

June 15, 2020

Subject: Climate Change Research Program Round 3 Recommended Awards

Reporting Period: June 2020

Staff Leads: Leah Fisher and Elizabeth Grassi

Recommended Action:

Staff recommend the Council award \$4,749,952.32 in Greenhouse Gas Reduction Funds (Fiscal Year 2019-2020) for Round 3 of the Climate Change Research Program to the six research proposals identified in the staff report.

Summary:

This staff report describes the California Strategic Growth Council’s (SGC) process for soliciting, receiving, and evaluating research proposals for Round 3 of the Climate Change Research Program (CCR). This report includes a summary of the six (6) projects Staff recommend to the Council for award (see summary in Table 1). The total amount required to fund the six proposals recommended by the Interagency Review Committee exceeds by about one percent (1%) the total funds available. Therefore, Staff recommend awarding each of the recommended applicants approximately 99 percent (~99%) of the total amount they requested.

Table 1: Recommended CCR Round 3 Awards

Institution	Proposal Title	Funding Request	Recommended Award Amount
Humboldt State University	Smoke, Air, Fire, Energy (SAFE) in Rural CA: Energy & Air Quality Infrastructure for Climate-Smart Communities	\$1,000,000	\$990,350.00
University of California, Riverside	Resilient Restoration: Advancing Ecological, Cultural, & Community Resilience with Tribal Nations in Southern California	\$1,000,000	\$990,350.00
University of California, Santa Cruz	Local Development under Climate Change: Evaluating Trade-offs Between Carbon Emissions, Water Sustainability, & Affordable Housing for Communities	\$729,820	\$722,777.24
University of California, Los Angeles	Micro-Climate Zones: Designing Effective Outdoor Cooling Interventions	\$449,425	\$445,088.05
Public Policy Institute of California	Incentivizing Climate-Smart Farmland Transitions in the San Joaquin Valley	\$740,000	\$732,859.00

Institution	Proposal Title	Funding Request	Recommended Award Amount
Physicians, Scientists, & Engineers for Healthy Energy	Toward resilient California communities: A statewide and case-based assessment of solar + storage potential at schools and community centers	\$876,991	\$868,528.04
TOTAL Recommended Awards		\$4,749,952.32	

The six recommended projects propose innovative and partnership-based research approaches to solving policy-relevant research questions. The recommended projects address a broad range of climate issues in partnership with communities and stakeholders in diverse locations across California.

The Round 3 recommendations also bring new research institutions into the SGC research program. Four of the recommended awards are at institutions that have not previously received SGC research funding. These awards also advance SGC's vision for engaged research. Two of the recommended projects fully fund Co-Principal Investigators or Research Leads from outside of the science community – California Native American Tribes (Humboldt State University) and non-profit community organizations (Physicians, Scientists, & Engineers for Healthy Energy). In addition, female researchers lead five of the six projects. One project addresses a shared priority identified as a result of collaboration by 18 Tribes, while stakeholder feedback received during outreach for a Round 1 CCR grant drives the research concept of another project.

Together, these projects reflect our commitment to supporting partnership-based research approaches.

Background:

The Budget Act of 2017 (AB 109. Ting) established the Climate Change Research Program at SGC. To date, the Legislature has appropriated \$34 million of Greenhouse Gas Reduction Fund revenues to support three rounds of CCR research grants. The CCR Program supports “research on reducing carbon emissions, including clean energy, adaptation, and resiliency, with an emphasis on California.”¹ Per statute, the program's [Research Investment Plan](#), adopted by the Council in September 2018, guides the development and implementation of grant cycles as funding becomes available, and provides the foundation for all of the Council's research investments. The plan is on a three-year cycle, with the next update scheduled for 2021.

The CCR Program supports research that advances tangible climate outcomes and that leverages the State's diverse research investments to address policy needs, filling critical research gaps in order to address the State's climate goals. The results of CCR projects will fill knowledge gaps and advance implementation of the State's climate change policies, while also benefiting under-served communities in California. The CCR Program emphasizes meaningful

¹ Assembly Bill 109

engagement, integrating stakeholders – local and regional governments, community-based organizations, and others – into the research process.

Round 3

The Budget Act of 2019 (AB 74, Ting) appropriated \$5 million to SGC to support the third round of the CCR Program. Of this, \$4.75 million is available for awards. After organizing a series of engagement events around the state, conducting conversations with research and program staff in other agencies, and convening the program Steering Committee on two occasions, CCR Staff recommended changes to the Round 3 grant solicitation, which the Council approved in August 2019.

These changes included:

1. **Focusing Round 3 grants on three of the five Research Priority Areas listed in the Research Investment Plan**, due to stakeholder feedback, limited funding compared to past rounds, and to avoid redundancy with other State research programs. The Research Priority Areas are:
 - a. Supporting & protecting vulnerable communities from impacts of climate change.
 - b. Accelerating and supporting transitions to climate-smart communities.
 - c. Integrating land use, conservation, & management into California climate change programs.
2. **Adding guidance to researchers to apply two cross-cutting thematic lenses to proposed research:**
 - a. Research integrating climate vulnerability/adaptation and climate-smart communities.
 - b. Research integrating social dimensions of change into proposed research.
3. **Adding meaningful engagement as a fifth threshold requirement**, specifying that at least one non-academic partner be funded in the project budget, and that engagement is iterative and includes an outreach and communications strategy.
4. **Including additional principles and metrics that researchers and their partners can use to demonstrate value and co-benefits of their work.**

SGC released the grant solicitation for Round 3 on November 15, 2019 and accepted proposals until February 12, 2020. In addition to the changes outlined above, proposals must address the CCR Program's seven goals outlined in the Research Investment Plan:

1. Clear and demonstrated connection to the State's climate change goals.
2. Supports low-income and disadvantaged communities; advances equitable outcomes.
3. Augments, build connections, and fill gaps across current research programs.
4. Produces outcome-based research linked to practical climate action.
5. Engages with the research community, community-based organizations and other stakeholders at every phase of the research.
6. Advances and develops common climate change research platforms.
7. Leverages and complements existing research funding and policy innovations.

