, and advance climate justice. Stakeholders were sent a draft list of climate actions and provided feedback on action refinement and priorities. This feedback was used in a collaborative process with the Office of Sustainability; Planning, Design & Construction; Facilities Services; Sustainability Committee; and other stakeholders to select the plan's final 15 actions.

3. **Climate Action Prioritization**
   The actions were evaluated for their benefits, risks, and feasibility and presented at an open workshop for stakeholders to discuss and prioritize actions for implementation.

4. **Draft CAAP Review**
   Stakeholders were able to review and provide comments on a first and second draft of the CAAP. Comments were integrated into the final CAAP.

CAAP Launch

UCR students, faculty, and staff, as well as community members were invited to the CAAP launch event and asked to provide feedback on CAAP focus areas. At the event, participants were invited to 'vote' on the priority of climate action and climate justice topics using colored stickers representing high, medium, or low priority. Participants could leave additional comments on workshop posters or use the available QR code to complete an online survey (**Figure 7**).

The CAAP Launch event resulted in 20-60 dot votes per topic across all seven boards and 1,800 total dot votes. Additionally, there were 95 total survey responses, of which over half were students (**Figure 8**).

Key Takeaways

The voting exercise and launch survey results provided the following key takeaways from participants:

- Participants identified renewable energy (specifically solar rooftops), green spaces and infrastructure, energy efficiency in buildings, public transportation improvements, and reducing material consumption through reuse, donation, or repair as priority climate mitigation strategies.

- Participants were most concerned about the climate change impacts of extreme heat and wildfires and wanted UCR to prioritize planting more trees to help cool the campus and surrounding neighborhoods as well as using cool walls, cool roofs, and other reflective materials to increase building resilience to extreme heat.

- Participants suggested more alerts on extreme heat days, heat waves, and wildfire smoke days when people should be advised to use caution if participating in sports or exercise outside.

- Participants found the climate justice issues most relevant to UCR and its surrounding communities to be respiratory disease caused by poor air quality and the access and cost of healthy food.

The outcomes of the participant voting conducted through the in-person event and online survey were used to develop an initial climate action list under the priority focus areas.

Figure 7 **CAAP Launch Survey Example Question Responses**

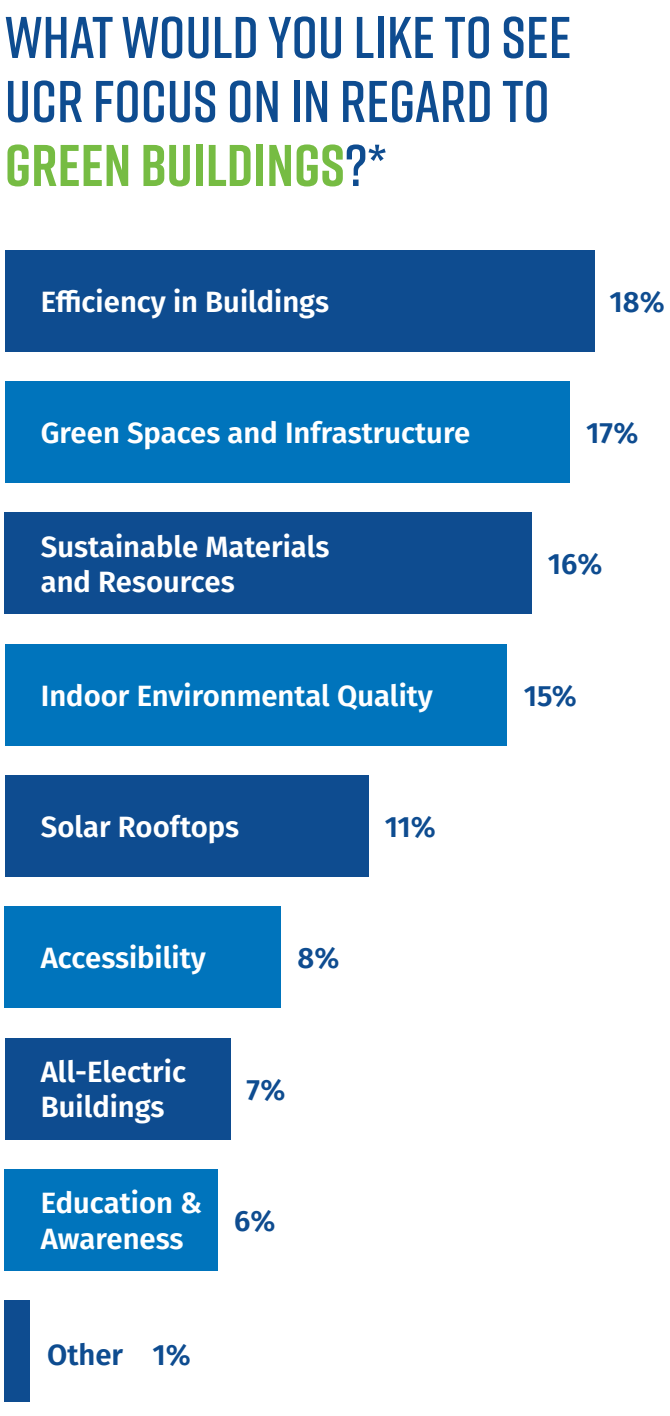
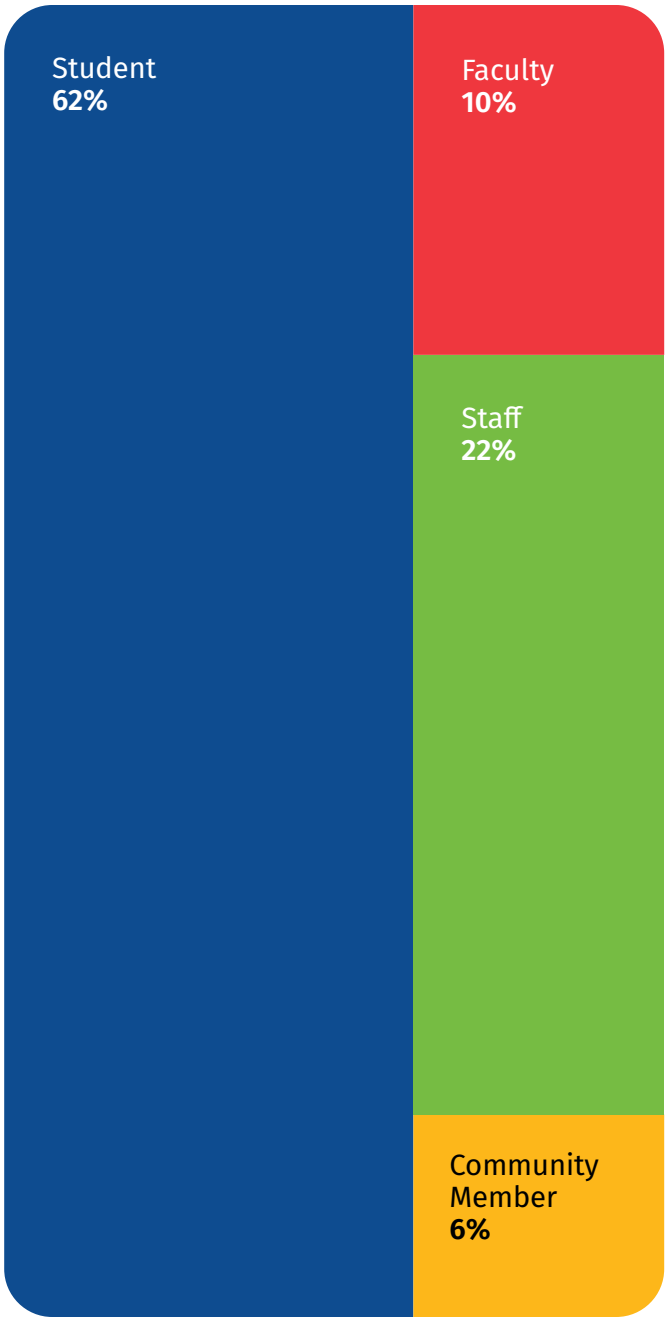


Figure 8 **Breakdown of the 95 CAAP Launch Survey Participants**



* Percent of participant votes (participants could vote for more than one area)

Climate Action Development

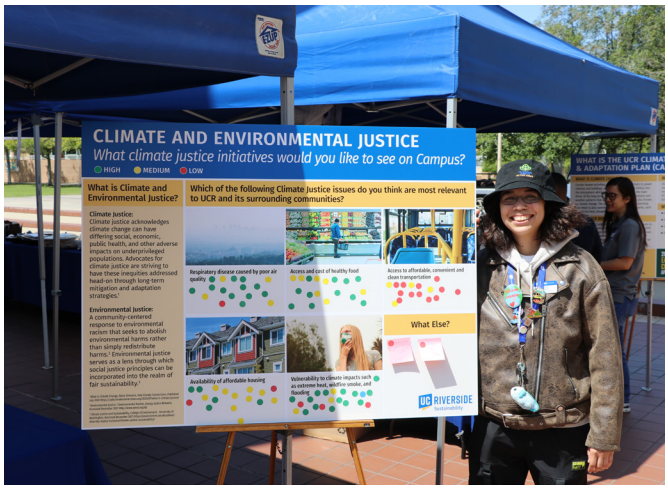
To support action development, workshops were held with ISC3, UCR students, and the Sustainability Committee. The purpose of the workshops was to identify new actions UCR can take to reduce GHG emissions, enhance climate resilience, and advance climate justice. Participants reviewed UCR's existing and planned actions to brainstorm new action ideas, identify implementation leads and potential partners, and note barriers to action implementation. At the end of each workshop, participants were directed to a Climate Action Feedback survey and additional feedback form to provide further information. The Office of Sustainability synthesized action feedback into a final list of draft actions that was sent to stakeholders for final review. The feedback form requested that stakeholders provide additional action edits, identify actions that should be included or excluded from the CAAP, and identify priority actions. The climate action development workshops reached over 40 stakeholders and 12 stakeholders voted on the initial priority actions (results in **Table 4**). Through a collaborative process, the Office of Sustainability; Planning, Design & Construction; Facilities Services; Sustainability Committee; and other stakeholders used the feedback to refine a list of 15 climate actions that would move forward in the action evaluation and prioritization process.

Table 4 Top Priority Actions Voted on by Stakeholders

Action Title*	% of People Who Voted for the Action to be a Priority**
Mobility Study	60%
Micromobility Infrastructure	50%
Regional Connectivity	42%
On-site Renewables	42%
Energy Analysis Systems	33%
Student Commute Survey	33%
R'Garden Program	33%
Tree Planting	33%
Recycled Water Irrigation	33%

Table 5 Top Priority Actions from Prioritization Workshop

#	Action
1	All-Electric Buildings
10	Compost Improvements
11	R'Garden Program
2	Energy Analysis Systems
8	Micromobility Infrastructure***



* Detailed descriptions of the actions were included with the feedback forms

** Participants could vote for more than one action and all other actions not listed here received <25% approval

*** In the CAAP, this action was replaced with Action 7: Micromobility Study as a short-term action

Climate Action Prioritization

The final 15 actions were evaluated for their GHG reduction potential, equity impacts, implementation costs, operational cost savings, public health impacts, and UCR's capacity to implement. Additionally, each action was evaluated for potential environmental justice and climate justice concerns, opportunities to advance equity through the action, and considerations of unintended consequences. Evaluation results were shared with stakeholders during an October workshop where 27 participants discussed their action priorities, potential action disbenefits and risks, ways to mitigate action risks, and voted on the top five priority actions that should be implemented in the next 1-3 years (see **Table 5**). These actions were designated as short-term priorities in the CAAP with the exception of Action 8: Micromobility Infrastructure. Based on feedback from implementation leads, this action was replaced with Action 7: Micromobility Study to better inform the future implementation of Action 8.

Draft CAAP Review

The first draft CAAP was shared with over 100 stakeholders, including students, staff, faculty, and community-based organizations, to collect additional feedback on the plan. These comments were incorporated into the second draft CAAP which was distributed to stakeholders for a final round of comments before the final graphic CAAP was developed.

UCR SUSTAINABILITY STORIES

Ana Hooshyari is a Sociology/Law and Society major with a minor in Environmental Studies. As the Vice President of Sustainability/Director of GCAP, she is motivated by eco-anxiety and a deep concern for the future of ecosystems and the impacts of pollution on communities. Her commitment to climate action focuses on encouraging students to make everyday contributions toward sustainability while also advocating for corporate accountability in addressing environmental harm.

As part of the Eco-Bricking Workshop Series with GCAP, Ana led a hands-on session attended by 10 students. The workshop introduced the benefits of eco-bricking as a method to reduce plastic waste entering oceans and landfills. Students were provided with pre-washed plastic bottles and materials, along with chopsticks to compact the plastic into bottles. Ana offered demonstrations, showing examples of properly completed eco-bricks compared to those less effective or firm. To further encourage participation, students were entered into a raffle for a reusable water bottle and a gift card, awarded to those who created the most eco-bricks by the end of the series.

Ana Hooshyari Far
VP Sustainability/Director of GCAP
Residential Education ARD
Associated Students of University of California, Riverside

Climate actions were evaluated for their GHG emission reduction potential, implementation and operational requirements, and environmental and climate justice implications.

GHG EMISSIONS ANALYSIS

05

GHG Inventory Methodology

GHG inventories quantify an organization's contribution to GHG emissions. Inventories are essential for identifying emission sources, informing reduction strategies, and for tracking progress over time. UC campuses and academic health centers report their emissions annually to UCOP through the Annual Report on Sustainable Practices. These inventories follow The Climate Registry (TCR) General Reporting Protocol (GRP) for GHG accounting.[36]

UCR developed GHG inventories for calendar years 2009 to 2023 using an operational control approach in which it reports GHG emissions from activities where UCR has the full authority to introduce and implement operating policies that can reduce emissions levels.[37] GHG inventories are organized into three emissions scopes to align with tracking and reporting guidance as described in **Table 6**.

To calculate emissions, UCR collects activity data for each emissions source, which is multiplied by a corresponding emissions factor. Calendar year 2019 activity data for each emissions source is provided in **Table 7**.[38] Most emissions factors were sourced from the Environmental Protection Agency's (EPA) 2018 Emissions Factors for Greenhouse Gas Inventories document.[39] In 2019, UCR reported GHG emissions of CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), and hydrochlorofluorocarbons (HCFCs). UCR uses the IPCC's Fifth Assessment Report Global Warming Potentials (GWPs) to convert quantities of these different GHGs into a standardized unit of metric tons of carbon dioxide equivalent ($MTCO_2e$). In UCR's GHG inventories, Scope 2 electricity emissions are reported using the market-based method which uses a specific electricity emissions factor from the primary electric utility, Riverside Public Utilities (RPU).[40] As a part of the CAAP development process, Scope 3 solid waste emissions were added to UCR's original 2019 inventory to comply with the UC Policy requirements.

This chapter presents UCR's GHG emissions inventories and forecasts, which informed the climate action selection process, and also outlines the campus's GHG reduction targets.

Table 6 UCR Emissions Sources

Scope Description	Included in UCR GHG Inventory
Scope 1 Direct anthropogenic GHG emissions	Building and facility fuel use (e.g., natural gas and stationary diesel), campus fleet fuel use, and refrigerant leakage
Scope 2 Indirect anthropogenic GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling (collectively referred to as consumed energy)	Electricity use
Scope 3 All other (non-Scope 2) indirect anthropogenic GHG emissions that are a consequence of campus activities, but occur from sources not owned or controlled by the campus	Commuting fuel use (including students, staff, and faculty),[41] UCR-funded air travel fuel use, and disposal and treatment of solid waste

[36] The Climate Registry. General Reporting Protocol. https://theclimateregistry.org/registries-resources/protocols

[37] Simplified inventories exist for 1990 and 2000.

[38] UC locations are required to use 2019 as their base year for GHG emissions targets as outlined in the UC Policy.

[39] Environmental Protection Agency. 2018. Emission Factors for Greenhouse Gas Inventories. https://www.epa.gov/sites/default/files/2018-03/documents/emission-factors_mar_2018_0.pdf

[40] Though UCR purchases electricity from RPU, Southern California Edison (SCE), and Imperial Irrigation District (IID), SCE and IID electricity use is minor compared to RPU. Therefore, UCR uses RPU's utility-specific electricity emissions factor to calculate campus-wide electricity emissions.

[41] Students are not directly surveyed to determine their commuting emissions – student employees are surveyed on their commute patterns and those results are extrapolated to all students to estimate total student commuting emissions.

Table 7 2019 GHG Emissions Inventory Activity Data and Emissions

	Emission Source		Activity Data
Scope 1	**Natural Gas** MMBTU		464,744
	Stationary Diesel gallons		14,312
	Transportation, Other Fleet Vehicles gallons	Gasoline	136,983
		Diesel	9,261
		CNG	3,425
	Transportation, Vanpool gallons of gasoline		27,780
	Refrigerants Leaked lbs	R-22	307
		R-134A	881
		R-404A	144
		R-407C	178
Scope 2	**Utility Electricity** MWh		114,609
	Electricity Purchased through Power Purchase Agreements MWh		11,089
Scope 3	**Commuting**	Vehicle Miles Traveled	38,853,897
		Gallons of Gasoline	1,942,645
	Air Travel miles		8,194,525
	Solid Waste short tons	Recycling/ Reuse	2,445
		Compost	832
		Landfill	1,420
		Incinerator	423

Inventory Results and Analysis

UCR GHG emissions in 2019 totaled 91,510 $MTCO_2e$, as shown in **Table 8**. Most emissions are from building and facility energy use (76% of total emissions), primarily from Scope 2 electricity (49%) and Scope 1 natural gas (27%) use (**Figure 10**). Electricity is used directly in buildings for cooling, appliances, and lighting, but also to generate chilled water which is then distributed to campus buildings to provide cooling (chilled water serves about 80% of the campus' cooling needs). Most of the natural gas emissions are from the campus owned and operated Central Utility Plant (CUP), which combusts natural gas in boilers to produce and distribute steam for space heating, water heating, and humidification. In any given year, roughly 70-80% of campus natural gas emissions are from the CUP (equating to roughly 70% of total Scope 1 emissions). Natural gas is also used in other boilers, kitchens, laboratories, and heating appliances.[42]

Commuting (19% of total emissions) generates the third largest amount of GHGs and includes students, staff, and faculty who drive to campus. University fleet (2%) emissions are from fleet and vanpool fuel use while air travel (2%) emissions are from university-funded air travel. Refrigerant leakage (1%) emissions are due to the accidental release of refrigerants in cooling systems while solid waste (1%) includes emissions from campus waste that is composted, landfilled, incinerated, or recycled (UCR no longer incinerates any of its solid waste). Stationary diesel (<1%) is used for backup generators and represents the smallest contributor to the campus's overall GHG emissions. Overall, Scope 2 emissions represent the largest contributor to the GHG inventory (49%), followed by Scope 1 (30%) and Scope 3 (21%) sources.

Figure 11 shows UCR's emissions inventories from 2019 to 2023 in which emissions have decreased 10% (the 2020-2023 inventories do not include solid waste emissions, which would most likely increase annual emissions levels by approximately 1%). The 30% decrease in emissions from 2019 to 2021 is a result of Scope 3 commuting emissions being almost entirely reduced due to the COVID-19 pandemic during which the UCR campus was closed. However, commuting emissions rebounded from 2021 to 2022 when the campus re-opened. The majority of 2019 to 2023 emissions reductions are from a decrease in Scope 2 electricity emissions resulting from a combination of reduced campus electricity use and the electric utility (RPU) using more low- or no-emission energy sources.

Additionally, solid waste emissions were only added to the 2019 inventory and not any other previous inventories. However, UCR plans to add solid waste emissions to all inventories once a consistent data collection and analysis method has been determined.