Initial threshold review eliminated five (5) of 37 proposals for not meeting requirements. A Technical Advisory Committee evaluated the 32 proposals that passed threshold review and developed consensus recommendations on which proposals the Interagency Committee should consider for funding. The Interagency Committee made the final recommendations presented in this report based on a programmatic and policy-level review that considered the technical merits, how well the proposals connected to the State's climate goals, and how they would advance the goals of SGC's member agencies and SGC itself. [Attachment 2](#) provides additional detail on the review process

Recommended Awards:

Based on the two-phase review process, Staff recommend the Council approve near-complete funding (~99 percent) to the six (6) research grant proposals listed below.

The six proposals recommended for funding will produce valuable research findings and outcomes in partnership with end-users, community groups, and other stakeholders at the completion of the grant, with implications beyond the funded term. All recommended awards scored high during technical review, indicating strong research merit as well as robust meaningful engagement throughout the proposed research. The Interagency Committee selected these six proposals as a holistic suite of projects that complement SGC's ongoing investments in research and communities, as well as other State-funded research, while also advancing innovative research approaches that will facilitate the State meeting its climate goals.

Please refer to [Attachment 1](#) for overviews of each proposal recommended for funding. The key strengths of each proposal are briefly outlined below:

1. **Smoke, Air, Fire, Energy (SAFE) in Rural CA: Energy & Air Quality Infrastructure for Climate-Smart Communities**

Lead: *Humboldt State University*

Partners:

- *Blue Lake Rancheria*
- *Karuk Tribe*

Recommended Award Amount: *\$990,350.00*

The researchers will conduct research in the North State, a region SGC has not previously funded for research. The project focuses on rural resilience, specifically in Tribal communities, but with results replicable in other rural communities. Importantly, the project takes an innovative approach by including Blue Lake Rancheria and the Karuk Tribe as fully funded research leads/co-Principal Investigators, modeling an example of co-production of research that goes beyond being led solely by a PhD researcher. Overall, the project seeks to identify sustainable pathways for climate-smart rural California communities, by developing air quality and energy infrastructure with community members to ensure uptake and applicability.

2. Resilient Restoration: Advancing Ecological, Cultural, and Community Resilience with Tribal Nations in Southern California,

Lead: *University of California, Riverside*

Partners:

- *Climate Science Alliance*
- *Tribal Working Group (collaboration of 18 Southern California tribes)*
- *Intertribal Agriculture Council*
- *San Diego State University*

Recommended Award Amount: *\$990,350.00*

This research project promotes tribal resilience, and the scope of the project reflects a priority shared by 18 Southern California Native American Tribes that work together through this grant, and with researchers, to protect and conserve culturally significant species. The research will advance understanding of the impacts of climate change on a suite of native plant species that serve as the foundation of southern California's biodiversity and are critical to Tribal culture, health, and well-being. The Interagency Committee identified funding for biodiversity research as a current gap. The Committee also selected this project because it implements a scalable vision for the future of the project, incorporating planning for Tribal-led pilot projects as well as capacity building and support to Tribes to identify and access future funding.

3. Local Development under Climate Change: Evaluating Trade-offs Between Carbon Emissions, Water Sustainability, & Affordable Housing for Communities

Lead: *University of California, Santa Cruz*

Partners:

- *U.S. Geological Survey (USGS)*
- *The City of San Luis Obispo*
- *The Central Coast Climate Collaborative*
- *City of Watsonville Community Development Department*
- *County of Santa Barbara Planning and Development*
- *Salinas Valley Basin, Groundwater Sustainability Agency*

Recommended Award Amount: *\$722,777.24*

This research proposal responds directly to Central Coast stakeholder needs identified through engagement activities conducted under a CCR Round 1 award to the same research team. The project involves collaboration by city, county, and other stakeholders in five Central Coast counties to assess trade-offs between carbon emissions from land use change, water shortage availability, affordable housing with a focus on disadvantaged communities, preservation of agricultural lands, and preservation of critical habitats and corridors for species threatened by climate change impacts. The Interagency Committee highlighted that this project is filling a gap in research to inform climate-smart land use planning that also integrates affordable housing and other concerns. The project team will build on existing relationships to obtain input to create locally tailored development models with assessments of impacts and tradeoffs.

4. **Micro-Climate Zones: Designing Effective Outdoor Cooling Interventions**

Lead: *University of California, Los Angeles*

Partners:

- *Kounkuey Design Initiative*
- *Arizona State University*
- *Pacoima Beautiful; City of Ontario; Housing Authority, Los Angeles (Watts Rising)*
- *Southern California Association of Governments*
- *Local Government Commission*
- *Climate Resolve*

Recommended Award Amount: \$445,088.05

This research project will develop recommendations to design cost-effective solutions for heat mitigation at micro-scales for communities, through analysis of stakeholder-engaged data on the relationship between the built environment and temperature. The project also directly builds capacity with residents of disadvantaged communities, ultimately resulting in tangible benefits. The project's goal is to empower disadvantaged communities to implement cooling solutions for bus stops and other streetscapes to facilitate the increased use of transit and active transportation, in order to reduce greenhouse gas emissions and local pollution while creating climate-resilient neighborhoods. The Interagency Committee recommended this proposal for several reasons. The localized approach of the research within communities they are aiming to serve is a strength, as is the integration of community members into the project. Importantly, this project builds on relationships and leverages SGC's investments in three Transformative Climate Communities project areas (Pacoima, Ontario, Watts) and expands into a rural community in the Coachella Valley (Oasis).

5. **Incentivizing Climate-Smart Farmland Transitions in the San Joaquin Valley**

Lead: *Public Policy Institute of California*

Partners:

- *Central Valley Community Foundation*
- *Fresno State University*
- *UC Davis*

Recommended Award Amount: \$732,859.00

This project will support San Joaquin Valley stakeholders in developing beneficial strategies for managing significant land use transitions anticipated from implementation of the Sustainable Groundwater Management Act (SGMA). The Interagency Committee found this to be a timely proposal that will work with many stakeholders and assist local Groundwater Sustainability Agencies in their efforts to implement SGMA. The research will fill gaps in knowledge to support a coordinated approach and prevent ad hoc land fallowing, which can aggravate air pollution and health impacts for vulnerable populations and accelerate the loss of soil carbon. The project will provide information on the benefits and costs of different land management options, estimates of funding needs and potential funding sources for different land uses, and an understanding of how institutions and policies can be structured to facilitate adoption of beneficial approaches.

6. Toward resilient California communities: A statewide and case-based assessment of solar + storage potential at schools and community centers

Lead: *Physicians, Scientists, and Engineers for Healthy Energy*

Partners:

- *Asian Pacific Environmental Network*
- *Communities for a Better Environment*

Recommended Award Amount: \$868,528.04

This project will provide a comprehensive assessment of opportunities to achieve greenhouse gas reductions and resilience benefits through deployment of solar-plus-storage at schools and community facilities across California, informed by community engagement around replicable on-the-ground strategies to site and design projects that reflect community needs. The other research leads, Asian Pacific Environmental Network (APEN) and Communities for a Better Environment (CBE), will work with under-served populations in Richmond and Wilmington to identify specific resilient school and community center sites, develop community engagement strategies, and incorporate community-specific needs and priorities into project designs. The Interagency Committee highlighted the united approach of reducing emissions and increasing resilience in underserved communities as a key factor for funding, along with fully funded community partners and a research co-production model. The Interagency Committee believes the overall approach and focus on implementation and action through this work makes it a unique fit for SGC's funding.

Proposals Not Recommended for Award

The Interagency Review Committee saw merit in each of the 14 proposals that advanced through technical merit review. However, given limited funding availability, the Committee is advancing the six projects described above. The primary reasons that the Committee identified for not recommending proposals for funding primarily include:

- Other potential funding sources for certain topics and areas of research;
- Less clarity or certainty on impacts and results of proposed research, and/or less certainty on replicability outside of research location/community.
- Comparatively weaker partnerships and less-meaningful engagement with partners/stakeholders.

Next Steps

Following the Council's decision, CCR Staff will notify applicants of award decisions; applicants not recommended for award will have 30 days to request a summary review of their proposal. CCR Staff will work with the principal investigators from each awarded research institution to develop grant agreements based on the actual amount awarded, which is recommended at approximately one percent (1%) less than the amount requested. Staff will work with researchers to revise their research scopes and budgets accordingly, adhering to the following guiding principles to ensure that all projects:

1. Remains consistent with the original proposal.
2. Meets the threshold requirements as described in the original submission (facilitates GHG emissions reductions, addresses benefits to disadvantaged and low-income communities, and aligns with the program goals).

3. Continue to address the research priority areas described in the solicitation and addresses key questions, barriers, or opportunities that contribute to advancing it.
4. Demonstrate that these revisions would not have affected the competitiveness of these projects in the review process.
5. Demonstrate a continued commitment to work with partners and stakeholders and deliver a project that features a dynamic, collaborative set of partners.
6. Maintain the percentage of the budget spent on tasks supporting engagement activities or funding for partners, unless lead applicants have full consent of partner organizations to adjust them. Engagement activities must remain consistent in intent and scope with the proposed budget to the fullest extent possible.

Council Recommendation:

CCR Program Staff recommends the Council award \$4,749,952.32 in Greenhouse Gas Reduction Funds (Fiscal Year 2019-2020) for Round 3 of the Climate Change Research Program to the six research proposals identified in this report.

Should the Council agree with staff's recommendation, the following language is suggested:

"I move that the Council approve Fiscal Year 2019-2020 Climate Change Research Program grants to the six research proposals recommended for award at the corresponding amounts identified by program staff in the staff report. Approval of this motion directs CCR Staff to finalize research proposal scopes pursuant to this staff report and the Research Investment Plan."