[42] A detailed analysis of building and facility energy use can be found in the 2024 Campus Decarbonization Study: https://sustainability.ucr.edu/ucr-campus-decarbonization-study#deliverable-1

Figure 10 **UCR 2019 GHG Emissions**

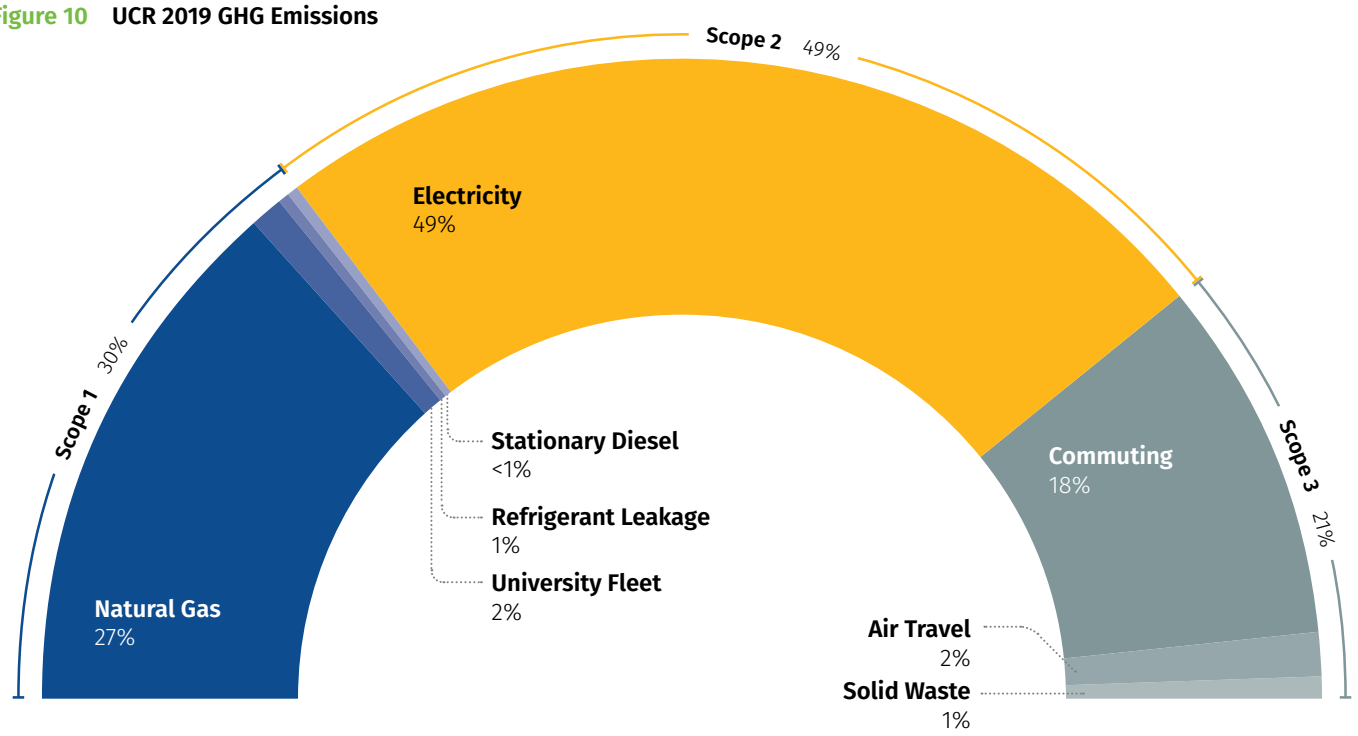
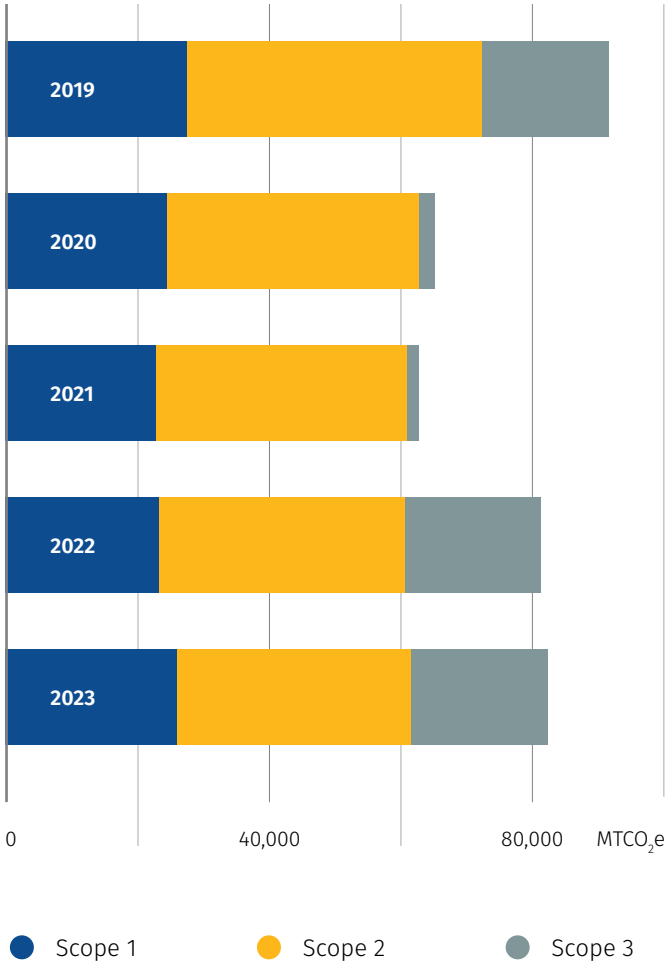


Table 8 **2019 GHG Emissions Source and Scope Summary**

Scope	Source	Emissions $MTCO_2e$
Scope 1	Natural Gas	24,659
	University Fleet	1,588
	Refrigerant Leakage	1,154
	Stationary Diesel	146
	Scope 1 Total	**27,547**
Scope 2	Electricity	44,640
	Scope 2 Total	**44,640**
Scope 3	Commuting	17,033
	Air Travel	1,514
	Solid Waste	776
	Scope 3 Total	**19,323**
	Scopes 1, 2, & 3 Total	**91,510**

Figure 11 **UCR GHG Emissions Inventory**



Forecast Methodology

While a GHG inventory provides a snapshot of GHG emissions, it is important to understand how emissions may change over time to inform target-setting and climate action development. Accurately forecasting GHG emissions is challenging since emissions levels are influenced by myriad factors, so forecasts are meant to provide directional guidance rather than certainty.

UCR emissions were forecast under a scenario that considers how emission levels may change if CAAP actions are not implemented. This scenario considers how campus energy use and emissions factors may change if UCR continues under its projected growth while its emission sources are impacted by both CUP electrification as outlined in the Decarbonization Study and other external factors (e.g., state vehicle fuel efficiency requirements, RPU clean electricity goals, etc.).

In the forecast scenario, 2019 emissions were forecast to 2030, 2035, 2040, and 2045 to align with the reduction target years required by the UC Policy. Growth indicators were used to develop forecasts for each emissions source (**Table 9**).

- Natural gas and electricity forecasts are aligned with those in the UCR Campus Decarbonization Study, which outlays scenarios in which the CUP is transitioned from natural gas to zero-emission operation. The featured scenario includes an electric central hot water plant and replacement of steam building systems with low-temperature hot water. In this scenario, buildings not currently supplied by the CUP (i.e., using standalone natural gas building systems) are assumed to transition to electric equipment at the end of useful life and new buildings will be connected to the CUP.

- UCR vehicle fleet and commuting fuel use was forecast using UCR's Institutional Research (IR) staff and faculty population projections. Future vehicle and fuel types were forecast using the California Air Resources Board (CARB) Emission Factor (EMFAC) tool for Riverside County. EMFAC considers vehicle fuel switching due to state and federal policies, such as Advanced Clean Cars II (ACCII) which requires 35% light-duty ZEV sales in 2026 and 100% in 2035.

- Refrigerant leakage and stationary diesel were forecast using building square footage projections from the UCR Campus Decarbonization Study. Assumptions on switching to low-GWP refrigerants were derived from phase-out requirements from state regulation and research on common low-GWP substitutes.

- Solid waste forecasts were developed from student, staff, and faculty population projections while air travel emissions were forecast using staff and faculty population projections.

Table 9 Emissions Forecast Proxy Growth Indicators and Sources

Source/Factor	Growth Indicators	Source
Natural Gas	Building and facilities square footage projections and CUP electrification	UCR Campus Decarbonization Study
Electricity	Building and facilities square footage projections and CUP electrification	
Stationary Diesel	Building and facilities square footage projections	
Refrigerant Leakage	Building and facilities square footage projections	
Electricity Emissions Factor	RPU electricity emissions factor forecast	RPU Integrated Resource Plan (IRP) Table 16.3.1
Vehicle Fleet Fuel Emissions Factors	Riverside County average vehicle emission factors	CARB EMFAC tool
Commuting Emissions Factors	Riverside County average vehicle emission factors	
Vehicle Fleet Fuel	Staff and faculty population projections	UCR IR Projections to 2045
Commuting Fuel	Staff and faculty population projections	
Air Travel	Staff and faculty population projections	
Solid Waste	Student, staff, and faculty population projections[44]	

[43] Though the Decarbonization Study's main goal was to achieve 90% reduction in scope 1 emissions by 2045, the Decarbonization Study showed that CUP electrification could happen closer to 2040. The GHG emissions forecast were built off this assumption.

[44] The impacts of SB 1383 were not integrated into solid waste forecasts as the potential impact on waste emissions was unclear.

Forecast Results and Analysis

The GHG emissions forecasts show that emissions would decrease 92% by 2045 compared to 2019 levels based on the forecast assumptions (see **Figure 12**). The largest emissions reductions would occur from Scope 2 sources which are eliminated by 2040. The second largest emissions reductions are from Scope 1 sources, which are expected to decrease by 93% from 2019 levels. Scope 3 sources provide the third largest emissions reductions, decreasing 74% from 2019 levels.

Table 10 and **Figure 13** show emissions forecasts by source. For the forecast years, any emissions related to electricity use from vehicles are included in the university fleet or commuting emission sources, not under electricity.

The majority of 2019-2045 emissions reductions are from decreasing Scope 2 electricity and Scope 1 natural gas emissions. Even though campus electricity use is assumed to increase over time, electricity emissions are expected to decrease as RPU increases its use of clean energy sources. Most emissions reductions from 2019-2030 are from RPU reducing its electricity-related emissions. As RPU expects to reach zero-carbon electricity by 2040, projected electricity emissions past 2040 are also zero.

UCR SUSTAINABILITY STORIES

Kevin is an environmental engineering student at UCR. He is the president of the Sustainable UCR Club and a member of the UCR Green Campus Action Plan Policy Team. In these roles, he helps students engage in environmental dialog and facilitates the development of sustainable policies and initiatives across campus. He is also the Bonnie Reiss Leading on Climate Decarbonization Fellow where he works with the Office of Sustainability, university professors, and members of Facilities Services to help implement the Campus Decarbonization Study and identify the optimal pathway for reaching campus emission goals. His biggest motivation in working in sustainability is protecting human lives and preserving biodiversity through the stabilization of the global climate.

Kevin Leung

Bonnie Reiss
Leading on Climate—
Decarbonization Fellow

Figure 12 **UCR Emissions Forecast by Scope with CUP Electrification**

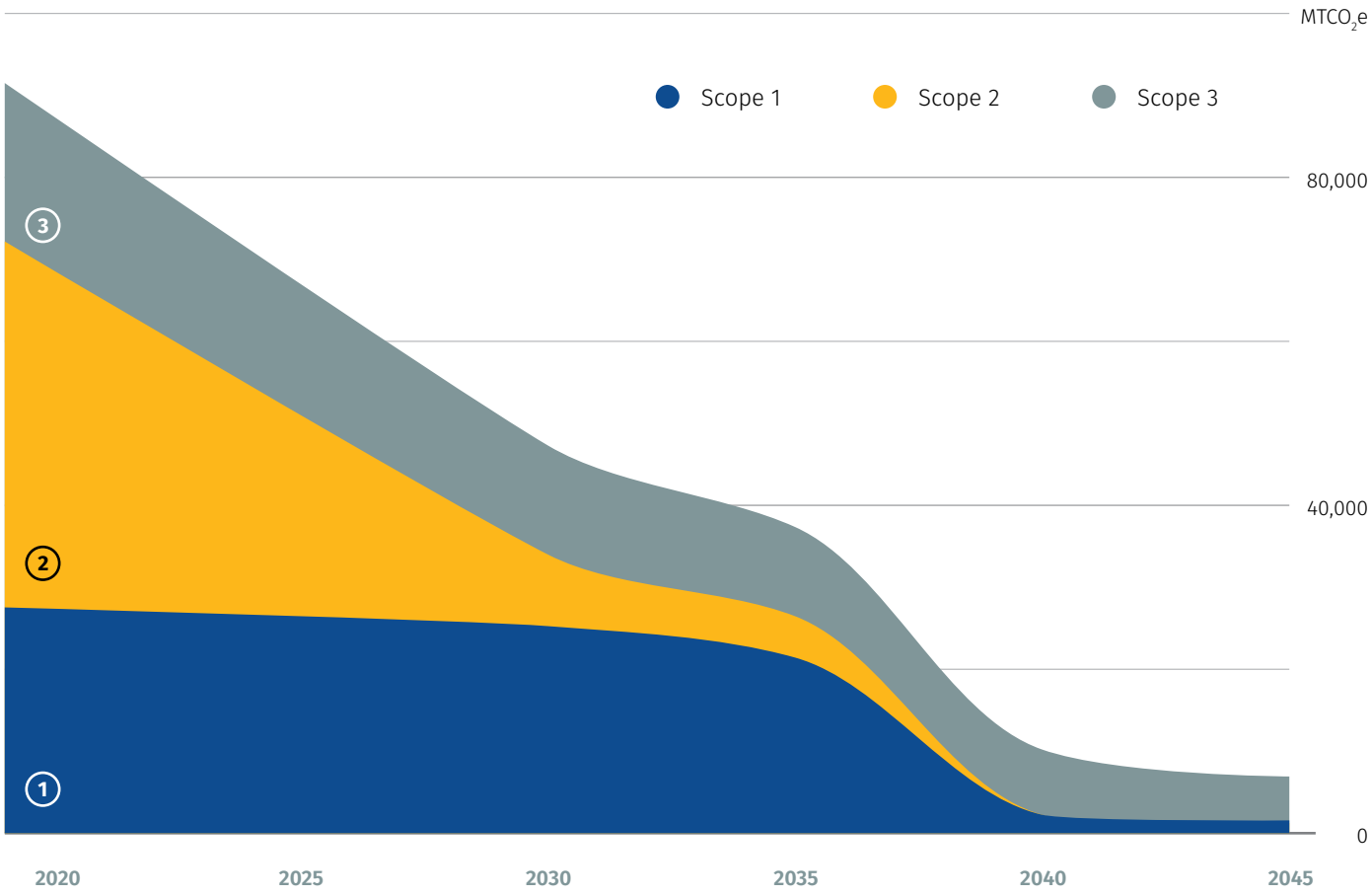


Figure 13
GHG Forecasts with CUP Electrification

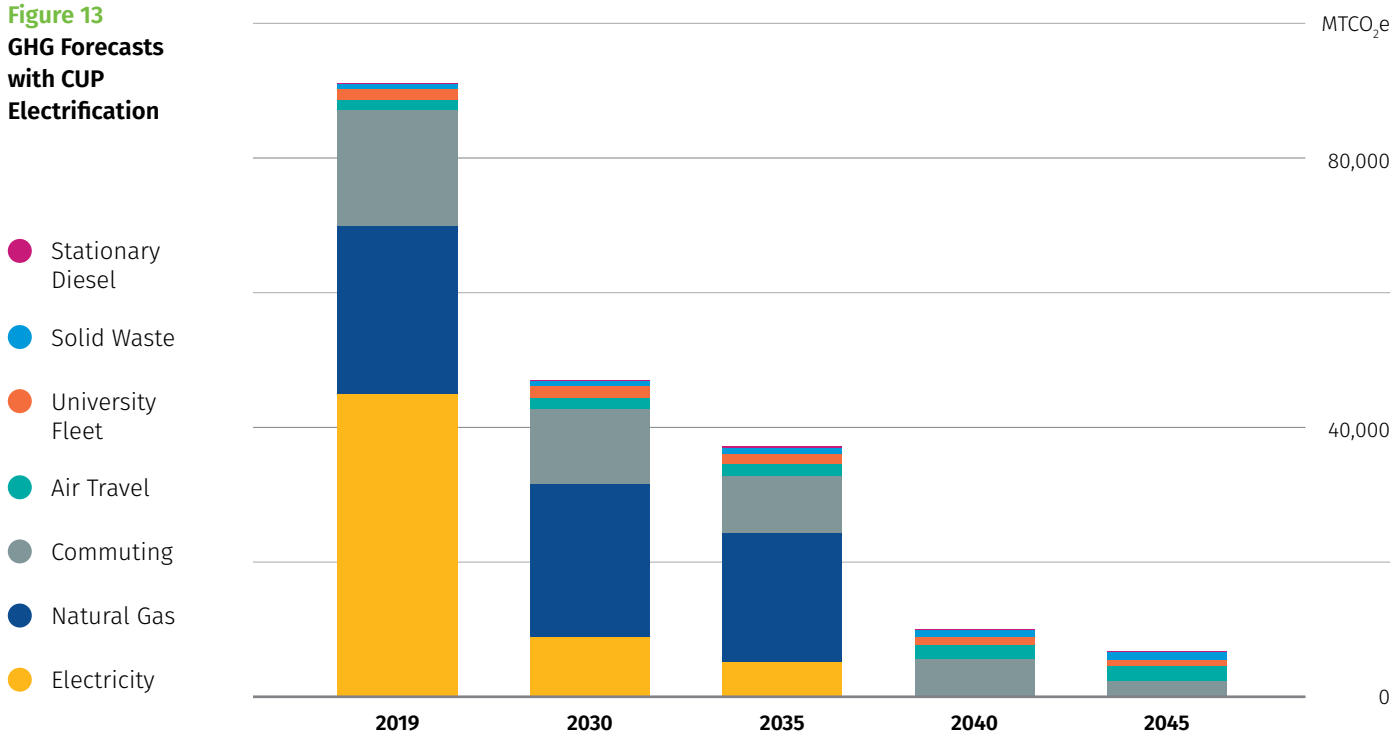
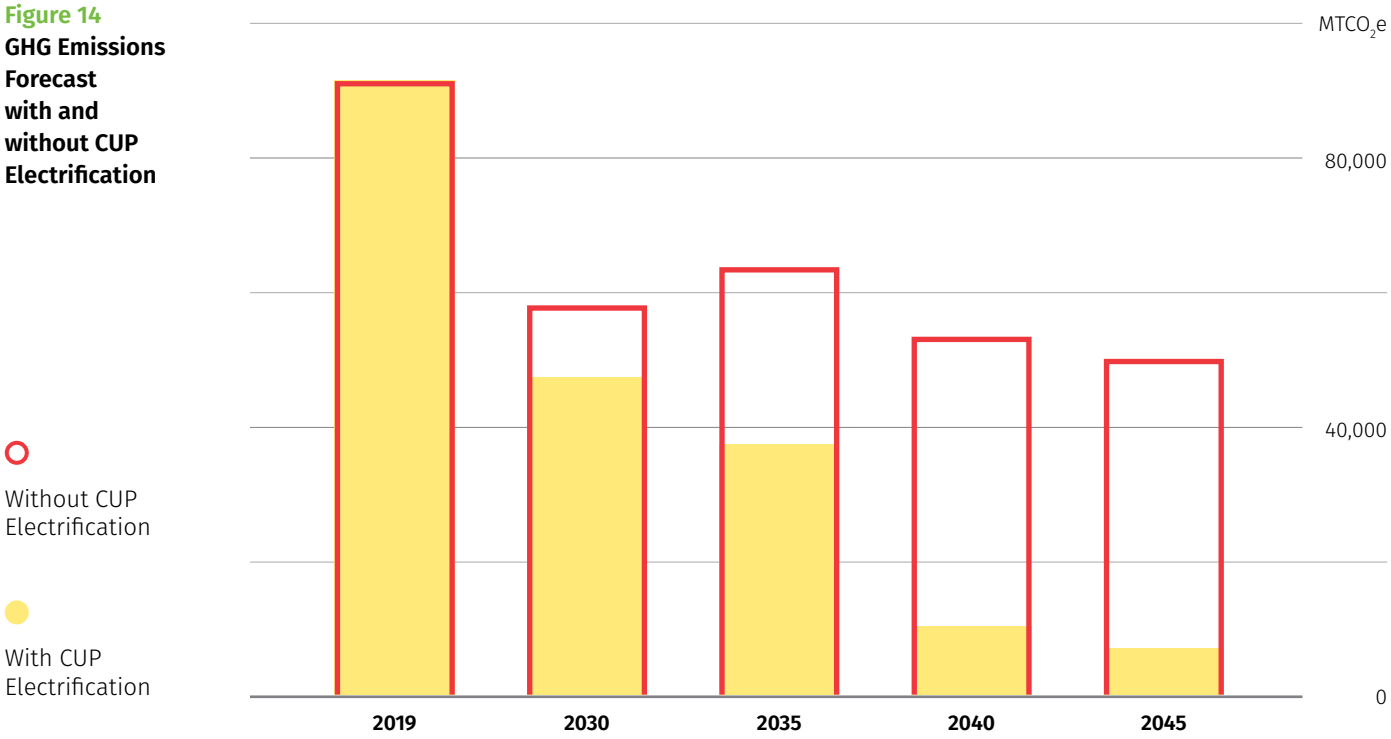


Table 10 **Emissions Forecast with CUP Electrification** $MTCO_2e$

Scope	Source	2019	2030	2035	2040	2045	% Change 2019 – 2045
Scope 1	Natural Gas	24,659	22,465	18,732	0	0	▼ 100%
	University Fleet	1,588	1,646	1,463	1,172	903	▼ 43%
	Refrigerant Leakage	1,154	956	978	837	731	▼ 37%
	Stationary Diesel	146	190	255	255	255	▲ 75%
	Scope 1 Total	**27,547**	**25,258**	**21,428**	**2,264**	**1,889**	**▼ 93%**
Scope 2	Electricity	44,640	8,711	5,046	0	0	▼ 100%
	Scope 2 Total	**44,640**	**8,711**	**5,046**	**0**	**0**	**▼ 100%**
Scope 3	Commuting	17,033	10,857	8,301	5,231	2,145	▼ 87%
	Air Travel	1,514	1,646	1,730	1,819	1,911	▲ 26%
	Solid Waste	776	792	850	912	979	▲ 26%
	Scope 3 Total	**19,323**	**13,295**	**10,881**	**7,961**	**5,035**	**▼ 74%**
	Total with CUP Transition	**91,510**	**47,264**	**37,355**	**10,225**	**6,924**	**▼ 92%**

Figure 14
GHG Emissions Forecast with and without CUP Electrification



The majority of 2019-2045 emissions reductions are from decreasing Scope 2 electricity and Scope 1 natural gas emissions. Even though campus electricity use is assumed to increase over time, electricity emissions are expected to decrease as RPU increases its use of clean energy sources. Most emissions reductions from 2019-2030 are from RPU reducing its electricity-related emissions. As RPU expects to reach zero-emissions electricity by 2040, projected electricity emissions past 2040 are also zero.

Natural gas use is assumed to be fully eliminated by 2040 from CUP electrification and transitioning other natural gas building equipment to electricity. With CUP electrification included, total UCR emissions decrease 92% from 2019-2045. Without CUP electrification, emissions would only decrease 45% as natural gas emissions would continue to grow from 2019 to 2045 (see **Figure 14**). Therefore, CUP electrification is a critical action for UCR to substantially decrease its future emissions levels.