Attachments:

Attachment 1: Summaries of Round 3 Awards

Attachment 2: Overview of Review Process

Attachment 3: List of 37 proposals received

Attachment 1: Summaries of Round 3 Recommended Awards

Public Policy Institute of California

Incentivizing Climate-Smart Farmland Transitions in the San Joaquin Valley

Principal Investigator: Ellen Hanak (PPIC)

\$732,859.00

Partners:

- Central Valley Community Foundation
- Fresno State University
- UC Davis

CCR Research Priority Area(s) addressed:

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Accelerating and Supporting Transitions to Climate Smart Communities
- Integrating Land Use, Conservation, and Management into Climate Change Programs

Crosscutting Thematic Lenses addressed:

- Social Dimensions of Change
- Integrating climate vulnerability/adaptation with climate-smart approaches

Research Activities:

Building on a previous in-depth study of the region's water-related challenges and solutions, the Public Policy Institute of California proposes an interdisciplinary, solutions-oriented research project to support San Joaquin Valley stakeholders in developing beneficial strategies for managing this significant land use transition. To implement the Sustainable Groundwater Management Act (SGMA), Valley water users will likely need to take at least 500,000 acres (~10%) of irrigated farmland out of production. A coordinated approach is key to regional climate adaptation and statewide mitigation efforts. Ad hoc land fallowing can leave soils exposed—aggravating air pollution and health impacts for vulnerable populations and accelerating the loss of soil carbon. This research will fill gaps in knowledge that hinder the implementation of a coordinated approach to managing idled lands, including: information on the benefits and costs of different land management options; estimates of funding needs and potential funding sources for different land uses; an understanding of how institutions and policies can be structured to facilitate adoption of beneficial approaches. The project will also bring together diverse stakeholders who must be involved to implement elements of the approach.

Facilitates Greenhouse Gas Emissions Reductions:

A climate-smart San Joaquin Valley must enable cost-effective reduction of greenhouse gas emissions. This research activity to synthesize knowledge about dryland cropping systems and soil carbon will illuminate opportunities for emissions reductions on lands not targeted for renewable energy investments. As mentioned above, this type of synthesis is needed because current understanding does not support a robust accounting for emissions reductions benefits. The project will also explore barriers and solutions to responsible solar energy development in the San Joaquin Valley.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

The project involves partnerships between research organizations, the Central Valley Community Foundation, and a wide cross-section of Central Valley stakeholders. Ongoing engagement with stakeholders will ensure development of relevant, actionable findings about land management options that lead to implementable and scalable solutions, and to help build shared understanding among diverse groups about how new approaches to coordinate land use decisions can generate greater benefits than business-as-usual approaches. The research will deliver benefits to vulnerable and low-income communities through preventing creation of air pollution from unmanaged lands, as well as by improving water security for communities in the region that are already facing water scarcity and insecurity under climate change.

University of California, Riverside**Resilient Restoration: Advancing Ecological, Cultural, and Community Resilience with Tribal Nations in Southern California**

Principal Investigators: Helen Regan and Janet Franklin (UC Riverside)

\$990,350.00

Partners:

- San Diego State University
- Climate Science Alliance
- Tribal Working Group (collaboration of 18 Southern California tribes)
- Intertribal Agriculture Council

Research Priority Area(s) addressed:

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Integrating Land Use, Conservation, and Management into Climate Change Programs

Crosscutting Thematic Lenses:

- Social Dimensions of Change
- Integrating climate vulnerability/adaptation with climate-smart approaches

Research Activities:

The objective of this project is to promote Tribal resilience by developing knowledge and supporting actions that enhance persistence of cultural practices with a focus on preserving the ecosystems and species that are integral to tribal communities. The research will advance understanding of the impacts of climate change on a suite of native plant species that serve as the foundation of southern California's biodiversity and are critical to Tribal culture, health, and well-being. Research activities will assess the vulnerability of a suite of culturally significant plants to climate change impacts, inform restoration actions to maintain biodiversity, increase food security, and ensure that the Tribes have access to culturally significant plants for their health, wellness, and tribal practices. The project will also identify and provide seed funding for pilot projects to test restoration and climate adaptation strategies on Tribal Lands and build capacity for tribal professionals, community members and youth.

Facilitates Greenhouse Gas Emissions Reductions:

By informing climate adaptation through restoration and preservation of native ecosystems and culturally significant native plants, particularly oaks and riparian forest species, our project will also facilitate the reduction of greenhouse gases (GHGs). Implementing climate adaptation and restoration activities in these natural systems can increase carbon stocks, prevent further degradation of carbon sink ecosystems, and maintain landscape spatial heterogeneity and diversity.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

Climate adaptation planning is critical to communities living at the wildland-urban interface, notably for the 18 federally recognized Tribes in southern California. This research will inform adaptation planning and implementation, supporting the unique needs of underserved tribal communities with integration and consideration of cultural resilience throughout the work. The project addresses a priority identified by the tribal communities directly, and furthermore, through an interdisciplinary research-tribal partnership, this project will facilitate capacity building for tribes through intertribal coordination.