From 2019-2045, commuting and university fleet emissions are reduced by 87% and 43%, respectively. These reductions are driven by fuel switching toward zero-emission vehicles primarily due to the California ACCII mandate. However, as of September 2025, the ACCII program is in a legally contested and politically uncertain state, though it remains technically in effect. In the absence of ACCII, emissions from commuting and the university fleet are still expected to decline over time due to existing regulations and market trends; however, the rate of reduction would likely be slower compared to the trajectory under ACCII. Refrigerant emission reductions are primarily driven by state legislation prohibiting the sale of high-GWP refrigerants. Air travel and solid waste are expected to increase from 2019-2045 as they are based on student, staff, and faculty population growth, while stationary diesel emissions are expected to increase with total campus building square footage.

Overall, UCR's emissions forecasts show substantial emissions reduction potential that can help achieve UCR's GHG reduction targets described in the next section. It is important to note that the estimated emissions reductions are heavily reliant on the CUP electrification project and RPU's clean electricity goals.

UCR SUSTAINABILITY STORIES

Rohan is an Environmental Sciences major and Public Policy minor at UCR. He is a Bonnie Reiss Fellow working on UCR CAAP analysis and implementation. He is motivated by the opportunity to help create equitable and science based solutions to the climate crisis. He plans to utilize his knowledge and skills to support environmental justice initiatives in the Inland Empire and pursue a career in Environmental Law.

Rohan Vig

Leading on Climate Planning/Resilience/ Climate Action Plan Fellow

GHG Reduction Targets

UCR established the CAAP GHG reduction targets shown in Table 11 to align with UC Policy guidance.

The Scope 1 targets are based on the UCR Campus Decarbonization study, which shows that Scope 1 natural gas emissions can be eliminated by 2040, equating to a 90% reduction in total 2019 Scope 1 emissions by 2040. However, as CUP electrification is expected to happen closer to 2040, the 2030 and 2035 Scope 1 interim reduction targets will need to be achieved through other means, such as reducing natural gas demand, increasing building and facility energy efficiency, minimizing refrigerant leakage, reducing fleet travel, or switching to zero-emission vehicles.

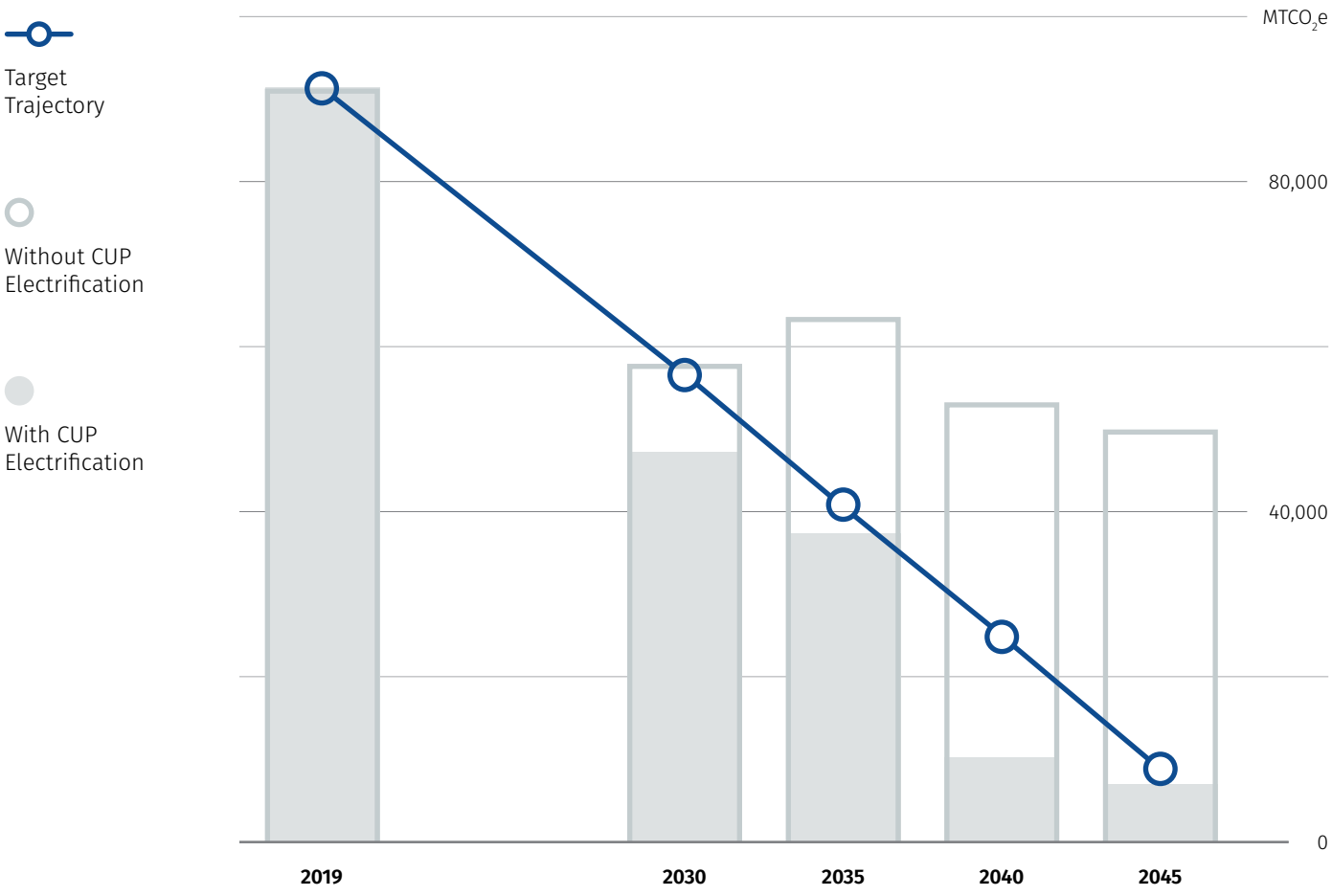
The Scope 3 target is in line with the Scope 3 emissions forecast. This is mainly influenced by ACCII impacts on electrification of commute vehicles. As ACCII is already an aggressive policy in terms of vehicle fuel switching and emissions reductions, it would be difficult for UCR to exceed the Scope 3 emissions forecast, especially as the campus has little influence over commute vehicle types. Therefore, the Scope 3 target is aligned with state legislation and targets.

Table 11 UCR GHG Reduction Targets

Scope	Targets
Scope 1	2030* ▼ 10%
	2035* ▼ 25%
	2040* ▼ 90%
Scope 3	2045* ▼ 75%
Scopes 1, 2, & 3 Total	2045* ▼ 90%
	2045 **Carbon Neutrality** Negate any residual emissions through carbon removal

* Compared to 2019 Levels

Figure 15 UCR GHG Forecast and Target Trajectory



The total Scope 1, 2, and 3 emissions reduction and carbon neutrality targets are mandated through the UC Policy and are consistent with the State of California's climate goals, which include an 85% reduction in GHG emissions below 1990 levels and carbon neutrality by 2045.

In the future, UCR is planning to also set Scope 2 emissions reductions targets and is working closely with RPU to promote the integration of clean electricity sources into the grid.

As shown in the GHG forecasts through 2045, UCR's current target emissions trajectory could meet the 90% emissions reduction target by 2045 (see **Figure 15**). However, achieving the target is highly contingent upon securing funding for CUP electrification, RPU meeting its clean electricity goals, and the implementation of vehicle regulations under ACCII. Additionally, UCR's current emissions trajectory shows the campus would not meet the 2030 and 2035 Scope 1 targets without additional action. Therefore, additional CAAP actions are important to reach the interim targets, provide more certainty on meeting the overall emissions targets, and produce additional benefits to the campus and surrounding community, such as cleaner air and lower transportation costs.

Together, the GHG emissions analysis and subsequent climate risk assessment informed the development of climate mitigation and adaptation actions.

UCR SUSTAINABILITY STORIES

Faith, a native of California's Inland Empire, is deeply committed to conservation, as well as advancing environmental and social justice. She studied Natural Resources at Reedley College and Environmental Planning and Policy at Cal Poly Humboldt to advance climate action at a local level.

Faith's goal is to develop strategies that educate and empower students to advocate for accessible, affordable, and sustainable transportation. She recognizes that higher education institutions, particularly commuter campuses, have the potential to catalyze climate action and promote equitable mobility. Faith works with UCR Transportation Services as the Mobility Program Coordinator where she designs and implements campus-wide outreach campaigns that promote public transit, ridesharing, and active transportation. She collaborates with student organizations, departments, and resource centers across campus to organize public transit field trips that help build confidence among those unfamiliar with public transportation or who rely on alternative transportation options. Her role also includes educating the UCR community about micromobility safety and encouraging sustainable commuting.

Faith McClure
Mobility Program Coordinator,
UCR Transportation Services

Emission-reduction (Scopes 1, 2, and 3) and carbon neutrality targets are mandated by the UC Sustainable Practices Policy and are consistent with the State of California's climate goals.

CLIMATE RISK ASSESSMENT

06

Overview

UCR faces growing climate-related risks that may intensify in frequency and severity, potentially posing significant threats to UCR's physical assets, operations, and community well-being over the next few decades.

Climate hazards are natural events that become more frequent or severe due to changing climate patterns. Local hazard mitigation plans, Cal-Adapt data from California's Fourth Climate Change Assessment, and local disaster reports identify wildfire, extreme heat, and extreme precipitation as UCR's top climate hazards. Although drought does not threaten UCR's physical assets, it is also a top hazard across California and has the potential to affect campus operations. While the UCR and greater Riverside region have strategies in place to adapt to climate impacts, this risk assessment focuses on general impacts from hazard exposure and does not account for adaptive capacity.

Cal-Adapt data from California's Fourth Climate Change Assessment provides future projections for climate hazards at the county level.[46] [47] The climate risk assessment developed for the CAAP had a historical baseline consisting of the observed climate averages from 1961–1990 and represents past conditions that were considered "normal" before significant climate change impacts began. Cal-Adapt uses the Representative Concentration Pathways (RCPs) 4.5 and 8.5, which were developed by the United Nations Intergovernmental Panel on Climate Change (UN IPCC) to model how GHG emissions may evolve under future scenarios, to communicate its climate projections (**Table 12**). The CAAP risk assessment focused on using Cal-Adapt projections based on RCP 8.5, which represents very high global emissions, to evaluate potential climate impacts under a worst-case scenario.

The risk assessment grouped UCR's core physical campus assets into five categories: buildings and facilities, operations and utilities, access (transportation), athletics facilities, and community members (**Table 13**). Refer to Appendix A for additional details on the climate hazard impacts to the UCR campus.

Table 12 A Description of the Two RCPs used in Cal-Adapt

RCP	Description
RCP 4.5	A moderate-emissions scenario where GHG emissions rise until mid-century and then decline to a CO_2 concentration of 550 parts per million (ppm) by 2100.
RCP 8.5	A high-emissions scenario that results in atmospheric CO_2 concentrations exceeding 900 ppm by 2100.

Table 13 UCR Core Asset Categories and Examples

Category	Examples
Buildings and Facilities	Academic and administrative buildings, residence halls, dining facilities, auditoriums, laboratories, libraries, student health, recreation centers
Operations and Utilities	Central Utility Plant, substations, chillers, natural gas boilers, service tunnel distribution system, solar photovoltaic systems, water storage tanks
Access (Transportation)	Campus roads, parking lots/structures, local roads and highways, local public transportation, micromobility, campus assembly areas, footpaths, bike paths
Athletics Facilities	Riverside Sports Complex, Johnson Family Practice Center, Amy S. Harrison Field, Agricultural Operations Course, track stadium, soccer stadium, tennis courts
Community Members	Students, staff, faculty, visitors

[46] "Cal-Adapt." Accessed September 3, 2025. https://cmip5.cal-adapt.org

[47] After careful review of the Cal-Adapt version based on the 5th Climate Change Assessment, the project team chose to use the version based on the Fourth Climate Change Assessment due to data inconsistencies and gaps in the more recent version.

Wildfire

California's dry climate and seasonal rainfall create conditions for wildfires, which can occur year-round even during the winter season, as seen with the Palisades and Eaton Fires in Los Angeles in early 2025. Although fire has historically played a role in California's ecosystem, the state now experiences fires that burn longer and hotter, negatively impacting communities miles away through smoke and poor air quality.[48] [49] At least one large wildfire has occurred in Riverside County each year since 2008.[50] As of August 2025, Riverside County has reported more than 40 wildfire incidents and adjacent San Bernardino County has reported at least 17 wildfire incidents to the California Department of Forestry and Fire Protection (CAL FIRE) since the start of 2025.[51] Several recent wildfire events in proximity to UCR include small brush fires in Box Springs Mountain Reserve in May and June of 2025 (seven acres burned), Hawarden Fire in July 2024 (588 acres burned), Rabbit Fire in July 2023 (8,355 acres burned), and the Sycamore Canyon Park fire in July 2019 (250 acres burned).[52] [53] [54] [55] [56]

Risk Exposure

Future fire events are anticipated to occur more frequently on the western side of the county, where UCR is located. UCR is positioned between several nature reserves: the eastern side of campus abuts Box Springs Mountain Reserve,[57] Live Oak Canyon lies farther to the east and Sycamore Canyon Park lies to the south. This suggests UCR may face higher risk from wildfire compared to other urbanized areas in the City of Riverside, especially as hotter and drier weather creates fire-prone conditions in the surrounding nature reserves.

CAL FIRE and the State Fire Marshal use Fire Hazard Severity Zones (FHSZ) to classify the severity of fire across California. As shown in **Figure 16**, UCR falls into moderate, high, and very high FHSZs, indicating that fire is a key hazard for the campus.[58]

Future Impacts to Assets

A wildfire event that breaches campus grounds can significantly affect community members, operations, and physical assets. Community members will be exposed to hazardous, smoky air quality conditions and will be under evacuation events, which can be particularly stressful for students who do not have the means of transportation to evacuate or students who live on campus and must rely on the university for housing and meals. Several major roads serve as access points for campus, and Interstate 215 is the main highway that allows access to the greater Riverside region. Despite several evacuation options, high-traffic conditions are likely to still occur and limit emergency response to an on-campus fire incident. UCR's buildings and facilities may be directly damaged, experiencing burns, melting, cracking, water damage, and chemical contamination that affect exteriors and interiors. Buildings of more critical nature may include student dormitories, libraries, and research laboratories. The unpredictable nature of wildfire spread means that buildings impacted may be centralized in one area or found in different areas of campus. Athletics facilities also face similar direct damage to buildings. Burning physical assets can also release hazardous chemicals into the air—from building materials, research laboratory chemicals, or peat turf—as a secondary impact.

Regional wildfire events can also pose negative impacts to UCR. Smoky conditions are a health hazard and may disrupt day-to-day life for community members, especially those with sensitivity to air quality and pre-existing respiratory conditions. Additional chemicals released from burned materials and flame retardants used in firefighting also further pollute the air. Ash from fires may settle on buildings and athletics facilities, requiring management plans for cleanup. Preventative measures during wildfire-prone weather conditions may also impact campus energy supply through utility shut-offs. Local firefighting operations and power shut-offs may also strain campus water resources through reduced water pressure. Damaged water infrastructure, flame retardant use, and toxic run-off could also negatively impact drinking water quality due to the presence of volatile organic compounds, heavy metals, and other contaminants.[59] [60]

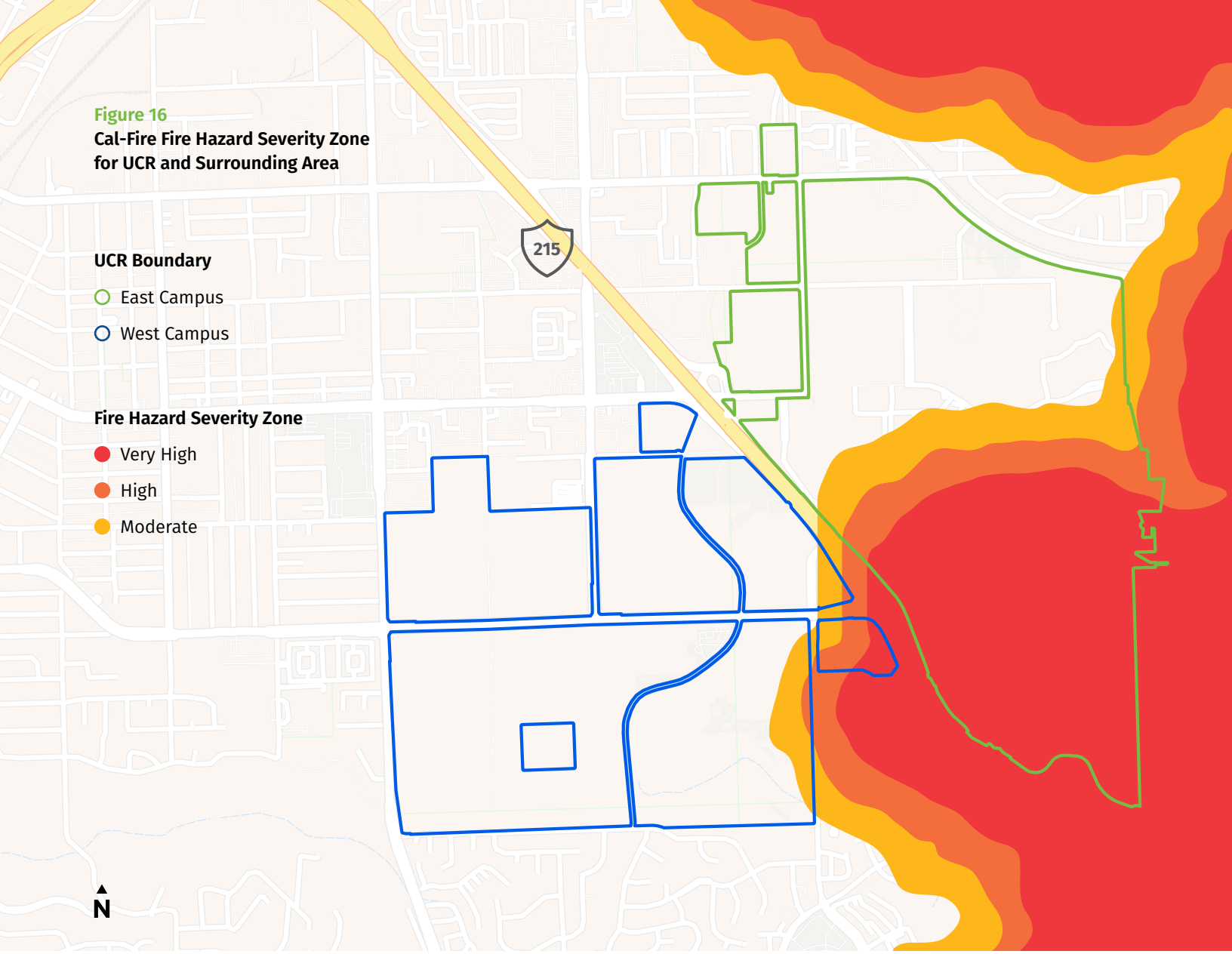


Figure 16
Cal-Fire Fire Hazard Severity Zone for UCR and Surrounding Area

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50 County of Riverside Emergency Management Department. "County of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan." April 2023. https://rivcoready.org/about-emd/plans/local-hazard-mitigation-plan

51 CAL FIRE. "2025 Fire Season Incident Archive." Accessed August 28, 2025. https://www.fire.ca.gov/incidents/2025

52 "Fire Chars Several Acres of Box Springs Mountain Reserve Park." MyNewsLA.Com, May 30, 2025. https://mynewsla.com/business/2025/05/30/fire-chars-several-acres-in-preserve-on-east-end-of-riverside

53 "Blaze Erupts Near Box Springs Mountain Reserve." MyNewsLA.Com, June 10, 2025. https://mynewsla.com/business/2025/06/10/blaze-erupts-near-box-springs-mountain-reserve

54 CAL FIRE. "Hawarden Fire." Accessed September 30, 2025. https://www.fire.ca.gov/incidents/2024/7/21/hawarden-fire

55 CAL FIRE. "Rabbit Fire." Accessed August 22, 2025. https://www.fire.ca.gov/incidents/2023/7/14/rabbit-fire

56 City of Riverside. "Sycamore Canyon Fire." Accessed August 27, 2025. https://riversideca.gov/fire/incident/sycamore-canyon-fire

57 Riverside County Regional Park and Open-Space District. "Box Springs Mountain Reserve." Accessed August 20, 2025. https://rivcoparks.org/open-space-areas-and-reserves/box-springs-mountain-reserve

58 California Office of the State Fire Marshal. "Fire Hazard Severity Zones." Accessed August 19, 2025. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

59 "2025 Los Angeles Wildfire Recovery | California State Water Resources Control Board." Accessed August 21, 2025. https://www.waterboards.ca.gov/water_issues/programs/emp/wildfire_recovery

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Extreme Heat

Extreme heat days are unusually hot days relative to the region's historic average, and Riverside's threshold temperature for extreme heat days is 103.6°F. Heat waves are common in Riverside, and heat alerts are provided by the National Weather Service in San Diego.[61]

Extreme heat events have negative implications for both human health—dehydration, heat stroke, heat exhaustion, cramps, burns, respiratory issues—and infrastructure.[62] Riverside County recorded more than 1,600 emergency department visits and 65 deaths due to heat-related illness in 2024.[63] Between August 17-23, 2025, Riverside County Emergency Medical Services responded to more than 60 heat-related incidents and indicated an increase in emergency calls during a week where an extreme heat watch was in effect for several days.[64] [65]

Risk Exposure

Climate models project UCR's historic average of 4 extreme heat days per year is forecasted to increase to 27 days annually by mid-century (2035-2064) and 48 days by end-of-century (2064-2100). Additionally, warm nights (those that stay above 67.7°F) are projected to increase from 6 warm nights each year to 36 nights by mid-century and 68 nights by end-of-century.