University of California, Santa Cruz**Local Development under Climate Change: Evaluating Trade-offs Between Carbon Emissions, Water Sustainability, & Affordable Housing for Communities**

Principal Investigators: Ruth Langridge (UCSC) and Tamara Wilson (USGS)

\$722,777.24

Partners:

- U.S. Geological Survey (USGS)
- The City of San Luis Obispo
- The Central Coast Climate Collaborative
- City of Watsonville Community Development Department
- County of Santa Barbara Planning and Development
- Salinas Valley Basin, Groundwater Sustainability Agency

Research Priority Area(s) addressed:

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Accelerating and Supporting Transitions to Climate Smart Communities

Crosscutting Thematic Lenses:

- Integrating climate vulnerability/adaptation with climate-smart approaches

Research Activities:

Land use and land cover (LULC) have impacts on carbon emissions and climate vulnerability for communities and ecosystems. Future development may exacerbate water shortages as climate change intensifies droughts, but development is needed to create affordable housing in California. The Central Coast exemplifies these issues as an understudied region with significant climate change vulnerability. This project will for the first time link the UPlan urban growth model to the Land Use And Carbon Scenario simulator (LUCAS) model to jointly estimate urban development, carbon emissions, and water demand, and link these development plans to estimates of their impacts on affordable housing, displacement, and protection of important lands. Most displacement mapping efforts focused on urban centers; this research will expand analysis to Central Coast small rural towns. The model will allow for rapid assessment of tradeoffs between State and local goals, and identify win-win planning strategies applicable to groundwater-dependent regions throughout California. The model will be widely transferable as these tools are already used by agencies throughout California.

Facilitates Greenhouse Gas Emissions Reductions:

Land use has a key impact on carbon emissions that are largely due to conversions of natural land covers to agriculture or development. This project will use the LUCAS simulator to project changes in ecosystem carbon balance using a scenario tradeoff analysis. The project will produce unprecedented high-resolution regional estimates of carbon fluxes to provide a baseline for evaluating future mitigation, and to assess tradeoffs between low-emission development and other sustainable development goals.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

This project will work with Central Coast disadvantaged rural communities that are vulnerable to water shortages under climate change, but have an interest in sustainable development due to a lack of affordable housing. Stakeholders identified affordable housing and development as a key priority in a previous SGC grant. The project will benefit DACs by mapping and integrating community concerns with both water and affordable housing, producing maps of areas vulnerable to displacement, exclusion, and gentrification, and improving upon previous work by linking resident vulnerability with the housing stock and water issues. The project also will empower county and municipal planners to meet affordable housing goals to minimize emissions while fostering sustainable development.

Humboldt State University**Smoke, Air, Fire, Energy (SAFE) in Rural California: Energy and Air Quality Infrastructure for Climate-Smart Communities**

Principal Investigators: Peter Alstone (HSU), Jana Ganion (Blue Lake Rancheria), Lisa Hillman (Karuk Tribe)

\$990,350.00

Partners:

- Blue Lake Rancheria
- Karuk Tribe

Research Priority Area(s):

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Accelerating and Supporting Transitions to Climate Smart Communities
- Integrating Land Use, Conservation, and Management into Climate Change Programs

Crosscutting Thematic Lenses:

- Social Dimensions of Change
- Integrating climate vulnerability/adaptation w/climate-smart approaches

Research Activities:

The project's overall goal is to identify sustainable pathways to climate-smart rural California communities through development of energy and air quality infrastructure that integrates communities and social dimensions of change. This study will focus on the role of smoke, air, fire, and energy systems in rural communities. With an interdisciplinary approach, the researchers will identify near-term investments and community development activities that are consistent with long-term sustainability. The research team will develop engineering design tools and management strategies that can accelerate deployment of energy and air quality infrastructure systems at three scales: households, critical community facilities, and isolated community clusters of 10-50 households and businesses. The project will also work directly with community members and leaders to advance understanding of the social dimensions of climate-smart and fire-smart infrastructures and practices. Finally, the project will advance sustainable university-community research partnerships by assessing the institutional needs and opportunities for universities to play a supportive, long-term role in connecting indigenous communities in their region with resources for environmentally just community development and research.

Facilitates Greenhouse Gas Emissions Reductions:

Enabling the deployment of clean technologies in rural communities will reduce emissions, specifically by setting up clean energy microgrids that support renewables integration and avoid fossil fuel combustion during blackouts in backup generators. The project will also focus on identifying infrastructure that supports indigenous land use and prescribed fire, resulting in additional emissions reduction and sequestration through reduced catastrophic wildfires and improvements in forest health.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

This work is explicitly focused on meeting the needs of rural indigenous communities in Northwest California. These are among the most underserved and historically disadvantaged communities in California. Many of these communities still face a lack of infrastructure investment, economic opportunity, and access to healthy food among other challenges. There is also significant exposure to air pollution from forest fire smoke, particularly in upriver forest communities where atmospheric inversion layers can trap pollution for days or longer. The project objectives aim to support a just transition to clean energy and air systems, which could support local economic opportunity and reduce exposure to harmful pollution.

University of California, Los Angeles**Micro-climate Zones: Designing Effective Outdoor Cooling Interventions**

Principal Investigator: V. Kelly Turner

\$445,088.05

Partners:

- Kounkuey Design Initiative
- Arizona State University
- Pacoima Beautiful; City of Ontario; Housing Authority, City of Los Angeles (Watts Rising)
- Southern California Association of Governments
- Local Government Commission
- Climate Resolve

Research Priority Area(s):

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Accelerating and Supporting Transitions to Climate Smart Communities

Crosscutting Thematic Lenses:

- Social Dimensions of Change
- Integrating climate vulnerability/adaptation w/climate-smart approaches

Research Activities:

This project will conduct a comparative analysis of micro-scale cooling strategies in Oasis/Coachella Valley, Ontario/Inland Valley, Pacoima, and Watts/South Los Angeles - four historically disadvantaged communities that are vulnerable to extreme heat. These communities represent a range of climate zones and built environment forms in Southern California. The project will leverage ongoing community engagement and partnerships between UCLA and the Transformative Climate Communities of Ontario, Pacoima, and Watts, and as well as between Kounkuey Design Initiative and the community of Oasis in Riverside County. Through analysis of community-engaged data on the relationship between the micro-scale environment and temperature, researchers will develop design recommendations to help municipalities and communities most cost-effectively mitigate heat at bus stops and other streetscapes. The objective of this project is to empower communities, particularly disadvantaged and heat vulnerable communities, to cost-effectively design cooling solutions for bus stops and other streetscapes that facilitate the use of transit and active transportation, in order to reduce greenhouse gas emissions and local pollution while creating climate-resilient neighborhoods.

Facilitates Greenhouse Gas Emissions Reductions:

Increasing transit ridership and active transportation are critical to reducing GHG emissions, but future extreme heat could make walking and waiting at transit stops less desirable and pose health risks. Little guidance focuses on the street-level, where cities need to act to address heat. This research will result in guidance on how to best design cooling solutions that facilitate emissions reductions from transportation.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

Low-income and disadvantaged communities suffer disproportionately from extreme heat and other climate impacts. California communities need help to design the most cost-effective cooling intervention for transit riders, pedestrians, and other residents. This project will empower four disadvantaged communities to help fill this research and guidance gap. For example, community members in East Coachella Valley will inform the design of shade structures at bus stops, and then participate in data collection on temperature reductions based on the installation. Guidance will be produced to benefit other communities on how to minimize costs while maximizing the cooling benefits of shade structures, vegetation, and more.

Physicians, Scientists, and Engineers for Healthy Energy**Toward Resilient California Communities: A statewide and case-based assessment of solar + storage potential at schools and community centers**

Principal Investigators: Elena Kreiger (PSE), Ameer Ravel (APEN), Laura Gracia-Santiago (CBE)
\$868,528.04

Partners:

- Asian Pacific Environmental Network (APEN)
- Communities for a Better Environment (CBE)

Research Priority Area(s):

- Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
- Accelerating and Supporting Transitions to Climate Smart Communities

Crosscutting Thematic Lenses:

- Social Dimensions of Change
- Integrating climate vulnerability/adaptation w/climate-smart approaches

Research Activities:

This research will evaluate the potential for community solar + storage to align California's emissions reductions goals with the urgent need to increase local resilience, especially within disadvantaged communities. The project will evaluate solar + storage potential at schools and community centers statewide, complementing this analysis with detailed project design and community engagement in Richmond (East Bay Area) and Wilmington (Los Angeles), an effort led by APEN and CBE. At the state level, solar + storage potential on school buildings and community centers will be assessed, along with evaluating the design parameters needed to meet critical electric loads in the event of earthquakes, wildfires, public safety power shutoffs, or other disaster-induced electricity outages. Finally, analysis will be performed on demographics and vulnerability metrics for populations in proximity to these sites to inform deployment scenarios and priorities. On the community level, the project will work closely with underserved populations in Richmond and Wilmington to identify specific community center sites, develop community engagement strategies, and incorporate community-specific priorities into project designs. Data from the statewide analysis will be synthesized to support community efforts, and community-level findings will refine the state analysis. The coupled analyses will inform grounded recommendations for developing resilient solar + storage systems at schools and other community sites statewide.

Facilitates Greenhouse Gas Emissions Reductions:

Distributed solar + storage can reduce greenhouse gas emissions during normal grid operation by displacing fossil fuels and facilitating renewable energy integration. This project will analyze the greenhouse gas reduction potential of solar + storage projects at schools and community centers statewide, and their impact on average and marginal grid emissions while helping catalyze on-the-ground solar + storage deployments.

Benefits Disadvantaged, Low-Income, and/or Underserved Communities:

A key research objective is to develop scenarios for strategic solar + storage deployment at schools and community centers that prioritize resilient site access for disadvantaged and vulnerable populations. The project will develop these scenarios by evaluating various demographic, socioeconomic, and vulnerability metrics such as frequency of power outages, frequency of school closures, wildfire risk, air conditioning access, electricity-dependent medical needs, and heatwave risks. This effort is bolstered by partnership with APEN and CBE on community engagement and developing resilient site designs in Richmond and Wilmington. Direct community input will be incorporated into statewide analyses, and engagement strategies synthesized and disseminated to support low-income and disadvantaged communities via similar efforts across the state.

Attachment 2: Round 3 Evaluation Process

SGC received 37 research proposal submissions from principal investigators representing campuses affiliated with the University of California and California State University system, as well as from one national lab, two private universities, and six non-profit research institutions (see Tables 3A and 3B below; individual proposals listed in [Attachment 3](#)).

Thirty-two (32) of the 37 submissions passed the threshold review for completeness and compliance with the program's threshold requirements to facilitate greenhouse gas emissions reductions and benefit disadvantaged and low-income communities.

Threshold requirements are as follows:

- 1) Adhere to the Program's budget and application requirements;
- 2) Align and contribute to the Program's seven goals;
- 3) Demonstrate direct or indirect reduction of GHG emissions in California;
- 4) Demonstrate direct or indirect benefits to low-income and disadvantaged communities;
- 5) Fund at least one non-academic partner, and include iterative engagement and an outreach and communications strategy.

The 32 proposals reviewed cut across the three Research Priority Areas and many incorporated the Crosscutting Thematic Lenses:

- Sixteen of the 32 proposals reviewed addressed all three Research Priority Areas; 10 addressed two of three.
- Eighteen of the 32 proposals reviewed integrated both Crosscutting Thematic Lenses into the proposed work. Ten addressed the intersections of adaptation and reduction of emissions, and three integrated social dimensions of change.