Future Impacts to Assets

Extreme heat events will increase the demand for cooling and building air conditioning systems may be inadequately sized for increasingly hotter days and nights, creating uncomfortable conditions for building occupants. Community members may suffer from negative health impacts, experience disruptions in daily routines and learning if indoor temperatures are elevated.[66] High outdoor temperatures are also linked to poorer air quality conditions, reduced productivity, and dangerous working conditions.[67] [68] Campus activities, such as outdoor sports and other events, may be postponed or cancelled. Campus access may be limited for public and active transportation users who face exerting themselves under high temperatures and transportation delays.[69] Athletics facilities may experience accelerated wear, such as soil compaction and drying, volatile organic compound release, and cracking. Similarly, building materials can crack, corrode, weaken, and expand under high temperatures.[70] Damages to physical assets will likely result in high costs for repairs and maintenance. Furthermore, rotating outages to conserve energy may impact campus operations.[71] [72] Finally, regional resource constraints and higher cooling needs could result in higher energy costs for UCR.

UCR SUSTAINABILITY STORIES

Kashish is a fourth-year Political Science and Statistics student at UCR. Her student engagement program is part of the Bonnie Reiss Leading on Climate Fellowship, supported by the UC Office of the President. As the Student Engagement Fellow, Kashish serves as a liaison between students and the administration. Her responsibilities include conducting a student survey to assess awareness of UCR's climate and sustainability initiatives, as well as organizing events during Earth Month focused on sustainable habits, such as thrift events, food composting workshops, and creative ways to repurpose waste. In this role, she combines her passions for social justice, climate activism, and data analysis to provide a comprehensive perspective on UCR's sustainability efforts. Her motivation to engage in climate adaptation projects stems from a desire to address both personal and collective climate anxiety, while also demonstrating practical ways to participate in community sustainability.

Kashish Rai

Bonnie Reiss Leading on Climate Fellow—Engagement

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[70] EarthScan. "How Heatwaves Impact Infrastructures and Ecosystems." Accessed August 21, 2025. https://www.earth-scan.com/blog/heatwaves-impact

[71] "UC Riverside Sustainability Annual Report 2022." University of California, n.d. Accessed August 27, 2025. https://sustainabilityreport.ucop.edu/2022/locations/uc-riverside

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Extreme Precipitation and Flooding

Extreme precipitation occurs when a region receives significantly more rain or snow in a short period of time than usual. For California—and the Riverside region—atmospheric rivers are intense precipitation events that can replenish water supplies during the rainy season between November and March.[73] Extreme precipitation can bring other storm-related hazards like landslides, strong winds, lightning—and flooding. Flooding occurs when there is an excess of water on normally dry land—not just near rivers and lakes.[74] For example, flash floods often occur during heavy rain due to fast-moving run-off. Areas that are low-lying, impermeable, or poorly draining may be more prone to flooding.[75] Climate change increases the risk of flooding in California, as prolonged drought reduces the soil's ability to absorb water, warmer atmospheres hold more water vapor for precipitation, and shifting weather patterns can result in more extreme storms.[76]

Flash flooding is a common problem in Riverside County. Several notable events in the past have included Tropical Storm Hillary in 2023, which resulted in downed trees and road flooding in the City of Riverside. Tropical Storm Norbert in 2014 flooded four UCR campus buildings including the Rivera library, which required the evacuation of many books, and science buildings, which required wet carpet and drywall renovation following the storm.[77]

Risk Exposure

UCR sits within the University Arroyo watershed and on a complex drainage system.[78] Water flow stemming from Box Springs Mountain reserve, adjacent residential neighborhoods, and the campus itself may contribute to flooding during extreme precipitation events. As depicted in **Figure 17**, University Wash has been designated as a 1% chance annual flood area, which means it has a one percent chance of experiencing a flood each year and is also referred to as the "100-year floodplain".[79]

UCR historically experiences an average maximum of 1.17 inches of precipitation per day. This is projected to increase to 1.27 inches per day by mid-century, and 1.33 inches per day by end-of-century. Although precipitation is not projected to change significantly, California will likely see fewer, but more intense storms within a shorter wet season. This underscores the importance of preparing for precipitation changes at UCR.

Future Impacts to Assets

Extreme precipitation events may cause flooding across buildings and facilities, potentially damaging electrical equipment, utility equipment, and causing elevators or automatic doors to malfunction. Strong winds may damage building roofs, windows, and walls by sheer force or projectiles. Both flooding and wind may result in high remediation and repair costs across affected buildings. Similarly for athletics facilities, more impermeable surfaces such as running tracks and tennis courts may flood more frequently and impact practice schedules and sporting events, and debris will require management plans and additional labor to clear. Intense storms may impact operations and utilities through downed power lines and outages, backflow issues from a sewage system that is at capacity, and flood warnings that discourage non-essential travel and shift classes online for students and faculty.

Although students and faculty may have the option to shift classes online, essential campus staff may still be required to work on campus. Localized flooding may impede access to campus, particularly for those who rely on public or active transportation. On-campus flooding in parking lots and sidewalks may further reduce access for disabled community members. Flash flooding, which can occur with little warning, may pose an immediate drowning risk to individuals as well as secondary health impacts from contact with polluted water. Flooding may also damage cars, bikes, and other personal possessions, leading to financial strain or emotional distress for community members.

[73] State of California Office of Environmental Health Hazard Assessment. "Precipitation." Text. July 28, 2022. https://oehha.ca.gov/climate-change/epic-2022/changes-climate/precipitation

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[79] FEMA. "Flood Maps." Accessed August 19, 2025. https://www.fema.gov/flood-maps

Figure 17
Map of UCR against FEMA's 1% Annual Chance Flood Hazard Zones

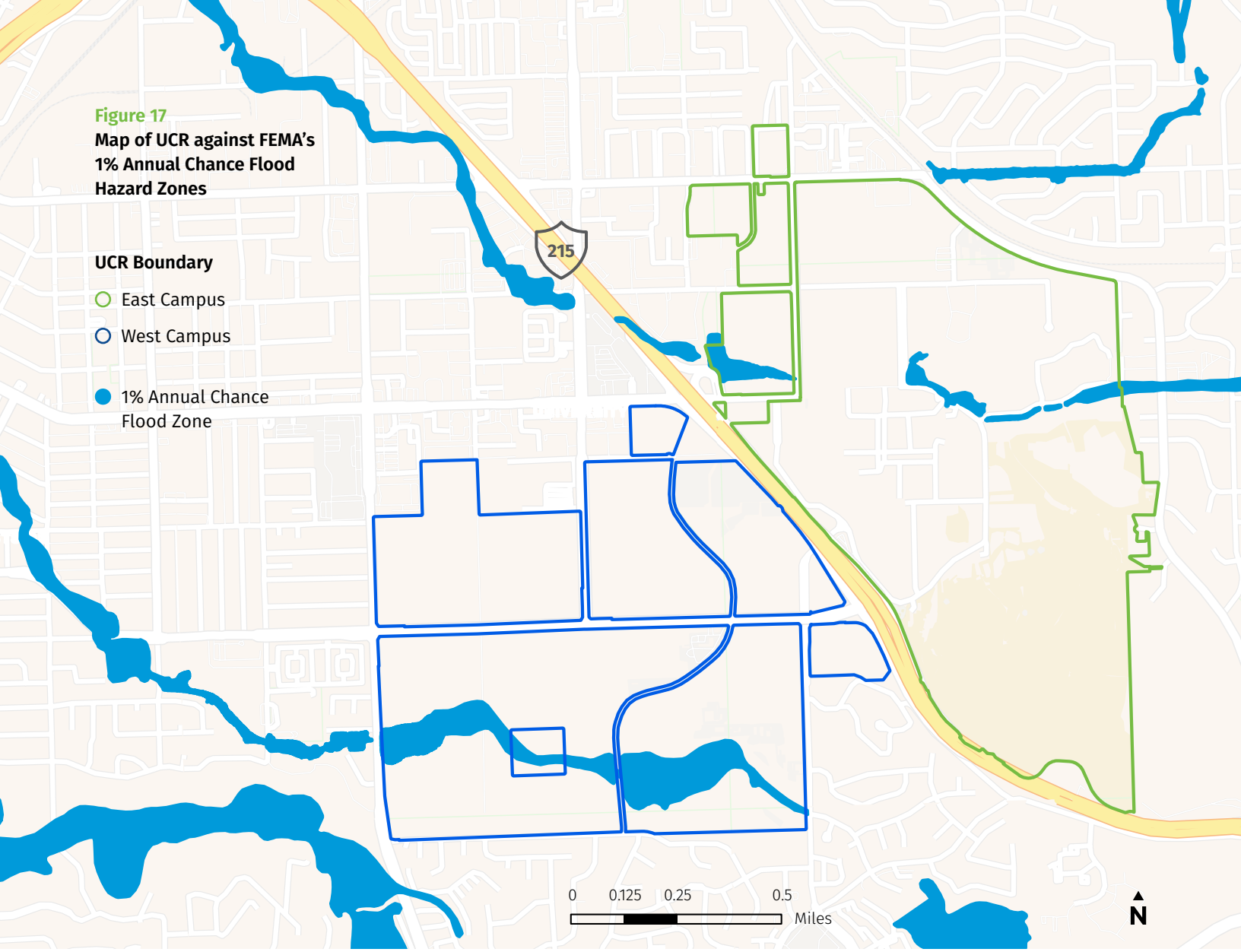
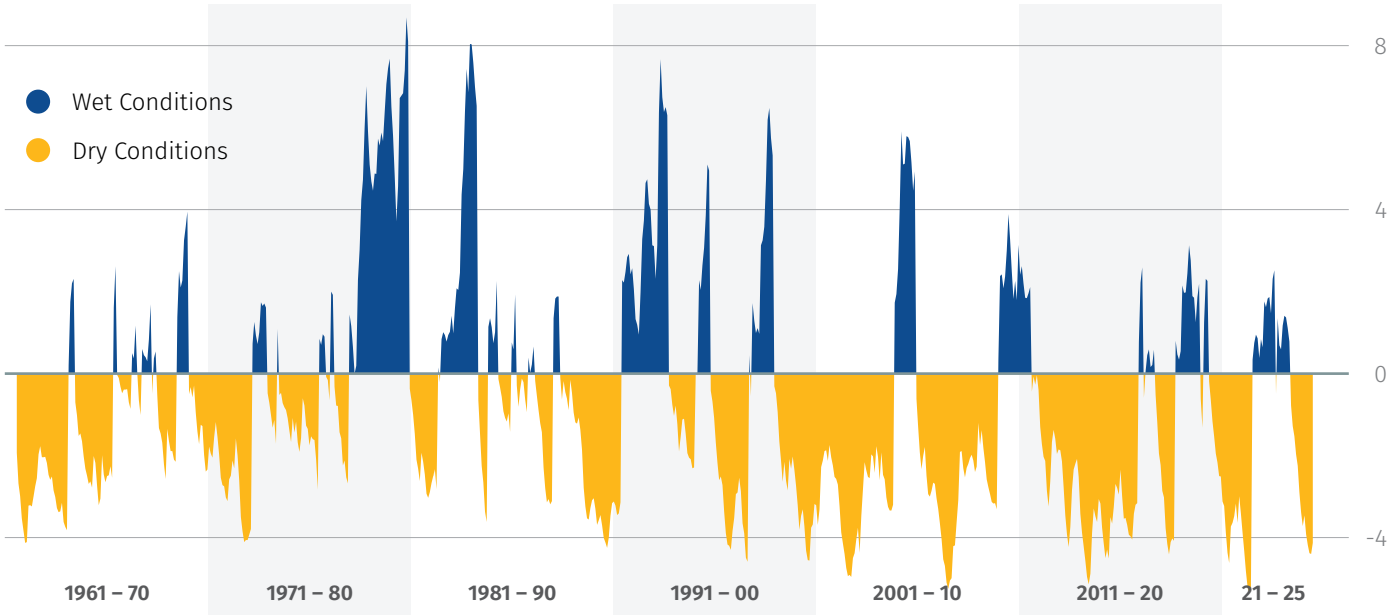


Figure 18 **Riverside County Palmer Drought Severity Index Timeseries**



Drought

Drought is a phenomenon that occurs slowly over time where a deficiency in precipitation and other hydrologic conditions create drier-than-normal conditions. Drought can lead to water shortages, affect quality of life, and increase wildfire risk due to drier ecosystems. Climate change contributes to more frequent and intense droughts because higher temperatures accelerate evaporation from soil and vegetation.[80]

California frequently experiences drought, with several recent events occurring between 2012-2016, 2007-2009, and 1987-1992. As seen in **Figure 18**, Riverside County has experienced longer cycles of drought since the baseline period of 1961-1990.[81] It is important to note that Riverside County includes desert regions such as Palm Springs, which makes county-level data less accurate compared to UCR's location and geography. In addition, because drought does not occur as a localized event, this assessment does not include UCR-specific risk exposure analysis and the consequences of drought are discussed more broadly than other hazards.

Future Impacts to Assets

UCR's location in Southern California—combined with the region's history of drought and rising temperatures driven by climate change—makes future droughts highly likely. The City of Riverside supplies all of its water from groundwater aquifers in the San Bernardino, Bunker Hill, and Riverside basins.[82] The City of Riverside also receives some water from the Metropolitan Water District and Western Municipal Water District, which source water from the Colorado River and Sacramento-San Joaquin Bay-Delta, respectively.[83] While UCR's water supply may be more secure due to various water supply sources, drought conditions may lead to higher utility bills that can impact UCR fiscally.

Drought can have physical impacts on campus landscaping and botanic gardens, in particular, campus trees. Drought places trees under stress, weakening their root systems and decreasing overall tree health, which may lead to trees falling onto buildings or people. Trees in shallow soil or trees with shallow root systems are more susceptible to drought stress.[84] Although the toppling of a tree on campus in September 2025 was not related to drought, a prolonged drought may require more stringent campus tree management and inventory.[85]

The University of California has also set policy goals relating to water use, aiming to reduce growth-adjusted potable water consumption by 36 percent by 2025 compared to a 2005-2008 baseline average.[86] With an on-campus student population, utility services, landscaping, agricultural research operations, and athletics facilities, UCR's substantial water use may require operational changes in order to align with future sustainable water use goals from the University of California.

Conclusion

UCR's geographic location, nature of operations, and community demographics are factors in its overall climate risks. These impacts are projected to increase as climate change increases the severity of hazards. Some impacts are localized, such as very hot days that affect day-to-day routines and strain campus cooling capabilities. Other impacts are from more distant climate events like a wildfire in Los Angeles County that reduces campus air quality or statewide drought that triggers water use reductions. The CAAP risk assessment provides a foundation for future analysis, prioritization, and implementation of the plan's adaptation strategies to strengthen UCR's resilience to both acute and chronic climate events.

UCR SUSTAINABILITY STORIES

Emily is a UCR alumna, where she earned her B.A. in Education, Society, and Human Development. She has a passion for educating the next generations through creative and non-traditional learning environments. As the CCAC EcoHighlander fellow, she facilitates workshops and initiatives within campus residential life that promote sustainability. Her commitment to climate action stems from a belief that serving one's community requires being informed about both current and future plans to improve local systems. By engaging in various projects and programs, Emily continues to find meaningful ways to contribute to climate action.

Emily Macias

EcoHighlander Fellow,
California Climate Action Corps

[80] California Department of Water Resources. "Drought." June 9, 2025. https://water.ca.gov/Water-Basics/Drought

[81] National Centers for Environmental Information (NCEI). "Climate at a Glance | County Time Series." Accessed August 29, 2025. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/CA-065/pdsi/1/0/1961-2025

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CLIMATE ACTIONS

07

This chapter describes the CAAP action development, evaluation, and prioritization process and provides detailed information on each action. The Office of Sustainability is charged with implementing the actions in collaboration with Facilities Services; Planning, Design & Construction; and other campus and community partners as resources become available.

Action Development

Climate actions are discrete programs, policies, or projects that can reduce GHG emissions and/or address climate hazards. UCR developed the CAAP climate actions through the following steps:

1 Baseline Assessment and Gap Analysis
Reviewed UCR's existing and planned climate actions along with city, regional, state, and federal actions that impact UCR's emissions and mapped actions to the emissions source and/or local climate hazard addressed. Conducted a gaps analysis to determine where new or more aggressive action is needed to support decarbonization and/or resiliency. Reviewed UC commitments, UC Policy Goals, UCR Campus Decarbonization Study, UCR surveys[87], and other university best practices to develop new action ideas.

2 Initial Stakeholder Engagement
Conducted a CAAP Launch Event and distributed a survey to identify priority action areas and gather new action ideas. Conducted action development workshops to understand what actions have been implemented, action successes and failures, and ideal future actions.

3 Draft Climate Actions
Consolidated stakeholder feedback to draft 40 new actions and requested additional stakeholder feedback on action edits and priority actions. Conducted EJCJ screening of actions (e.g., identified opportunities to address disparities, potential unanticipated outcomes that worsen inequities, and opportunities to improve equity outcomes). The Office of Sustainability; Planning, Design & Construction; Facilities Services; Sustainability Committee; and other stakeholders selected 15 actions to move forward with action evaluation and prioritization. Selection process considered stakeholder feedback, GHG mitigation potential, climate adaptation potential, cost implications, and alignment with the UC Sustainability Practices Policy. Selected actions also balanced impacts across campus organizations, departments, colleges, and schools.

> The Office of Sustainability is charged with leading implementation of these climate actions in collaboration with Facilities Services, Planning, Design & Construction, and other campus and community partners.

4 Action Analysis and Prioritization
Evaluated actions for GHG reduction potential, equity impacts, implementation costs, operational cost savings, public health impacts, and UCR's internal capacity to implement.[88] Shared action evaluation results with stakeholders and conducted a stakeholder workshop to determine short-term action priorities. Using stakeholder feedback, selected five short-term priority actions for the CAAP.

While this CAAP focused on evaluating 15 actions in detail, 25 other potential actions were identified during the action development process. These actions are presented in the Other CAAP Actions section and can serve as a starting point for new action ideas during CAAP updates or regular implementation progress tracking. Even though CUP electrification is not listed as a new CAAP action, the CAAP builds on the assumption that electrification of the CUP is already underway and identifies new actions to fill the GHG reduction gaps. See the UCR Decarbonization Study for further information on this process.[89]

[87] Including: Christine Seaman. 2025. Climate Resilience Survey. University of California Office of the President Bonnie Reiss Climate Action Fellowship Program.

[88] The avoided social cost of carbon (SCC), or the monetary value of the long-term economic damages caused by emitting one additional ton of CO_2 into the atmosphere, was not included in the CAAP action evaluation process. The avoided SCC was assessed for CUP electrification in the UCR Campus Decarbonization Study.

[89] AECOM. Oct. 2024. "UCR Campus Decarbonization Study". https://sustainability.ucr.edu/sites/default/files/2025-05/ucr-campus-decarbonization-study-final-nov-24_0.pdf

Action Evaluation and Prioritization

Because UCR has limited time, staff capacity, and resources to implement the wide variety of climate actions available, action evaluation and prioritization is a crucial step in creating an implementable and effective CAAP. To support a transparent and efficient prioritization process, a defined set of criteria is applied to holistically evaluate each action based on its anticipated benefits and overall feasibility.

Beyond the primary criteria of GHG emissions reduction, climate actions often provide additional benefits that may not be accounted for in a typical GHG analysis. For example, actions designed to address climate change can also improve local air quality, provide monetary savings, and address regional inequities. Additionally, an entity's capacity to implement the actions will vary in terms of staff capacity and funding. Assessing the impact of actions, whether positive or negative, against a customized set of evaluation criteria helps ensure UCR's key concerns are considered during the prioritization process. Additionally, the UC Policy notes that climate action plans should evaluate a broad range of climate solutions and prioritize selected actions based on cost-effectiveness and climate justice considerations in addition to other local priorities.

The CAAP actions were evaluated for their impact on the six evaluation criteria listed in **Table 14**. While the UC Policy requires evaluation of GHG reduction potential, implementation cost, and equity impacts, UCR selected three additional criteria—cost savings, public health benefits, and implementation capacity—as they best reflect campus priorities and can inform institutional decision-making.

The results of the evaluation process were used by stakeholders to prioritize short-term actions during an action prioritization workshop (see Campus and Community Engagement and Education section for more information on the workshop). This informed the selection of the five short-term actions that will serve as UCR implementation priorities over the next three years (see the Engagement Activities section for more information). All action evaluation results and priority levels are included in the CAAP Action Tables section while descriptions of the evaluation criteria and rating process are in the following sections.

Table 14 Evaluation Criteria

Criteria	Definition
GHG Reduction Potential	What is the GHG reduction potential of the action?
UCR Cost to Implement	What are UCR's upfront costs to implement the action (not accounting for operations/maintenance costs)?
UCR Cost Savings	Does the action provide operational cost savings to UCR?
UCR Capacity to Implement	What is UCR's current capacity to implement the action in terms of available staff and funding?
Equity Impact	What is the action's potential to advance climate or environmental justice?
Public Health Impact	What is the action's impact on physical, mental, and social well-being?

GHG Reduction Potential

The initial step in assessing an action's GHG reduction potential is to identify each action's GHG reduction type. For example, does the action directly reduce emissions, such as planting trees? Does the action serve as a key step to enable more direct action, such as conducting a micromobility study? Or does the action support emissions reductions indirectly such as a campus sustainability campaign?

The second step is to quantify the potential range of GHG reductions the action could result in.

Certain actions were grouped together to evaluate their combined GHG reduction potential, as disaggregating the emissions impact of similar and/or overlapping actions is challenging. Additionally, the GHG reductions of some actions were not quantified as their impact was difficult to assess. However, these actions enable or support GHG reductions and are still important to consider during prioritization. Other GHG reduction considerations include the following:

- In order to better understand the actions' maximum reduction potential, the GHG reduction estimates assume that the CUP electrification and new construction electrification reflected in the emissions forecast do not occur.
- The GHG reduction potential of the transportation-related actions is based on the assumption that ACCII is implemented. As a result, these actions yield lower incremental GHG reductions, given that the emissions forecasts already account for high levels of EV adoption.
- The emissions forecast assumes that electricity generation will be carbon-free by 2045; therefore, actions aimed at reducing electricity consumption in that year are not expected to yield additional GHG reductions.

Implementation Cost

Implementation costs for the actions include upfront capital expenditures and expenses associated with hiring additional staff or consultants. However, ongoing operational and maintenance costs are not accounted for in this assessment. Actions with higher costs typically include physical infrastructure installations, such as micromobility infrastructure and tree planting actions.

Cost Savings

Cost savings to UCR were qualitatively assessed and reflect operational or maintenance cost savings provided by the actions.

Cost savings ratings are presented on a relative scale. An action rated as having high cost savings indicates it offers some of the greatest savings compared to other CAAP actions, although specific savings amounts were not quantified. Additionally, certain actions may increase costs for UCR if they introduce new operational or maintenance activities that were not previously required. Certain actions were grouped together to evaluate their combined impact in order to align with the GHG reduction potential impact rating.

Public Health Impacts

Public health impacts were qualitatively assessed and reflect physical, mental, and social benefits provided by the actions. The public health ratings are relative to each other. Therefore, an action with a high public health means it produces some of the highest benefits compared to the other CAAP actions.

Actions that reduce fuel combustion, such as the building energy and transportation actions, reduce air pollution and therefore improve physical health. Actions that encourage physical mobility can also improve physical health while educational programs can help prevent future physical harm and improve mental health. Certain actions were grouped together to evaluate their combined impact in order to align with the GHG reduction potential impact rating.

Capacity to Implement

UCR's capacity to implement was qualitatively assessed and reflects UCR's current staff capacity and available funding to implement the actions.

Table 15 **Evaluation Criteria and Ratings**

Criteria	Definition/Ratings
Priority Level	Action priority level to help UCR phase CAAP implementation: **Short-term actions** Priority actions to be implemented in the next 1-3 years **Near-term actions** Actions to be implemented after short-term actions
Emissions Scope and/or Hazard Addressed	1 2 3 Which emissions scope the action address (1, 2, 3) and/or the climate hazard the action addresses (extreme heat, wildfires and smoke, extreme precipitation, or drought)

Criteria	Definition/Ratings
GHG Reduction Type and Potential	Ability of the action to reduce GHG emissions. Certain action's GHG reductions are aggregated with other action's. GHG reduction types include: **Direct** Implementing the action directly results in emissions reductions **Enabling** The action is a key/enabling first step to take more direct action **Supporting** The action supports emissions reductions indirectly GHG reduction ranges include ($MTCO_2e$/year): **High** >2,000 **Medium** 1,000 – 2,000 **Low** 100 – 1,000 **Very Low** <100 **Not Quantified** Actions that enable or support emissions reductions where the associated impacts are difficult to quantify

UCR SUSTAINABILITY STORIES

Jose is a Biology and Environmental Science major at UCR and member of the Office of Sustainability's Green Labs team. His academic and professional interests focus on water systems, climate change, and sustainability. He currently collaborates with research laboratories to implement and promote sustainable practices across campus. He's motivated by the idea of preserving a healthy environment for future generations and wants others to be able to enjoy and learn from nature the way he has.

Jose Linares

UCR College Corps Fellow—
Green Labs Program

Criteria	Definition/Ratings
Implementation Cost	The upfront capital expenditures and expenses associated with hiring additional staff or consultants (does not include operational and maintenance costs). Ratings include: $$$ **High** >$1M $$ **Medium** $250k – $1M $ **Low** < $250k
Cost Savings	Operational or maintenance cost savings provided by the action. Certain action's cost savings are aggregated with other action's. Ratings include: ● **High** High cost savings compared to other CAAP actions ◕ **Medium** Medium cost savings compared to other CAAP actions ○ **Low** Low cost savings compared to other CAAP actions – **None** No additional cost savings provided ▲ **Increases Costs** Action increases costs

Criteria	Definition/Ratings
Public Health Impacts	Physical, mental, and social benefits provided by the action. Certain action's public health impacts are aggregated with other action's. Ratings include: ● **High** High public health benefits compared to other CAAP actions ◕ **Medium** Medium public health benefits compared to other CAAP actions ○ **Low** Low public health benefits compared to other CAAP actions – **None** No additional public health benefits provided
Capacity to Implement	UCR's current staff capacity and available funding to implement the action. Ratings include: ● **High** Staff have capacity to implement the action and there is funding available or no additional funding needed ◕ **Medium** Staff have capacity to implement the action but not enough funding, OR funding is available/not needed but staff have no capacity or would need to hire an outside consultant to implement ○ **Low** Staff could implement the action but do not have capacity or funding – **None** Staff do not have capacity to implement and there is no funding to implement

Equity Impacts

The UC Policy requires campuses to follow guidance from the EJCJ Framework. To determine the actions' equity impact, actions were evaluated based on questions from the UC EJCJ Framework. Each action was assessed based on 1) the assumed populations impacted by the actions, 2) the potential benefits from action implementation, and 3) the potential risks or unintended consequences that could result from action implementation. Rather than developing a rating for this criteria, the specific benefits and risks are noted for each action in the action tables, and holistic recommendations that can reduce potential risks and advance equity during implementation are included.

Benefits

Benefits that have the potential to improve the health, education, and quality of life outcomes for populations more vulnerable to climate impacts were considered and they include:

Air Quality Improvements
From reduced air pollution produced by building operations and vehicle fuel combustion, and increased vegetation to sequester carbon.

Community Engagement
From opportunities to conduct outreach and collaborate across the campus and surrounding community.

Access to Clean and Safe Transportation Options
From increased mobility across modes and understanding barriers to access alternative transportation modes.

Public Health Improvements
From opportunities that promote active lifestyles and improve health outcomes for participants.

Student Learning Opportunities
From opportunities through living labs, research, and curriculum.

Energy Efficiency Savings
From opportunities that create energy improvements and utility cost savings.

Local Jobs
From jobs created by construction and installation of infrastructure and systems.

Sustainability Careers
From opportunities to gain the skills necessary to build careers in sustainability related fields.

Emergency Preparedness/ Resilience
From opportunities to increase awareness and preparedness to climate hazards and emergency events.

EV Access
From greater availability of EV infrastructure that can reduce barriers to access for those without charging infrastructure at their residence.

Affordable Housing
From opportunities to provide more affordable housing through strategic transportation and land use planning and development.

Reduced Food Insecurity
From opportunities to partner with existing organizations and programs to provide fresh produce to food insecure populations.

[90] California Dream Index. https://www.cadreamindex.org/indicator/air-quality

[91] UCR News. https://news.ucr.edu/articles/2024/08/29/ucr-among-top-us-universities-serving-low-income-students

[92] University of California. The Importance of Pell Grants for UC Students. https://www.ucop.edu/federal-governmental-relations/_files/fact-sheets/uc_pell_grants_fact_sheet.pdf

[93] American County Survey 2023 5-year Estimates. https://www.census.gov/programs-surveys/acs

[94] UCR Rankings. https://www.ucr.edu/rankings

[95] UC Student Disaggregated Race and Ethnicity Data. https://www.universityofcalifornia.edu/about-us/information-center/disaggregated-data

Risks

To understand potential risks, we considered how an action's implementation may inadvertently harm communities more vulnerable to climate impacts, or worsen existing disparities. These include:

Health
The region experiences significant air quality issues. In 2021 Riverside County's median air quality was 41 as measured by the Air Quality Index (AQI), 15% worse than the state of California's 36 AQI. This measurement uses the U.S. EPA definition of air quality which includes PM 2.5, PM 10, carbon monoxide, lead, nitrogen oxide, ground-level ozone, and sulfur oxides.[90]

Economic
UCR is among the top national universities with the highest share of Pell grant recipients which are awarded to students from lower income households. Over 50% of undergraduates at UCR are eligible to receive Pell grants, compared to 35% of all undergraduates in the UC system.[91] [92]

Transportation
In 2023 4.8% of households in Riverside County did not have access to a vehicle, similar to other counties in the region such as Orange County and San Bernardino County, but less than the 8.3% of households without access to a vehicle in the state of California.[93]

Social/Cultural
UCR has a high percentage of students who are first-generation and a majority BIPOC student body, almost 80% in the 2024-2025 school year compared to 70% of undergraduates in the UC system.[94] [95]

Risks that have the potential to worsen disparities and create unintended consequences for populations more vulnerable to climate impacts were considered and they include:

Cost Burden
Potential for UCR funding for climate action implementation to cause unintended consequences such as raised tuition or fees that inadvertently create barriers to education for low-income populations.

Displacement
The addition of new active transportation infrastructure, transit-oriented development, and changes to land use and zoning could create higher costs for existing residents and displace low-income populations.

Limited Engagement
Potential that engagement is not comprehensive to include input from underrepresented communities and therefore action implementation does not consider the challenges and opportunities of these groups.

Language Barriers and Cultural Insensitivity
Potential that communications are not inclusive or reflective of the array of languages spoken and cultures practiced in the community.

Charging Unaffordability
Potential for inequity in EV access if the price to charge vehicles is unaffordable for low-income populations.

Inequitable Access
Potential that transportation options limit who is able to participate or benefit based on age, ability, income, language, or other related factors.

Unfair Access
Potential that some groups are systematically excluded or disadvantaged from an evaluation or application process.

Climate and Environmental Justice Recommendations

Based on this analysis, the 15 priority climate actions in the CAAP have the potential to provide equitable benefits to campus users and surrounding community members and pose a low risk of worsening existing disparities for marginalized and underrepresented communities on campus. However, opportunities exist to advance climate justice through the implementation of the climate actions. The following recommendations provide direction to reduce potential risks and advance equity.

1. **Accessible, Multilingual and Culturally Responsive Engagement and Communication**
   To effectively serve UCR's diverse campus community, all educational and engagement initiatives—including written, graphic, and verbal communications—should be multilingual and culturally responsive to the diversity of students, staff, and faculty. UCR should use a data informed approach to tailor climate action communications using demographic data and student experience surveys to ensure accessibility in primary languages and relevance in cultural context. Engagement efforts should prioritize inclusion of marginalized groups, including low-income, disabled, and communities of color, by addressing barriers such as literacy, socioeconomic status, and time constraints. Outreach should include accessible materials, presentations at student group meetings, and visible campus postings. Many marginalized communities are working class and residents of color who do not have the same availability as many UC staff whose main job is working on sustainability or research. It's important to acknowledge these differences in accessibility and adapt engagement models to serve communities that are usually underrepresented. Additionally, UCR should elevate community engagement efforts to move toward community ownership as deemed appropriate for certain climate action projects. For actions that have the potential to impact or benefit the surrounding community, off-campus underserved communities including local tribes, should be engaged to ensure future land use is respective of cultures and sacred places.

2. **Career Development**
   As UCR seeks to increase the sustainability-related curriculum and research opportunities available to students through living lab programs, UCR should consider how access to these can be fairly distributed to students where there is high demand and competition. UCR should establish a selection process that is unbiased and promotes access for marginalized communities such as first-generation students, low-income, disabled, and communities of color. An unbiased and accessible process can be developed by using transparent, criteria-based evaluations supported by trained, diverse reviewers. UCR should also offer holistic application support such as workshops and mentorship and provide constructive feedback to all applicants. Additionally, a portion of opportunities could be reserved for underrepresented students, and the process should be continuously monitored and improved based on demographic data and student input.

3. **Equitable Access to Safe and Convenient Transportation Options for People of All Abilities**
   For actions related to micromobility and active transportation infrastructure UCR should ensure access to these modes is provided for all ages and abilities. Through the student commuting survey, UCR can identify some of the barriers students face to accessing alternate modes of transportation and a similar survey should be conducted for staff and faculty on campus to identify additional barriers these groups face. Further, when planning for more EV infrastructure and access on campus the affordability of charging a vehicle should be considered if the charging infrastructure will be available to the public. UCR should consider offering incentives or reducing pricing for low-income students and staff to increase accessibility to electric vehicles.

UCR should continue to follow existing procedures that promote sourcing minority-owned, women-owned, disadvantaged businesses, and small businesses to support these underrepresented groups.

4. **Workforce Development and Local Hiring**
   For actions that require on-site construction or installations, UCR should prioritize local hiring to support workers in the surrounding community. To promote and support the local workforce for these jobs, UCR's Office of Research and Economic Development (RED) should continue to partner with regional organizations through the SoCAL OASIS public-private partnership to create workforce training programs that bridge the skills gap needed to implement climate actions in these sectors.

   Additionally, for materials and services being procured by UCR for climate action implementation, UCR should continue to follow existing procedures that promote sourcing minority-owned, women-owned, disadvantaged businesses, and small businesses to support these underrepresented groups. These procedures include the Small Business First Program (SB1st) that calls for non-construction contracts and procurements between $10,000 and $250,000 to be awarded to certified Small Businesses (SBs) and/or Disabled Veteran Business Enterprises (DVBEs), wherever applicable and aims to meet the University of California goal of 25% small business utilization for overall annual contract dollars.

5. **Food Security**
   The R'Garden Program has the potential to expand the impact of their operations and reduce food insecurity by connecting the fresh produce generated at the garden to the food insecure populations on campus and in the surrounding community. The R'Pantry program currently provides non-perishable food and a collaboration with the R'Garden could connect students and community members to additional resources. UCR should determine the feasibility and logistics of a collaboration between R'Pantry and R'Garden including transport of the produce, refrigeration and storage, and access to produce from R'Garden for community members through local community partners that offer food resources.

6. **Reducing the Cost Burden of Climate Investments**
   The capital costs to implement actions will be funded by UCR but the campus should ensure that project costs do not cause unintended consequences. For instance, if investments are funded by raising tuition or fees, the CAAP may inadvertently create barriers to education for low-income populations. To avoid this risk, UCR should identify funding and financing strategies for each action or grouping of actions such as research grants or private donations to avoid investment costs being passed down to students from low-income households.

7. **Reduce Displacement Risk**
   For actions that promote regional collaboration and result in infrastructure projects outside of the UCR campus, gentrification due to redevelopment in the surrounding community could become an unintended consequence. The addition of new active transportation infrastructure and changes to development types could increase housing demand and costs for existing residents and potentially displace people or disrupt existing communities. In the collaboration with the City, UCR should advocate for policy that creates housing affordability. UCR and the City will need to prioritize multimodal connectivity improvements, especially in areas with a high percentage of residents with no-vehicle access who rely more heavily on alternative modes such as transit.

UCR SUSTAINABILITY STORIES

In his position as the Associate Dean of the Bourns College of Engineering (BCoE), **Matthew** oversees the broad research within BCoE, including its research centers. Much of this research is related to climate, clean air, transportation, and energy. In addition to conducting research, BCoE has a robust set of graduate programs of both Master's and PhD students working in these exciting research areas.

Matthew believes that climate change is one of the most important threats to humanity, and the world need to quickly come up with multi-disciplinary solutions (technical, political, societal, behavioral, etc.)

Matthew Barth, PhD

Distinguished Professor in Electrical and Computer Engineering

Associate Dean of Research and Graduate Education

Sustainability Committee Member

Action Summary Table

Table 16 presents a summary of the plan's fifteen (15) climate actions, including GHG emissions scope and/or climate hazards addressed, implementation priority levels, GHG reduction potential, implementation costs, potential savings, public health impacts, and UCR's capacity to implement. The rating keys are on the bottom of the page. The tables that follow in the remainder of this chapter present additional details for each individual action.

Table 16 Climate Action Summary Table

#	Action Title	Scope and/or Hazard Addressed	Priority Level	GHG Reduction Potential	Implementation Cost	Cost Savings	Public Health Impact	Capacity to Implement
1	All-Electric Buildings	1	Short-Term	High	$$$	Low	Medium	Low
2	Energy Analysis Systems	1, 2	Short-Term	High	$$$	Medium	Medium	–
3	Battery Storage Study	2	Near-Term	Not Quantified	$	Low	–	–
4	Sustainable Fleet Transition Plan	1	Near-Term	Low	$$$	High	High	–
5	EV Funding	1, 3	Near-Term		$			–
6	Regional Connectivity	1, 3	Near-Term	Medium	$	Increases Cost	Medium	Low
7	Micromobility Study	1, 3	Short-Term		$			–
8	Micromobility Infrastructure	1, 3	Near-Term		$$$			–
9	Student Commute Survey	3	Near-Term	Not Quantified	$	–	Low	High
10	Compost Improvements	3	Short-Term	Low	$$$	–	Low	–
11	R'Garden Program	3	Short-Term	Not Quantified	$	Increases Cost	Low	–
12	Tree Planting	2 Extreme Heat	Near-Term	Very Low	$$$	Low	Medium	Low
13	Resilience Education	All Hazards	Near-Term	Not Quantified	$$$	Low	High	–
14	Campus Campaign	1, 2, 3 All Hazards	Near-Term	Not Quantified	$$$	Low	Low	Medium
15	Sustainability in Academics	1, 2, 3 All Hazards	Near-Term	Not Quantified	$	Increases Cost	Low	–

Short-Term **Near-Term**

$$$ **High** $$ **Medium** $ **Low**

High Medium Low Very Low

Not Quantified None Increases Cost Aggregated Impacts

#

Action Icon

How to Read CAAP Action Pages

This page describes how to read the individual CAAP actions that follow.

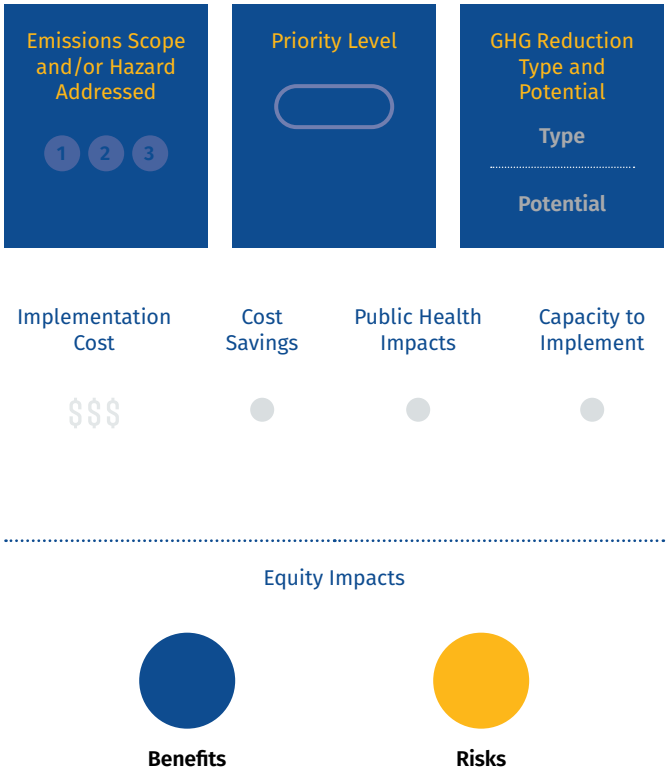
Supporting Visuals

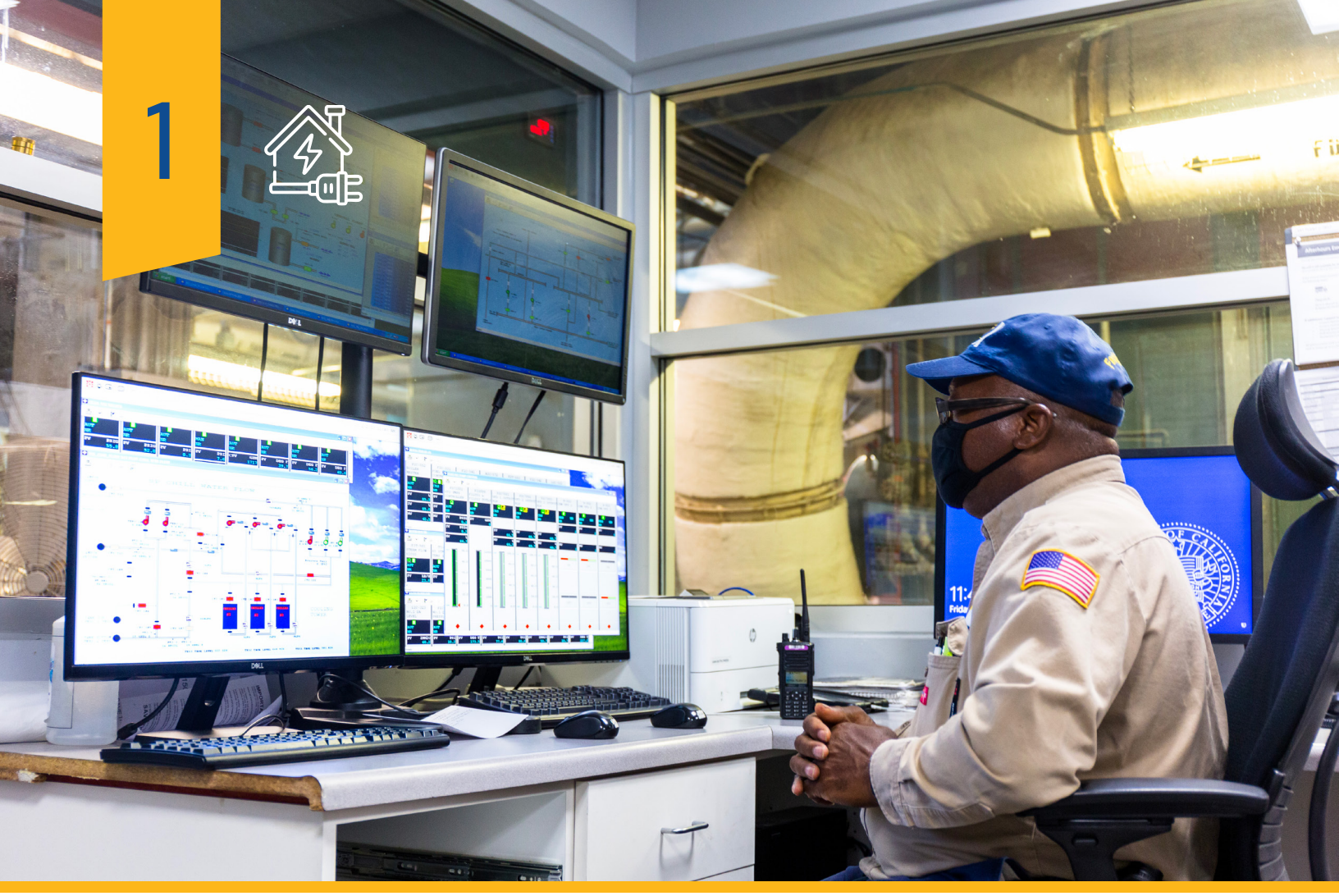
ACTION TITLE

Detailed action description

Implementation Lead/s

The entities that will lead action implementation





1

ALL-ELECTRIC BUILDINGS

Establish an all-electric green building guidelines for new construction.