The proposals also span a diverse set of research topics, falling under the three Research Priority Areas. Please see Table 3A for more information on these topics.

Tables 3A and 3B: Summary Information on Submitted Research Proposals

Submitted	Advanced	Research Topics
7	4	Energy & Transportation
7	5	Climate Hazards & Community Needs/Resilience
6	1	Agriculture & Water
4	0	Forest Science & Management
4	2	Land Use & Sustainable Communities
3	2	Heat
1	0	Miscellaneous (Manufacturing)
33	14	TOTAL

Submitted	Advanced	Lead Organization
5	2	California State University
18	5	University of California
2	0	Private Universities
1	0	National Labs
6	4	Non-Profit Research Institutions

Technical Merit Review

A Technical Advisory Committee composed of 19 experts from around the country conducted the technical merit review of the 32 applications that passed threshold review. Reviewers represented diverse expertise, ranging from applied climate research to research for recovery and community development, as well as specialization in engaged research, participatory approaches, and partnering with indigenous peoples to incorporate traditional knowledge. The technical merit review focused on the extent to which each proposal demonstrated research merit (65% of score) and meaningful engagement of partners and stakeholders (35% of score).

Research merit refers to the degree that a proposal addressed the following criteria:

- Advances California's climate goals, including the State's 2030 and 2050 climate goals, and the seven program goals outlined in the Research Investment Plan.
- Addresses one or more of the three Research Priority Areas, and clearly demonstrates potential impact for partner(s)/stakeholders.
- Advances the science or discipline using state-of-the-art methods with a technically feasible approach, as well as addressing potential limitations or challenges, and including defined milestones and metrics to track progress;
- Research leads and team are well qualified to execute proposed research project.

Meaningful engagement refers to the degree that a proposal addressed the following criteria:

- Provides direct and indirect benefits to priority populations.
- Incorporates strong and meaningful partnerships that engage diverse participants at all stages; addresses a need identified by the audience/community of focus.
- Demonstrates how relationships will be built with new partners; new partners influence projects' designs, including processes to disseminate findings.
- Advances goals of engaged audiences through assistance and resource sharing.
- Demonstrates established multi-stakeholder or multi-institutional partnership with a collaborative structure to advise/oversee project's progress and application of findings.
- Features an iterative engagement plan that includes communities/end-users, who have been included in planning and will be brought into research process and execution.

Based on these criteria, reviews, and a two-day remote meeting during which Committee members discussed the merits of submitted proposals, the Advisory Committee recommended that the Interagency Committee consider 14 proposals for funding. The Advisory Committee's elevation of these proposals indicated that they are technically strong and worthy of funding.

Programmatic Review

A 10-member Interagency Committee, including representatives from the California Environmental Protection Agency, California Air Resources Board, California State Water Resources Control Board, California Natural Resources Agency, California Department of Conservation, the Governor's Forest Management Task Force, California Energy Commission, California Public Health Institute/California Department of Public Health, California Department of Food and Agriculture, and Governor's Office of Planning and Research conducted a

programmatic and policy-level review of the 14 research proposals that passed technical merit review.

Each Interagency Committee member conducted an in-depth review of four to six of the 14 proposals and participated in a one-day remote review meeting to discuss programmatic and policy considerations, the technical merit reviews, and the connection these research proposals have to the State's climate goals, as well as goals of SGC and its member agencies.

The Interagency Committee evaluated proposals along the following dimensions:

- Alignment with State goals, and research and policy priorities;
- Balance and distribution of funds, considering geography as well as type of institution, partners, and research topics;
- Partnerships and/or participation of targeted groups;
- Avoiding potential duplication of investment with other current or planned research investments from other departments and agencies;
- Project management, quality assurance, and cost effectiveness; and
- Potential for increased employment and/or economic growth in low-income, disadvantaged, or underserved communities in California.

Following deliberation, the Interagency Committee developed the proposed recommended awards list. The total amount required to fund the six proposals recommended by the Interagency Review Committee exceeds by about one percent (1%) the total funds available. Therefore, the Committee recommends awarding each of the recommended proposals approximately 99 percent (99%) of the total amount each requested.