Implementation Leads

Planning, Design & Construction

Facilities Services

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Short-Term	Direct High

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Medium	Low	Medium	Low

Equity Impacts

Air Quality Improvements

Local Jobs

Cost Burden

2

ENERGY ANALYSIS SYSTEMS

Develop a campus building and facility energy analytics program using tools such as SkySpark® and jointly led by campus operations leadership and student interns.

Implementation Leads

Planning, Design & Construction

Facilities Services

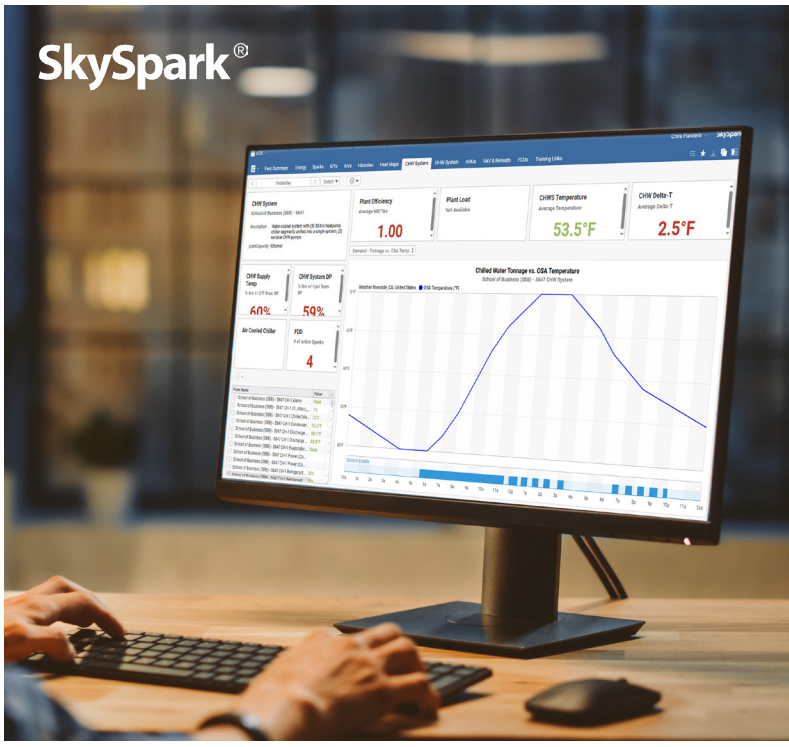
Office of Sustainability

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Short-Term	Enabling High

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Medium	Medium	Medium	None

Equity Impacts

- **Air Quality Improvements**
- **Local Jobs**
- **Cost Burden**
- **Student Learning Opportunities**
- **Energy Efficiency Savings**



3

BATTERY STORAGE STUDY

Investigate use of battery storage for existing buildings.

Implementation Leads

Planning, Design & Construction

Facilities Services

Environmental Health & Safety

Fire & Life Safety

External Coordinating Partner: RPU

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 **2** 3	Near-Term	Direct × Not Quantified

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Low	Low	– None	– None

Equity Impacts

Emergency Preparedness/ Resilience

SUSTAINABLE FLEET TRANSITION PLAN

4

Develop a University Fleet Transition Plan to replace existing diesel and gasoline vehicles with more sustainable options such as zero-emission vehicles, plug-in hybrid, or dedicated clean vehicles where feasible.

Implementation Lead

Transportation and Parking Services

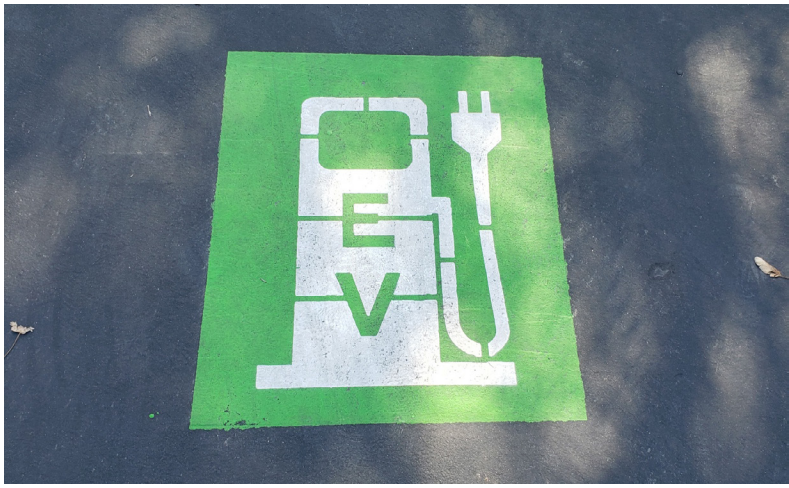
Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Near-Term	Enabling Low*

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Medium	High*	High*	– None

Equity Impacts

Air Quality Improvements

Cost Burden



* Impacts aggregated with Action #5

5

EV FUNDING

Partner with local and state organizations to assist in securing grant funding for low/zero-emission fleet vehicles and charging equipment infrastructure for students, staff, and faculty use.

Implementation Leads

Transportation and Parking Services

Office of Sustainability

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Near-Term	Enabling Low*

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Low	High*	High*	– None

Equity Impacts

- **Air Quality Improvements**
- **Local Jobs**
- **Charging Unaffordability**
- **EV Access**

* Impacts aggregated with Action #4

6

REGIONAL CONNECTIVITY

Partner with the City of Riverside, relevant transportation agencies, and nearby jurisdictions to increase the connectivity of active transportation infrastructure (bike lanes, path/trail connections) and strategize future land use and housing development to aid in campus commuting.

Implementation Leads

Transportation and Parking Services

Planning, Design & Construction

External Coordinating Partners:
City of Riverside and Riverside County

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Near-Term	Enabling Medium*

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Low	Increases Costs*	High*	None

Equity Impacts

- Access to Clean and Safe Transportation Options
- Air Quality Improvements
- Displacement
- Affordable Housing
- Public Health Improvements

* Impacts aggregated with Actions #7 and #8

7

MICROMOBILITY STUDY

Conduct a needs assessment and identify strategies that make sustainable transportation options convenient, safe, and the preferred choice for students and faculty to commute and move around campus.

The study will be developed with the help of students and can consider safety improvements for pedestrians, scooters, public bike rental programs, and campus electric bus systems. Results from this study can be used to directly inform Action 8: Micromobility Infrastructure.

Implementation Leads

Transportation and Parking Services

Planning, Design & Construction

External Coordinating Partners:
City of Riverside and Riverside County

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Short-Term	Enabling Medium*

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Low	▲ Increases Costs*	● High*	– None

Equity Impacts

- Public Health Improvements
- Access to Clean and Safe Transportation Options
- Limited Engagement
- Inequitable Access
- Air Quality Improvements
- Affordable Housing
- Language Barriers and Cultural Insensitivity

* Impacts aggregated with Actions #6 and #8

8

MICROMOBILITY STRUCTURE

Increase micromobility infrastructure, such as for scooters and bicycles, by adding protected lanes, storage cages at campus facilities, and shade structures across micromobility pathways. This could include providing more shade structures or trees along pathways.

Implementation Leads

Transportation and Parking Services

Planning, Design & Construction

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3	Near-Term	Direct Medium*

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ High*	▲ Increases Costs*	● High*	– None

Equity Impacts

- **Public Health Improvements**
- **Access to Clean and Safe Transportation Options**
- **Inequitable Access**
- **Air Quality Improvements**
- **Affordable Housing**
- **Language Barriers and Cultural Insensitivity**

* Impacts aggregated with Actions #6 and #7

9

STUDENT COMMUTE SURVEY

Conduct an annual student commuting survey to better understand student commute patterns and identify solutions to reduce single occupant vehicle use and increase campus accessibility.

Implementation Lead

Transportation and Parking Services

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 **3**	**Near-Term**	**Supporting** / **× Not Quantified**

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ **Low**	– **None**	– **None**	● **High**

Equity Impacts

- **Access to Clean and Safe Transportation Options**
- **Limited Engagement**
- **Inequitable Access**
- **Language Barriers and Cultural Insensitivity**

10

COMPOST IMPROVEMENTS

Provide more compost bins and secure funding for Facilities Services to enforce composting and requirements of SB1383.

Implementation Leads

Facilities Services

Auxiliaries (Housing/Dining)

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 **3**	**Short-Term**	**Direct** — **Low**

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ **Medium**	– **None**	○ **Low**	– **None**

Equity Impacts

Student Learning Opportunities

Cost Burden

Language Barriers and Cultural Insensitivity

11

R'GARDEN PROGRAM

Develop a climate-resilient food-production living lab through R'Garden and secure funding.

Implementation Leads

Office of Sustainability

College of Natural & Agricultural Sciences Dean's Office

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3*	Short-Term	Supporting × Not Quantified

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ Low	▲ Increases Costs	○ Low	– None

Equity Impacts

Air Quality Improvements	Student Learning Opportunities	Reduced Food Insecurity	Community Engagement

* Note: Scope 3 consumption-related emissions are not currently included in the UCR GHG inventory

12

TREE PLANTING

Plant more climate appropriate, native, and drought-tolerant trees on campus to provide shade in areas with considerable foot traffic and to sequester carbon.

Implementation Leads

Facilities Services

Planning, Design & Construction

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3 **Extreme Heat**	**Near-Term**	**Direct** ● **Very Low**

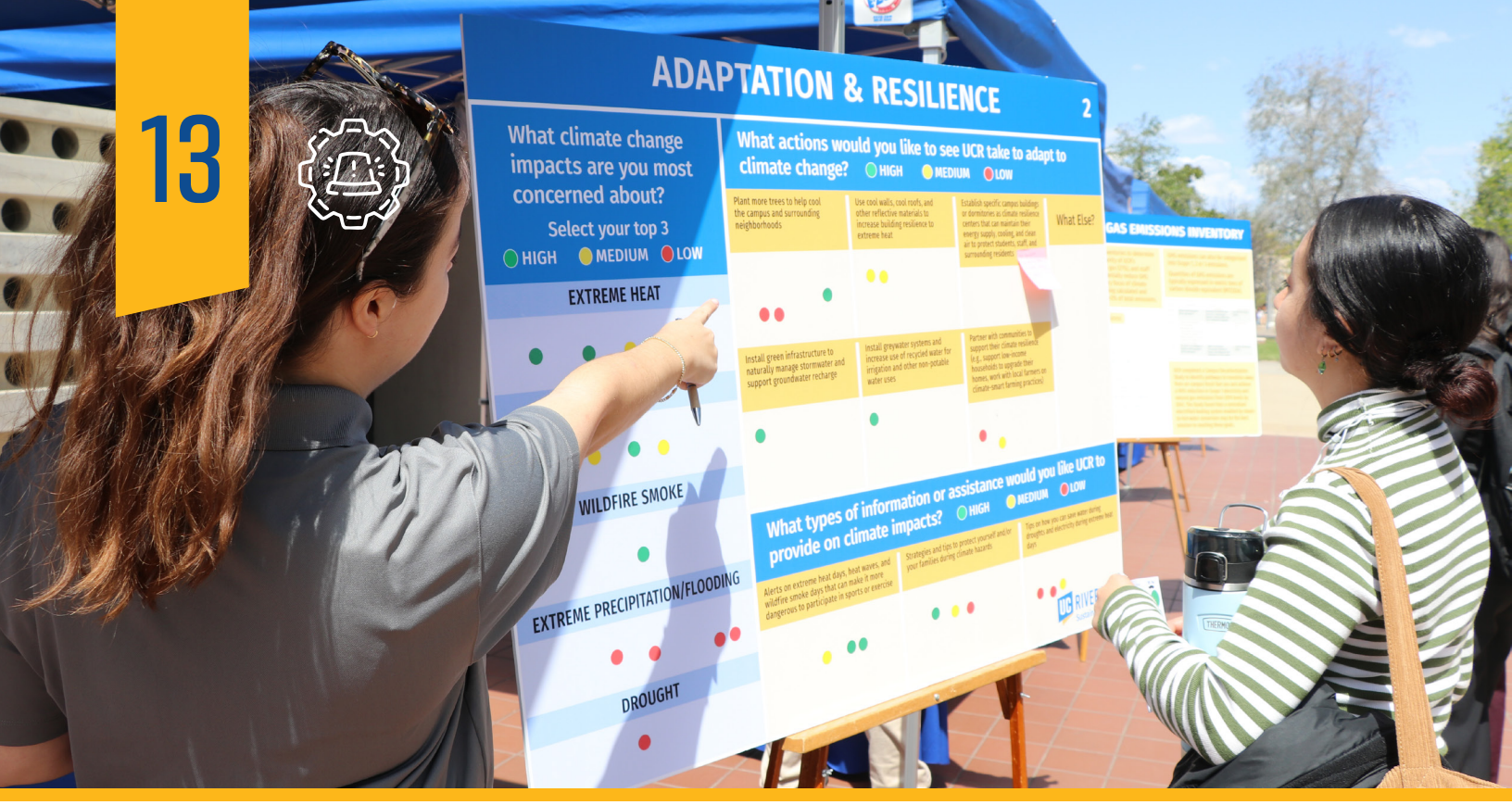
Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ **High**	**Low**	**Medium**	**Low**

Equity Impacts

Air Quality Improvements

Local Jobs

Cost Burden



13

CAMPUS RESILIENCE

Enhance campus resilience against climate hazards by developing emergency mitigation and response plans, expanding emergency training programs, and installing weather stations around campus.

Implementation Leads

Office of Sustainability

Environmental Health and Safety - Office of Emergency Management

Facilities Services

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3		Supporting
All Climate Hazards	Near-Term	× Not Quantified

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$	○	●	–
Medium	Low	High	None

Equity Impacts

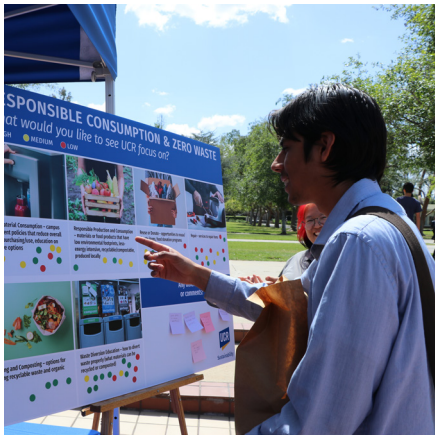
- **Emergency Preparedness/ Resilience**
- **Cost Burden**
- **Language Barriers and Cultural Insensitivity**

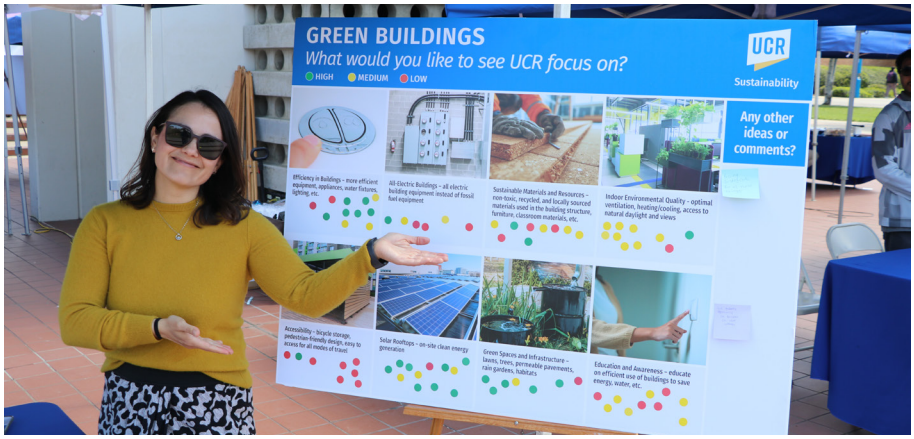

NSUMPTION & ZERO WASTE
see UCR focus on?
Any other ideas or comments?


S INVENTORY
emissions can also be categorized
Scope 1, 2 or 3 emissions.
ntities of GHG emissions are
cally expressed in metric tons of
on dioxide equivalent (MTCO2e).
UCR completed a Campus Decarbonization Study to identify pathways to transition away from on-campus fossil fuel use and achieve a 90% reduction in Scope 1 electricity and natural gas emissions from 2019 levels by 2045. The Study found that a centralized electrified heating system enabled by steam-to-hot-water conversion may be the best solution to reaching these goals.


UCR GREENHOUSE GAS EMISSIONS INVENTORY


GREEN BUILDINGS
What would you like to see UCR focus on?


SPONSIBLE CONSUMPTION & ZERO WASTE
at would you like to see UCR focus on?


GREEN BUILDINGS
What would you like to see UCR focus on?
HIGH
MEDIUM
LOW
UCR
Sustainability
Any other ideas or comments?

14

CAMPUS CAMPAIGN

Create a coordinated marketing and media campaign to enhance the visibility and impact of sustainability and climate action on campus to reach a larger audience, including students, faculty, staff, and visitors. Create a marketing and media campaign to rebrand sustainability and climate action to reach a larger audience, including students, faculty, staff, and visitors.

Implementation Leads

Office of Sustainability

UCR Residential Life

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3 **All Climate Hazards**	**Near-Term**	**Supporting** / **× Not Quantified**

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ **Medium**	**Low**	**Low**	**Medium**

Equity Impacts

Community Engagement

Cost Burden

Language Barriers and Cultural Insensitivity

15

SUSTAINABILITY IN ACADEMICS

Identify and create sustainability-related curriculum and living lab opportunities for students.

Implementation Lead
Office of Sustainability

Emissions Scope and/or Hazard Addressed	Priority Level	GHG Reduction Type and Potential
1 2 3 **All Climate Hazards**	**Near-Term**	**Supporting** / **× Not Quantified**

Implementation Cost	Cost Savings	Public Health Impacts	Capacity to Implement
$$$ **Low**	▲ **Increases Costs**	○ **Low**	– **None**

Equity Impacts

Sustainability Careers

Unfair Access

Other CAAP Actions

Twenty-five (25) additional climate actions were identified during the CAAP action development process that were not selected for further evaluation and prioritization. However, these actions are still important to UCR and the community and can also be pursued during CAAP implementation or as part of future CAAP updates.

Green Buildings

1. **Existing Building LEED Requirement**
   Work toward pursuing LEED O+M certification for existing buildings that have the supporting infrastructure to pursue certification.

2. **Building Efficiency Education and Outreach**
   Develop an education and outreach program to promote energy- and water-efficient behaviors, such as proper thermostat use, for students, staff, and visitors.

3. **Refrigerant Management Policy**
   Create a Refrigerant Management Policy to map the requirements for transitioning to low-GWP refrigerants and analyze the economics of storing the new refrigerants. Follow the UCR SB106 Transition Plan to conduct a refrigerant inventory and develop a transition policy.

4. **Microgrid**
   Investigate potential for establishing microgrids within UCR.

Clean Energy

5. **100% Renewable Electricity**
   Purchase 100% renewable energy for all campus electricity use through RPU.

6. **On-site Renewables**
   Investigate the feasibility of additional on-site renewable energy alternatives such as solar panels and wind turbines.

These actions are still important to UCR and the community and can also be pursued during CAAP implementation or as part of future CAAP updates.

Sustainable Transportation

7. **EV Charging**
   Add more Level II and Level III EV chargers for student, staff, and faculty use.

8. **Air Travel Mitigation Fund**
   Pilot an air travel mitigation fund program through which a fee is collected for UCR business air travel that is then awarded to on-campus projects that result in a measurable carbon reduction.

9. **Air Travel Education Program**
   Provide education on the benefits of online meetings/conferences instead of air travel.

Zero Waste

10. **Waste Diversion Education**
    Provide enhanced advertising and education on existing waste diversion resources and practices (e.g., e-waste program, standardized waste signage for waste sorting, etc.).

11. **Automatic Waste Sorting**
    Pilot an artificial intelligence-powered waste sorting system that identifies waste types and guides users on how to dispose of waste (e.g., Oscar Touch AI).

12. **Reusable Container Program**
    Expand the existing reusable container program across campus.

Resilience

13. **Air Quality Education**
    Publicize air quality and temperatures around campus and provide context to previous years (e.g., website, campus screens, etc.).

14. **Mask Provisions**
    Provide masks for students/faculty during poor air quality days and/or extend EHS N-95 mask request program to students.

15. **Building Air Filtration**
    Install better air filtration systems in buildings and/or improve building envelopes to prevent outside air infiltration.

16. **Hydration Stations**
    Add more filtered water hydration stations and update online maps.

17. **Pop-up Shade**
    Provide pop-up shade areas during abnormally hot days.

18. **Bus Stop Shade**
    Add more bus stop shade structures.

19. **Class Times**
    Offer early or evening classes in the hotter months to avoid students going to class in peak heat hours of the day.

20. **Cooling Centers**
    Provide a cooling center on campus, potentially open to the general public as well. Ensure cooling centers are accessible to staff who work outdoors, such as grounds-keeping crews.

21. **Recycled Water Irrigation**
    Convert landscape irrigation to recycled water.

22. **Stormwater Management**
    Incorporate stormwater best practices and green infrastructure into built projects on campus.

23. **Native Landscaping**
    Develop a native landscaping/xeriscaping policy for new projects involving landscaping and for existing landscaping to be transitioned as vegetation needs to be replaced.

24. **Fire Resilient Landscaping Certifications**
    Pursue fire safety certifications for UCR landscape staff, such as ReScape's Resilient Regenerative Firescaping Qualification Training or USGBC-LA Wildfire Defense Professional Certificate.

Academics and Engagement

25. **Climate Justice and Impact Institute**
    Create a dedicated Climate Justice and Impact Institute that consolidates climate-related research, data, and initiatives from across all departments. This entity would bridge academic research with operational action, community engagement, and policy impact. Currently, research, student efforts, and sustainability projects often operate in silos. A more integrated structure would transform UCR's climate work into a cohesive, interdisciplinary force—making it more visible, accessible, and actionable for the campus community and society at large.

UCR SUSTAINABILITY STORIES

Ashley graduated from UCR with a Bachelor of Arts in Gender & Sexuality Studies and a minor in Ethnic Studies. During her time as an intern at the R'Garden, she learned how the garden supports climate action and was introduced to her Climate Action Corps fellowship opportunity.

Prior to her internship, Ashley was not deeply involved in sustainability efforts. However, the garden played a pivotal role in her understanding of climate mitigation through education. It inspired her to actively participate in climate-related projects and to advocate for keeping the garden accessible to both students and the Riverside community.

As a fellow, Ashley's goal is to help sustain and maintain the garden, ensuring it continues to serve as a resource for education, sustainability, and community engagement.

Ashley Avila

California Climate Action Corps Fellow—
R'Garden 2025–2026

IMPLEMENTATION AND MONITORING

08

Implementation and Monitoring

As climate action planning is an iterative process, the CAAP is a living document that is meant to reflect the current physical, political, and financial climate impacting the university. UCR is committed to providing the necessary resources and technical support to ensure successful CAAP implementation with the help of its partners and other stakeholders. When implementing the CAAP, it is important to account for other financial benefits that are often overlooked, including:

Operational Savings
Renewable energy, energy/water efficiency, and ZEV actions can substantially reduce utility and maintenance costs, decrease reliance on volatile energy markets, and increase energy resilience.

Risk Mitigation
Adaptation actions can reduce exposure to climate-related risks and help avoid future damages.

Asset Value Protection
Climate action can enhance the long-term value of campus infrastructure through resilience planning.

Funding Opportunities
Climate action can unlock access to federal/state grants, philanthropic funding, and green bonds.

Student and Faculty Attraction
Sustainability is a key factor in university choice for prospective students and faculty.

Regulatory Pressure
Preparing for climate change now can help UCR more easily respond to future mandates from local, state, or federal governments, which will also reduce future compliance costs. For example, Senate Bill 1383 mandates that entities divert organic waste from landfills, with potential penalties for non-compliance in the future.

The business case for CAAP implementation is clear – investing in climate action is a strategic decision that addresses the campus's climate impact and strengthens the university's financial health.

To monitor CAAP implementation progress, UCR will adhere to the UC Policy requirements by reporting the following in UCR's Annual Report on Sustainable Practices:

- Annual GHG emissions inventories
- Annual amount of clean electricity procurement
- Annual university fleet GHG emissions reduction progress (e.g., fleet efficiency metrics, commute data, and number and type of alternative fuel infrastructure)
- Annual percent reduction in energy use intensity (EUI) based on the sum of weather-adjusted energy use divided by the sum of the maintained gross square footage[96]
- Annual spending of the UCOP "in lieu" funds for direct emission reductions and reporting on other progress indicators (see UC Policy section III.C.2.d)

As the UC Policy is periodically updated, UCR will continue to monitor and respond to new UC Policy requirements and adjust reporting tactics accordingly. Outside of the Annual Report on Sustainable Practices, UCR will:

- Update the CAAP as necessary to incorporate new scientific insights and technological advances; reflect applicable laws, policies, and established global commitments; consider State and regional electricity supply issues; address social and cultural shifts around climate action; and reflect significant changes in emissions, such as through new acquisitions or divestments. If UCR's primary emissions sources change or new emission sources are introduced, the institution can revise its emissions forecasts and adapt its primary mitigation strategies to effectively respond to the evolving conditions. The CAAP can also be updated to respond to target achievement progress. For example, if UCR is not on track to achieve its GHG emissions targets, the CAAP can be updated to incorporate new or modified actions that better align with target achievement. Along with annual internal assessments and goal-realignment, a full CAAP re-evaluation and update will be conducted in 2035 in line with the LRDP outcomes assessment.

- Maintain internal and external communications on CAAP action progress and data reporting. The Office of Sustainability will communicate progress on the UCR Sustainability website[97], include updates in the monthly newsletter, and collaborate with UCR Communications to help inform the broader campus and community of CAAP progress.

- Identify and track equity indicators related to climate actions.

- Verify GHG emissions with a qualified third party and maintain individual membership with TCR as required by UC Policy.

[96] UCOP will use UCR data to calculate this value.

[97] UCR. Office of Sustainability. https://sustainability.ucr.edu

NEXT STEPS

09

Through the CAAP, UCR has developed a roadmap to substantially reduce its contribution to climate change and prepare for its impacts. While the CAAP represents an important first step toward climate action, its success is contingent upon securing adequate funding and maintaining ongoing, effective engagement with both the campus and the broader Riverside community.

Funding

The successful implementation of the CAAP is closely tied to securing adequate funding for its proposed actions. To obtain future funding, UCR will leverage the CAAP actions to identify the types of financial resources required and pursue applicable local, state, and federal funding opportunities. Although the five CAAP actions identified as short-term priorities will be the focus of initial funding applications, UCR remains committed to actively pursuing funding opportunities for all actions outlined within the CAAP. Additionally, UCR will continue submitting proposals to access the UCOP's decarbonization funds and foster cross-departmental collaboration to allocate budget to climate actions where appropriate.

Environmental Justice and Climate Justice

UCR will continue to encourage students and staff to help take ownership of action implementation and act as CAAP stewards. UCR will track the climate and equity issues that are most concerning to the campus community and adjust priorities accordingly. This engagement process will expand to include the broader community and frontline communities not yet engaged. UCR will continue to facilitate meetings between the Sustainability Committee, operations and maintenance staff, faculty, students, and community members to better identify next steps for climate action. UCR will engage with systemwide sustainability working groups, which are composed of sustainability professionals and subject-matter experts, to discuss the current status of sustainability policy areas and better align with the University of California's Policy on Sustainable Practices. UCR can also partner with programs such as UCR College Corps, California Climate Action Corps, or the UC Global Climate Leadership Council to leverage systemwide expertise and resources to enhance engagement and outreach, promote the implementation of climate actions, and foster civic-minded leaders dedicated to addressing climate challenges.

GHG Emissions Analysis

UCR will continue to update previous inventories with additional emissions sources and/or improved emissions calculation methods, identify emissions calculation tools to streamline reporting, and set Scope 2 emissions reductions targets.

The climate crisis is one of the defining challenges of our time—and UCR has a unique role to play in leading the transition to a sustainable future. This plan is not just about reducing emissions; it is about reimagining how the campus operates, educates, and engages with the world. By investing in climate action, UCR can strengthen institutional values, unlock long-term financial and operational benefits, and prepare the community to thrive in a rapidly changing global landscape. Together, UCR and its partners can transform the campus into a living laboratory for climate solutions—one that inspires innovation, drives equity, and leads by example. The time to act is now, and UCR is ready to rise to the challenge.

UCR SUSTAINABILITY STORIES

Ann is a faculty member in the School of Medicine at UCR and academic lead for the Unidas por Salud community academic team. She is an anthropologist and provides health services and public health research in collaboration with patients, communities, and stakeholders. The Unidas por Salud community academic partnership focuses on addressing health disparities among Latinx and Indigenous Mexicans in environmental justice communities, with emphasis on communities around the Salton Sea in Inland Southern California. Since 2018, the team has focused on addressing disparities in respiratory health through federally funded research as well as healthcare service delivery through the Coachella Valley Free Clinic. She is motivated to be involved in climate mitigation efforts as she believes humanity rests on the ability to adapt to climate change, which has and will continue to undermine social inequities visible in health.

Ann Cheney, PhD

Professor, School of Medicine

Director, Designated Emphasis in Medical Spanish

Faculty Director, Coachella Valley Free Clinic

APPENDIX

A

CLIMATE RISK ASSESSMENT

AECOM
150 California Street
San Francisco, CA 94111
aecom.com

Project name:
UCR Climate Action & Adaptation Plan

Date:
November 13, 2025

University of California, Riverside Climate Action & Adaptation Plan

Contents

Summary

The University of California, Riverside (UCR) faces growing climate-related risks that may intensify in frequency and severity over the coming decades. This qualitative vulnerability assessment identifies four key climate hazards—**wildfire, extreme heat, extreme precipitation, and drought**—that pose significant threats to UCR's physical assets, operations, and community well-being.

Hotter, drier conditions projected under a high-emissions scenario (Representative Concentration Pathway (RCP) 8.5 may increase the likelihood and intensity of local **wildfire** events, threatening health, buildings, utilities, and evacuation routes. UCR's proximity to multiple nature reserves—including Box Springs Mountain Reserve and Sycamore Canyon Park—places it at elevated risk. Increased wildfire events may negatively affect the UCR community's health through smoke and poor air quality, damage physical assets such as laboratories and dormitories, and impact operations through electric and water utilities shut offs.

Extreme heat is a particularly urgent concern, as the number of days exceeding 103.6°Fahrenheit are projected to rise from four days to 27 days by mid-century (2035-2064) and 48 days by end-of-century (2070-2099). Warm nights—when temperatures remain above 67.7°F—are also expected to increase dramatically to 36 nights by mid-century and 68 nights by end-of-century. These future conditions may strain air conditioning systems, leading to costly building upgrades or higher energy consumption costs. High temperatures may also pose serious health risks of heatstroke and dehydration, especially for staff who work outdoors and people who have preexisting health conditions.

Past **extreme precipitation** events have already caused flooding at UCR, as the campus sits within the University Arroyo watershed and includes areas within the Federal Emergency Management Agency's designated 100-year floodplain. Although future daily precipitation is projected to slightly increase up to 12 percent, more intense storms are likely, increasing the risk of flash flooding events that can overwhelm UCR's drainage infrastructure. Increased flooding events may also increase costs of flood-related repairs to buildings, affect access to campus, and disrupt campus operations.

Drought is not a direct threat to UCR's physical assets, but the university relies heavily on groundwater and imported water sources that are vulnerable to prolonged future droughts. This, combined with the UC system's water reduction targets, poses operational risks and may result in campus-wide conservation measures that affect landscaping, athletics, and residential services. In the long term, drought may also lead to higher water utility costs that financially affect university operations.

To prepare for these hazards, UCR may consider implementing adaptation actions to retrofit buildings for heat and flood resilience, protect community health, and increase campus water conservation. These actions can help reduce the university's exposure to climate hazards and improve its ability to respond to acute and chronic climate events.

Introduction

This report identifies the University of California, Riverside's (UCR) key climate hazards and relevant impacts based on desktop review of previous studies, including the County of Riverside's Multi-Jurisdictional Local Hazard Mitigation Plan (2023)[1] and other climate databases such as Cal-Adapt and ClimateCheck.[2] Cal-Adapt[3] data from California's 4th Climate Change Assessment provided future projections for climate hazards at the county level.[4]

This assessment uses the observed historical average values from 1961–1990 in Cal-Adapt as baseline values. These baselines serve as reference points to measure how future climate projections differ from past conditions that were considered "normal" before significant climate change impacts began. Climate projections are often communicated using Representative Concentration Pathways (RCPs), which model how greenhouse gas emissions may evolve under future scenarios. For instance, RCP2.6 represents a low-emissions pathway that could limit global warming to below 3.6°Fahrenheit (2°Celsius), while RCP8.5 reflects a high-emissions trajectory that may result in warming up to 7.9°F (4.4°C) by 2100.[5] Cal-Adapt uses RCPs to generate localized climate projections, and this assessment focuses on RCP8.5 to evaluate potential impacts under a worst-case scenario.

This assessment grouped UCR's physical campus assets into five categories: buildings & facilities, operations & utilities, access (transportation), athletics facilities, and community members (Table).

Table 1: UCR asset categories & examples

Category	Examples
Buildings & Facilities	Academic and administrative buildings, residence halls, dining facilities, auditoriums, laboratories, libraries, student health, recreation centers
Operations & Utilities	Steam plant, substations, chillers, natural gas boilers, service tunnel distribution system, solar photovoltaic systems, water storage tanks
Access (Transportation)	Campus roads, parking lots/structures, local roads and highways, local public transportation, micromobility, campus assembly areas, footpaths, bike paths
Athletics Facilities	Riverside Sports Complex, Johnson Family Practice Center, Amy S. Harrison Field, Agricultural Operations Course, track stadium, soccer stadium, tennis courts
Community Members	Students, staff, faculty, visitors

[1] County of Riverside Emergency Management Department. "County of Riverside Multi-Jurisdictional Local Hazard Mitigation Plan." April 2023. https://rivcoready.org/about-emd/plans/local-hazard-mitigation-plan.
[2] ClimateCheck. "Climate Risk Report - Flood, Fire, Storm, Heat and Drought." Accessed August 20, 2025. https://climatecheck.com.
[3] "Cal-Adapt." Accessed September 3, 2025. https://cmip5.cal-adapt.org/.
[4] After careful review of the Cal-Adapt version based on the 5th Climate Change Assessment, the project team chose to use the version based on the 4th Climate Change Assessment due to data inconsistencies and gaps in the recently-released version.
[5] Calvin, Katherine, Dipak Dasgupta, Gerhard Krinner, et al. *IPCC, 2023: Climate Change 2023: Synthesis Report.* Intergovernmental Panel on Climate Change (IPCC), 2023. https://doi.org/10.59327/IPCC/AR6-9789291691647.

Climate Hazards

Climate hazards are natural events—such as heat waves, wildfires, and flooding—that become more frequent or severe due to changing climate patterns. Local hazard mitigation plans, Cal-Adapt data from the 4th Assessment, and local disaster reports identify wildfire, extreme heat, and extreme precipitation as UCR's top climate hazards. Although drought does not threaten UCR's physical assets, it is a top hazard across California and has the potential to affect campus operations. The following sections explore UCR's key climate hazards in greater detail, summarizing past events, potential exposure, and possible impacts.

Table 2: Summary of projected exposures for UCR's key climate hazards

Hazard	Time Horizon	Exposure Projection (RCP8.5)
Wildfire Events	Mid-century	Hotter, drier conditions expected to increase frequency and severity of wildfire events
	End-of-century	
Extreme Heat Days	Mid-century	575% increase in extreme heat days per year
	End-of-century	1,100% increase in extreme heat days per year
Warm Nights	Mid-century	500% increase in warm nights per year
	End-of-century	1,033% increase in warm nights per year
Maximum Daily Precipitation	Mid-century	8% increase in the number of inches of rain per day
	End-of-century	12% increase in the number of inches of rain per day
Drought	Mid-century	Hotter, drier conditions expected to increase the frequency and severity of droughts
	End-of-century	

Wildfire

California's dry climate and seasonal rainfall create conditions for wildfires, which can occur year-round even during the winter season, as seen with the Palisades and Easton Fires in Los Angeles in early 2025. Although fire has historically played a role in California's ecosystem, the state now experiences fires that burn longer and hotter, negatively impacting communities miles away through smoke and poor air quality.[6, 7]

Past Events

At least one large wildfire has occurred in Riverside County each year since 2008.[1] As of August 2025, Riverside County has reported at least 43 wildfire incidents and adjacent San Bernardino County has reported at least 17 wildfire incidents to the California Department of Forestry and Fire Protection (CAL FIRE) since the start of 2025.[8] Several recent wildfire events in proximity to UCR include small brush fires in Box Springs Mountain Reserve in May and June of 2025 (seven acres burned), Rabbit Fire in July 2023 (8,355 acres burned), and the Sycamore Canyon Park fire in July 2019 (250 acres burned).[9, 10, 11, 12]

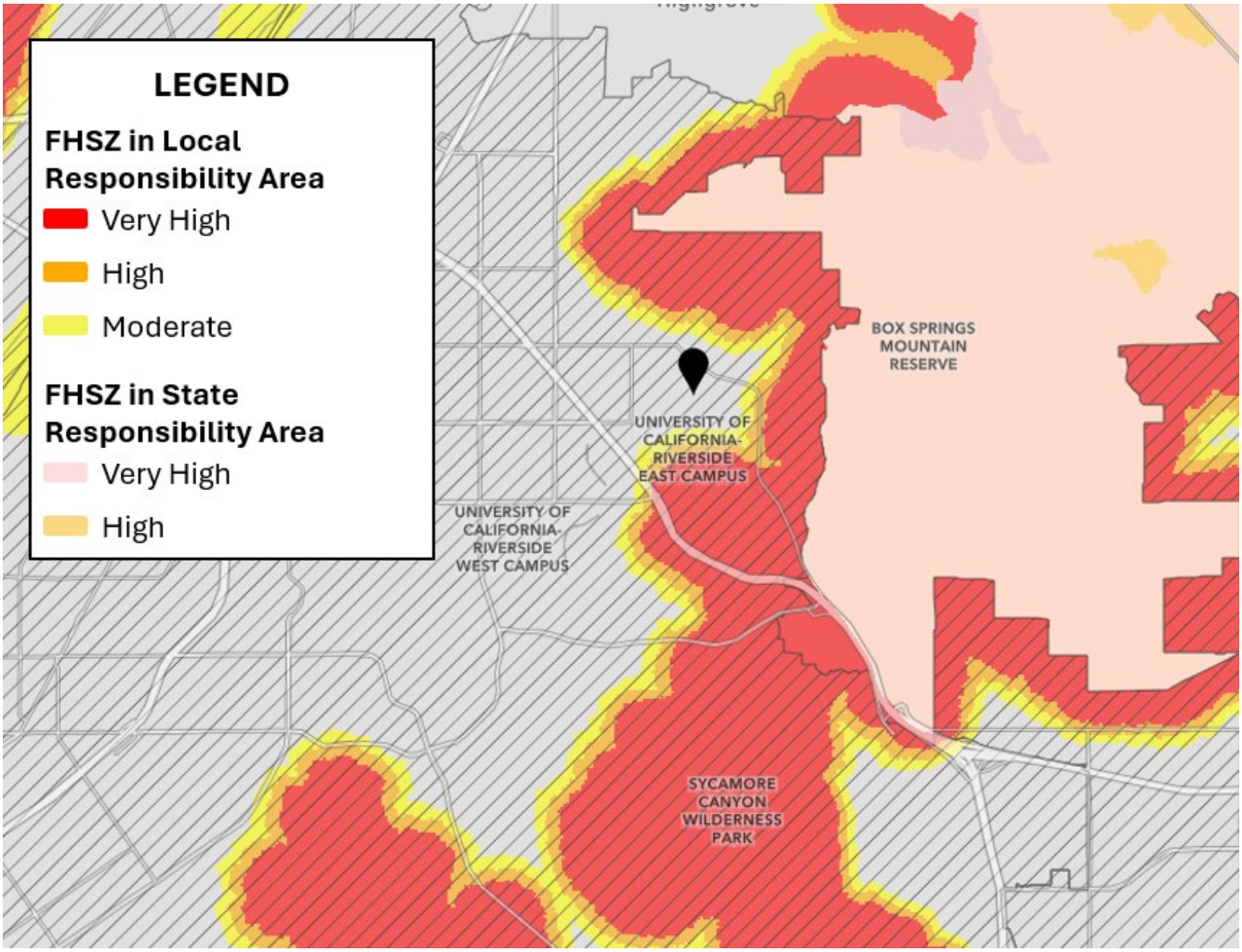
Current Exposure

Future fire events are anticipated to occur more frequently on the western side of the county, which is where UCR is located.[1] CAL FIRE and the State Fire Marshal use Fire Hazard Severity Zones (FHSZ) to classify the severity of fire for land within state responsibility areas. As shown in Figure 1, UCR falls into moderate, high, and very high FHSZs, based on 2024 data.[13]

[6] Legislative Analyst's Office | The California Legislature's Nonpartisan Fiscal and Policy Advisor. "Frequently Asked Questions About Wildfires in California." February 13, 2025. https://lao.ca.gov/Publications/Report/4952.
[7] California Air Resources Board. "Wildfires." Accessed August 20, 2025. https://ww2.arb.ca.gov/our-work/programs/wildfires.
[8] CAL FIRE. "2025 Fire Season Incident Archive." Accessed August 28, 2025. https://www.fire.ca.gov/incidents/2025.
[9] "Fire Chars Several Acres of Box Springs Mountain Reserve Park." *MyNewsLA.Com*, May 30, 2025. https://mynewsla.com/business/2025/05/30/fire-chars-several-acres-in-preserve-on-east-end-of-riverside/.
[10] "Blaze Erupts Near Box Springs Mountain Reserve." *MyNewsLA.Com*, June 10, 2025. https://mynewsla.com/business/2025/06/10/blaze-erupts-near-box-springs-mountain-reserve/.
[11] CAL FIRE. "Rabbit Fire." Accessed August 22, 2025. https://www.fire.ca.gov/incidents/2023/7/14/rabbit-fire.
[12] City of Riverside. "Sycamore Canyon Fire." Accessed August 27, 2025. https://riversideca.gov/fire/incident/sycamore-canyon-fire.
[13] California Office of the State Fire Marshal. "Fire Hazard Severity Zones." Accessed August 19, 2025. https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones.

UCR's central campus abuts Box Springs Mountain Reserve, a 3,400-acre recreational and natural park, which increases the university's wildfire risk.[14] In addition to Box Springs Mountain, the campus is positioned between several nature reserves: Live Oak Canyon farther to the east, Sycamore Canyon Park to the south, and Lake Matthews Estelle Mountain to the southwest. This suggests UCR may face higher risk from wildfire compared to other urbanized areas in the City of Riverside, especially as hotter and drier weather creates fire-prone conditions in the surrounding nature reserves. These nature reserves are managed by several different parties—County of Riverside, City of Riverside, Metropolitan Water District, Riverside County Habitat Conservation Agency—suggesting the importance of collaborating with other partners to manage and communicate fire risk.[14, 15, 16]

Figure 1: Fire Hazard Severity Zone from Cal-Fire as of 2025 for UCR and surrounding nature preserves of Box Springs Mountain Reserve and Sycamore Canyon Wilderness Park.



Future Impacts

Buildings & Facilities: Wildfire events may damage critical buildings such as dormitories and science laboratories, which can affect the student community's housing status, halt research operations, and release volatile chemicals into the air. Building damage may include burning, melting, weakening, cracking, smoke and soot, firefighting water damage, and chemical contamination. Damage may be limited to building exteriors, but may also encompass building contents, such as laboratory equipment or library archives. Furthermore, residual ash may linger on surfaces and exteriors, requiring

[14] Riverside County Regional Park and Open-Space District. "Box Springs Mountain Reserve." Accessed August 20, 2025. https://rivcoparks.org/open-space-areas-and-reserves/box-springs-mountain-reserve.
[15] City of Riverside. "Sycamore Canyon Wilderness Park." Accessed August 29, 2025. https://riversideca.gov/athomeinriverside/neighborhoods-sycamorecanyonpark.asp.
[16] California Land Conservation Assistance Network. "Estelle Mountain Ecological Reserve - Riverside County." Accessed August 29, 2025. http://www.californialandcan.org/local-resources/Estelle-Mountain-Ecological-Reserve--Riverside-County/28099.

management actions following a fire event. Due to the unpredictable nature of wildfire spread, impacted buildings may be immediately adjacent to each other or located at different areas of campus.

Operations & Utilities: Preventative measures during wildfire-prone weather conditions may impact campus energy supply through utility shut-offs. Local firefighting operations and power shut-offs may also strain campus water resources through reduced water pressure. Furthermore, damaged water infrastructure, flame retardant usage, and toxic run-off may negatively impact drinking water quality due to the presence of volatile organic compounds, heavy metals, and other contaminants.[17, 18]

Access: A nearby wildfire event may place the campus and its surrounding community under an evacuation order. Several main roads serve as egress-ingress routes for campus: Campus Drive, Big Springs Road, University Avenue, Canyon Crest Drive, West Linden Street, and Martin Luther King Boulevard. Interstate 215 is the main highway that allows access to the greater Riverside region. This provides several options for evacuation should road closures occur due to fire danger; however, evacuation creates high-traffic conditions for most major roads and this may limit emergency response operations for the greater campus.

Athletics Facilities: Due to the outdoor nature of many of UCR's athletics facilities, wildfire events may directly damage these assets and poor air quality may disrupt facility operations. There are also secondary impacts, for example, burned peat turf or running track can release more harmful chemicals into the air. Fires affecting nearby communities can release ash, requiring management plans and resources allocated towards ash and debris cleanup.

Community Members: Campus staff, students, and faculty will be impacted by poor air quality conditions in the event of a regional fire. Disruptions may occur across academic study, campus operations, and day-to-day life, with more severe impacts for individuals with sensitivity to air quality and other existing health conditions such as asthma, cardiovascular disease, or decreased lung function. Evacuation events may also be highly stressful for the student population, especially for those who do not have the means of transportation to evacuate and those who live on-campus and must rely on the university for housing and meals.

Extreme Heat

Extreme heat events have negative implications for both human health—dehydration, heat stroke, heat exhaustion, cramps, burns, respiratory issues—and infrastructure.[19] Heat waves are common in the region and heat alerts are provided by the National Weather Service in San Diego.[20] Cal-Adapt defines an extreme heat day as a day where the daily maximum exceeds the 98th percentile of historic (1961-1990) daily maximum temperatures between April and October.[3] In other words, extreme heat days are unusually hot days relative to the region's historic average. The City of Riverside's monthly average high temperatures are already high—for example, residents experience an average of 95°F in August—which means temperatures during extreme heat events are even higher.[21] Riverside's threshold temperature for extreme heat days is 103.6°F.[2]

Past Events

Riverside County recorded 1,627 emergency department visits and 65 deaths due to heat-related illness in 2024.[22] During the week of August 17-23, 2025, Riverside County Emergency Medical Services responded to 63 heat-related incidents and indicated an increase in emergency calls during a week where an extreme heat watch was in effect for several days.[23, 24]

[17] "2025 Los Angeles Wildfire Recovery | California State Water Resources Control Board." Accessed August 21, 2025. https://www.waterboards.ca.gov/water_issues/programs/emp/wildfire_recovery/.
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[19] Sumagaysay, Levi. "Hundreds of Deaths, Thousands of Injuries, Billions of Dollars: The Cost of Extreme Heat in California." Economy. *CalMatters*, July 8, 2024. https://calmatters.org/economy/2024/07/extreme-heat-report-insurance/.
[20] City of Riverside. "Extreme Heat." Accessed August 20, 2025. https://www.riversideca.gov/readyriverside/be-informed/hazards/extreme-heat.
[21] U.S. Climate Data. "Riverside, CA Weather Averages." Accessed August 20, 2025. https://www.usclimatedata.com/climate/riverside/california/united-states/usca1695.
[22] County of Riverside. "Public Health Officials Urge Precautions Against Heat-Related Illnesses as Temperatures Rise." Accessed August 20, 2025. https://rivco.org/news/public-health-officials-urge-precautions-against-heat-related-illnesses-temperatures-rise.
[23] County of Riverside. "Ambulance Patient Offload Time Special Seasonal Report – Week 34." https://rivcoready.org/sites/g/files/aldnop181/files/2025-08/2025APOTSPECIALweek34-Heat.pdf
[24] "Update: Extreme Heat Watch Issued for Riverside County from Thursday to Saturday." *Daily Bulletin*, August 19, 2025. https://www.dailybulletin.com/2025/08/19/update-extreme-heat-watch-issued-for-riverside-county-from-thursday-to-saturday/.

Exposure

Mid-Century (2035-2064): Under a RCP8.5 scenario, UCR is projected to experience an average of 27 days per year where the maximum daily temperature exceeds 103.6°F. This is a 575 percent increase compared to its observed baseline of four days per year between 1961-1990. UCR is projected to experience 36 warm nights per year, which is a 500 percent increase compared to its observed baseline of six warm nights per year between 1961-1990. Warm nights are a measure of how hot nighttime temperatures remain—and are strongly correlated with health impacts and infrastructure damage. It is considered an unusually warm night if nighttime temperatures do not fall below 67.7°F at UCR.[3]

End-of-Century (2070-2099): Under a RCP8.5 scenario, UCR is projected to experience an average of 48 days per year where the maximum daily temperature exceeds 103.6°F. This is a 1,100 percent increase compared to its observed baseline of four days per year between 1961-1990. UCR is projected to experience 68 warm nights per year, which is a 1,033 percent increase compared to its observed baseline of six warm nights per year between 1961-1990.[3]

Future Impacts

Buildings & Facilities: Extreme heat events will increase the demand for cooling, potentially straining resources and buildings' internal cooling systems. For example, heating, ventilation, and air conditioning (HVAC) systems may be inadequately sized for increasingly hotter days and nights, creating uncomfortable conditions for building inhabitants. Furthermore, high temperatures may also impact building structures through the cracking, corrosion, weakening, and expansion of building materials.[25]

Operations & Utilities: Rolling blackouts may occur during heat waves to reduce strain on the power grid.[26] UCR's on-campus electricity may be impacted since the university still consumes electricity from the grid.[27] Grid operators may also issue alerts that encourage energy conservation during heat waves, which could impact university operations if administrators decide to limit campus services or functions. Furthermore, regional resource constraints could result in higher energy costs for UCR.

Access: Staff, faculty, and more than 14,000 students commute to and from UCR every day.[28] Although the majority may commute by driving, public and active transportation users may face hazardous conditions due to heat.[29] For example, Metrolink, the regional rail system, may experience track infrastructure expansion and subsequent schedule delays that limit campus access. Individuals who use active or public transportation may face higher risk of heat-related health issues as they are exerting themselves or waiting for prolonged periods under high temperatures.

Athletics Facilities: Exposure to outdoor conditions during extreme heat events may result in accelerated wear and tear on assets, such as surface cracking, soil compaction or drying, turf degradation, and volatile organic compound release. Operations and maintenance practices may be ill-adapted to higher temperatures—for example, watering schedules may be insufficient for fields.

Community Members: Campus staff, students, and faculty may suffer from negative health impacts during extreme heat events. High temperatures are linked to poorer air quality conditions, make outdoor labor more dangerous for workers, and reduce worker productivity.[30, 31] Elevated indoor temperatures can make day-to-day routines and learning more challenging.[32] Campus events, such as sporting and cultural events, may be impacted as participants are actively exerting themselves under high temperatures, resulting in cancelled practice or rescheduled events.

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[25] EarthScan. "How Heatwaves Impact Infrastructures and Ecosystems." Accessed August 21, 2025. https://www.earth-scan.com/blog/heatwaves-impact.
[26] Aguilar, Vivienne. "Here's How Rolling Blackouts Work in California as Heat Wave Boils Region." *The Sacramento Bee*, n.d. Accessed August 27, 2025. https://www.sacbee.com/news/california/article265387836.html.
[27] "UC Riverside Sustainability Annual Report 2022." *University of California*, n.d. Accessed August 27, 2025. https://sustainabilityreport.ucop.edu/2022/locations/uc-riverside/.
[28] UC Riverside. "Resources For Commuter Students." Accessed August 27, 2025. https://studentlife.ucr.edu/commuter-resources.
[29] "Transportation and Extreme Heat." *Transportation For America*, August 13, 2024. https://t4america.org/2024/08/13/transportation-and-extreme-heat/.
[30] UC Riverside Environmental Health & Safety. "Outdoor and Heat Illness Prevention." Accessed August 28, 2025. https://ehs.ucr.edu/heat-illness-prevention.
[31] Cardenas, Beatriz, Shazabe Akhtar, and Beth Elliott. "What Happens When Extreme Heat and Air Pollution Collide." *World Resources Institute*, September 10, 2024. https://www.wri.org/insights/extreme-heat-air-pollution.
[32] Park, R. Jisung, Joshua Goodman, Michael Hurwitz, and Jonathan Smith. "Heat and Learning." *American Economic Journal: Economic Policy* 12, no. 2 (2020): 306–39. https://doi.org/10.1257/pol.20180612.

Extreme Precipitation and Flooding

Extreme precipitation occurs when a region receives significantly more rain or snow in a short period of time than usual. For California—and the Riverside region—atmospheric rivers are intense precipitation events that can replenish water supplies during the rainy season (November to March).[33] Although extreme precipitation may cause flooding, the two are distinct. Extreme precipitation can bring other storm-related hazards like landslides, strong winds, and lightning. Flooding occurs when there is an excess of water on normally dry land—not just near rivers and lakes.[34] For example, flash floods often occur during heavy rain due to fast-moving run-off. Climate change increases the risk of flooding in California, as prolonged drought reduces the soil's ability to absorb water, warmer atmospheres hold more water vapor for precipitation, and shifting weather patterns can result in more extreme storms.[35] Recently burned areas are vulnerable to landslides after heavy storms, and areas that are low-lying, impermeable, or poorly draining may be more prone to flooding.[36]

Past Events

The County of Riverside's Local Hazard Mitigation Plan emphasizes that flash flooding is a common problem in Riverside County.[1] Several notable events in the past have included Tropical Storm Hillary in 2023, which inflicted downed trees and road flooding in the City of Riverside. Tropical Storm Norbert in 2014 flooded four UCR campus buildings including the Rivera library, which required the evacuation of many books, and science buildings, which required wet carpet and drywall renovation following the storm.[37]

Exposure

UCR sits within the University Arroyo watershed and on a complex drainage system.[38] Box Springs Mountain's precipitation runoff is discharged on its western, UCR-facing slope. Runoff from the reserve and residential neighborhoods is collected along Big Springs Road and routed west through campus in a culvert. Several additional tributaries feed into the main drainage channel before being released into the Gage Canal, which supplies water to local citrus ranches and runs adjacent to UCR's main campus.[39] As depicted in Figure 2, University Wash has been designated as a 1% chance annual flood area, which means it has a one percent chance of experiencing a flood each year and is also referred to as the "100-year floodplain".[40] Water flow stemming from the nature reserve, adjacent residential neighborhoods, and campus itself may contribute to flooding during extreme precipitation events.

Figure 2: FEMA Flood Map shows that the University Wash runs through UCR's campus, creating a zone (Zone AE) with a "1% chance annual flood".

[33] State of California Office of Environmental Health Hazard Assessment. "Precipitation." Text. July 28, 2022. https://oehha.ca.gov/climate-change/epic-2022/changes-climate/precipitation.
[34] National Flood Insurance Program. "What Is a Flood?" Accessed August 20, 2025. https://www.floodsmart.gov/know-your-risk/what-is-a-flood.
[35] UCLA Institute of the Environment & Sustainability. *The Future of Extreme Precipitation in California*. January 7, 2017. https://www.ioes.ucla.edu/project/future-extreme-precipitation-california/.
[36] Sherriff, Lucy. "Climate Change Will Bring Megafloods to California." BBC, February 7, 2024. https://www.bbc.com/future/article/20240207-climate-change-will-bring-a-megaflood-to-california.
[37] "Flash Floods Impact Multiple UCR Buildings." *The Highlander*, October 7, 2014. https://www.highlandernews.org/14397/flash-floods-impact-multiple-ucr-buildings/.
[38] Philip Williams & Associates, Ltd. University Arroyo Flood Control and Enhancement Plan: Summary Report of Hydrologic and Hydrodynamic Conditions and Evaluation of Alternatives. October 9, 2001. https://pdc.ucr.edu/sites/default/files/2019-05/arroyo_report_09oct01.pdf
[39] California State Parks. "Irrigation - The Gage Canal." Accessed August 20, 2025. https://www.parks.ca.gov/?page_id=22584.
[40] FEMA. "Flood Maps." Accessed August 19, 2025. https://www.fema.gov/flood-maps.

Mid-Century (2035-2064): Under a RCP8.5 scenario, UCR is projected to experience an average maximum of 1.27 inches of precipitation per day. This is an eight percent increase from its observed baseline of 1.17 inches of precipitation per day between 1961-1990.[3]

End-of-Century (2070-2099): Under a RCP8.5 scenario, UCR is projected to experience an average maximum of 1.33 inches of precipitation per day. This is a 12 percent increase from its observed baseline of 1.17 inches of precipitation per day between 1961-1990. Precipitation climate models are more uncertain, resulting in smaller differences between mid-century and end-of-century projections. Although precipitation does not change significantly, California will likely see fewer, but more intense storms within a shorter wet season. This underscores the importance of preparing for precipitation changes at UCR.[3]

Future Impacts

Buildings & Facilities: Extreme precipitation events present the potential for flooding across buildings and key facilities. Electrical and other utility equipment located in basements or on ground floors may be damaged. Building access may also be impacted if floodwaters cause elevator equipment and automatic doors to malfunction and create external pressure that impedes regular doors. Extreme precipitation events may also include strong winds that damage building exteriors—roofs, windows, walls—through sheer force or flying projectiles. Flooding and storm events may bring high remediation and repair costs across affected buildings.

Operations & Utilities: Extreme precipitation events that occur during intense storms may impact campus utilities operations. For example, strong winds can damage power lines and cause outages. Flooding may exceed sewage and drain systems capacity, creating backflow issues for the larger campus by flooding buildings from internal plumbing systems. Extreme precipitation and storms may also trigger a flood watch or flood warning, discouraging people from non-essential travel potentially causing classes to be shifted online for students and faculty.

Access: Localized flooding may impede students and staff ability to access campus for school and work, particularly if they rely on public or active transportation. Furthermore, on-campus flooding in parking lots and sidewalks may disrupt access for

disabled community members. Extreme precipitation and storms may also trigger a flood watch or flood warning, discouraging people from non-essential travel.

Athletics Facilities: Facilities with impermeable facilities (track and field, tennis courts) may flood more frequently, which has secondary impacts on practice schedules and sporting events. Storms may also bring additional debris—whether it be organic matter or trash—that require management plans and staff time to clear.

Community Members: Although students and faculty may have the option to shift classes online in the event of extreme precipitation, some campus staff may still be required to go to work to maintain essential campus operations. Flash flooding, which can occur with little warning, may pose an immediate drowning risk to individuals as well as secondary health impacts from contact with polluted water. Flooding may also damage cars, bikes, and other personal possessions, leading to financial strain or emotional distress for students and staff.

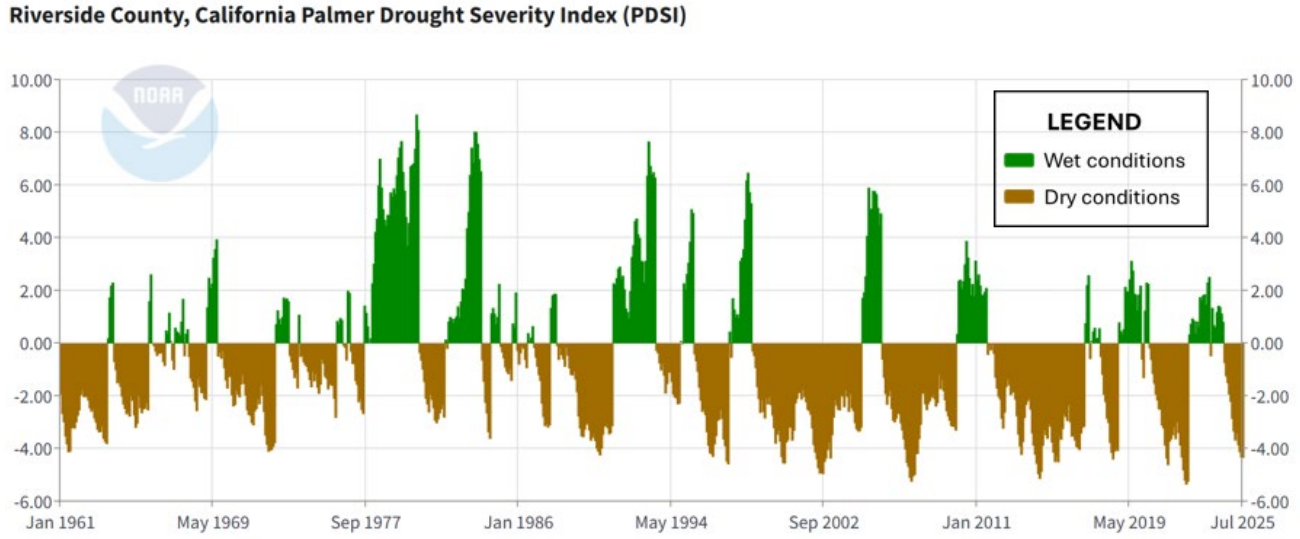
Drought

Drought is a phenomenon that occurs slowly over time where a deficiency in precipitation and other hydrologic conditions create drier-than-normal conditions. Drought has significant impacts for systems most dependent on annual rainfall, with negative implications for agriculture and riverine ecosystems. Water shortages can also affect drinking water systems, quality of life, and increase wildfire risk due to drier ecosystems. Climate change contributes to more frequent and intense droughts because higher temperatures accelerate evaporation from soils and vegetation.[41]

Past Events

California frequently experiences drought, with several recent events occurring between 2012-2016, 2007-2009, and 1987-1992.[41] As seen in Figure 3, Riverside County has experienced cycles of drought since the baseline period of 1961-1990.[42] It is important to note that Riverside County includes desert regions such as Palm Springs, which makes county-level data less accurate compared to UCR's location and geography. In addition, because drought does not occur as a localized event, this assessment does not include UCR-specific risk exposure analysis and the consequences of drought are discussed more broadly than other hazards.

Figure 3: A time series of Riverside County's Palmer Drought Severity Index, which estimates the relative dryness of the region by considering temperature, precipitation, and hydrological factors.



[41] California Department of Water Resources. "Drought." June 9, 2025. https://water.ca.gov/Water-Basics/Drought.
[42] National Centers for Environmental Information (NCEI). "Climate at a Glance | County Time Series." Accessed August 29, 2025. https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/county/time-series/CA-065/pdsi/1/0/1961-2025.

Future Impacts

UCR's location in Southern California—combined with the region's history of drought and rising temperatures driven by climate change—makes future droughts highly likely and poses operational challenges for the university. The City of Riverside supplies roughly 65% of its water from groundwater aquifers in the San Bernardino basin, making the region especially vulnerable to long-term drought and overuse.[43] Groundwater overuse during drought means that natural processes cannot recharge basins at a rate that keeps up with their use. The City of Riverside also receives some water from the Metropolitan Water District and Western Municipal Water District, which source water from the Colorado River and Sacramento-San Joaquin Bay-Delta respectively.[44] Both sources have experienced consequences from drought.

The University of California has set policy goals relating to water use, aiming to reduce growth-adjusted potable water consumption by 36 percent by 2025 compared to a 2005-2008 baseline average.[45] These top-down targets may result in mandates for UCR to reduce its water consumption, which may cause operational challenges if the campus is not prepared for these requirements. With an on-campus student population, utility services, landscaping, and athletics facilities, UCR's substantial water use is vulnerable to prolonged, state-wide drought and administrative water consumption goals.

Conclusion

UCR's geographic location, nature of operations, and community demographics are factors in its overall climate vulnerabilities. These impacts are projected to increase as climate change increases the severity of hazards. Some impacts are localized—for example, very hot days that affect day-to-day routines and strain campus cooling capabilities. Other impacts are from more distant climate events—for example, a wildfire in Los Angeles County that reduces campus air quality or state-wide drought that triggers water use reductions. This vulnerability assessment identifies key climate hazards and the assets most at risk, providing a foundation for future analysis, prioritization, and the implementation of adaptation strategies to strengthen UCR's resilience to both acute and chronic climate events.

[43] UC Riverside Office of Sustainability. "Water." Accessed August 29, 2025. https://riversideca.gov/sustainability/water.
[44] City of Riverside Public Utilities. "About Our Water." Accessed August 29, 2025. https://www.riversideca.gov/utilities/residents/our-water/about.
[45] University of California. "Water." Accessed August 29, 2025. https://www.ucop.edu/sustainability/policy-areas/water/index.html.

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