Appendix 3 Climate Change Research Program: Round 3 Submitted Proposals

Appendix 3: Climate Change Research Program Round 3 Submitted Proposals

Lead Organization	Proposal Title	Partners	Amount Requested
Public Policy Institute of California	Incentivizing Climate-Smart Farmland Transitions in the San Joaquin Valley	Central Valley Community Foundation; California State University, Fresno	\$740,000
University of Southern California	Evaluating the impact of greening public schoolyards on climate change resilience	Los Angeles Unified School District; Los Angeles Department of Recreation & Parks	\$998,279
University of California, Berkeley	The Economics of Agricultural Adaptation and Mitigation to Climate Change and Water Scarcity	California Department of Water Resources; Nicolaus Nut Company; University of California Cooperative Extension; Environmental Defense Fund; Sustainable Conservation; California Rural Legal Assistance	\$600,566
University of California, Davis	Local control and big data for climate-ready cities	Local Government Commission; American Planning Association; Center for Regional Change; Valley Vision; California Rural Legal Assistance	\$245,122
Stanford University	Adaptive management for catastrophic wildfire risk management in California's zombie forests	iNaturalist; Sierra Nevada Alliance	\$513,106
Point Blue Conservation Science	Transforming land use decisions to minimize wildfire impacts on vulnerable communities, ecosystems, and carbon loss	George Washington University; Conservation Biology Institute; Paradise Recreation and Park; National Park Service; Sage Underwriters	\$999,154
University of California, Los Angeles	Prototype designs of low-carbon, resilient energy systems at multiple scales for under-resourced communities	University of California, Merced; The Energy Coalition; Central Valley Air Quality Coalition; Pacoima Beautiful; East Yard Communities for Environmental Justice	\$1,000,000
University of California, Riverside	Resilient Restoration: Advancing Ecological, Cultural, and Community Resilience with Tribal Nations in Southern California	San Diego State University; Climate Science Alliance; Tribal Working Group	\$1,000,000
University of California, Los Angeles	Labor, Extreme Heat, and Adaptation to Climate Change: Occupational Heat Exposure and California's Low-Income Workers	Warehouse Workers Resource Center; Garment Worker Center; Community Labor Environmental Action Network; Instituto de Educacion Popular del Sur de California; Southern California Coalition for Occupational Safety and Health	\$417,811

Lead Organization	Proposal Title	Partners	Amount Requested
University of California, Davis (LAWR)	Co-Developing Local Climate Adaptation Institutions	The Sierra Fund; Lowlander Center; Asian Pacific Environmental Network; Sogorea Te Land Trust; Kumeyaay Diegueno Land Conservancy	\$999,649
University of California, Santa Cruz	Local Development under Climate Change: Evaluating Trade-offs Between Carbon Emissions, Water Sustainability, and Affordable Housing for Communities	U.S. Geological Survey; The City of San Luis Obispo; The Central Coast Climate Collaborative; City of Watsonville Community Development; County of Santa Barbara Planning Department; Salinas Valley Groundwater Basin Management District	\$729,820
University of California, Berkeley	Double jeopardy: Assessing wildfire risk and recovery efforts in California	University of California, Los Angeles; California State University, Chico; North Bay Organizing Project; Rebuild Paradise Foundation; U.S. Green Building Council LA	\$899,999
University of California, Merced	Strategic Land Use Research Planning for Climate Adaptation and Groundwater Sustainability	Merced County Farm Bureau; University of California Cooperative Extension; Cortez Growers Association; Environmental Defense Fund; Merced Irrigation District	\$275,000
Lawrence Berkeley National Laboratory	Evidence-based forest resource planning for climate action in Sierra County: Enabling economic and fire resilience for rural communities in California	Schatz Energy Research Center; University of California, Berkeley; Sierra Business Council; Sierra County	\$1,000,000
Humboldt State University	Smoke, Air, Fire, Energy in Rural California: Energy and Air Quality Infrastructure for Climate-smart Communities	Blue Lake Rancheria; Karuk Tribe	\$1,000,000
University of California, Los Angeles	Micro-climate Zones: Designing Effective Outdoor Cooling Interventions	Kounkuey Design Initiative; Arizona State University; City of Ontario; Pacoima Beautiful; Local Government Commission; Southern California Association of Governments; Los Angeles Housing Authority	\$449,425
Santa Clara University	Integrating riparian restoration into California's GHG strategy: improved methods for assessing carbon storage in floodplain forests	Bountiful (formerly Vinsight); River Partners; American Rivers; U.S. Fish and Wildlife Service; Reclamation District 2092	\$414,190
University of California, Berkeley	Understanding the impact of Public Safety Power Shutoff (PSPS) on food waste and food security among vulnerable populations in California	University of California Agricultural Natural Resources; University of California, Davis; California Food Policy Advocates; California WIC Association; California Association of Food Banks	\$999,812

Lead Organization	Proposal Title	Partners	Amount Requested
Sonoma State University	Advancing Climate Adaptation Strategies and Tools in Co-Creation with Vulnerable Cultural Communities	Pepperwood Foundation; Los Cien; PEP Housing; United Way of the Wine Country; Capital Science Communicators	\$987,839
California State University, Northridge	Engaging communities to improve shade tree survival in low income areas vulnerable to extreme heat	Los Angeles County Department of Public Health; TreePeople; Los Angeles Conservation Corps; Urban Strategies; From Lot to Spot	\$740,550
University of California, Los Angeles	Development and piloting of community wildfire risk abatement programs	Tree People; RAND Corporation; North Topanga Canyon Fire Safety Council; U.S. Forest Service; The Nature Conservancy	\$968,811
California State University, Dominguez Hills	Smart food for a smart climate: sustainable diet education in California	California State Polytechnic University, San Luis Obispo (CalPoly); California State University, Channel Islands; California State University, Chico; California State University, Fullerton; California State University, Long Beach; California State University, Sacramento; University of California, Los Angeles; Westside Food Bank; California Partnership for the San Joaquin Valley Development Center	\$967,873
Point Blue Conservation Science	Transitioning from planning to action with nature-based resilience for the Santa Cruz coast	City of Santa Cruz; Virtual Planet; San Jose State University; GHD	\$885,963
University of California, Davis	Equitable and climate neutral Sacramento Region	City of Sacramento; City of West Sacramento	\$750,000
University of California, Irvine	Developing adaptive strategies toward climate-ready infrastructure systems in California	Los Angeles Regional Collaborative for Climate Action and Sustainability; Irvine Ranch Water District; Orange County Water District; Los Angeles Metro; Orange County Sanitation District	\$600,000
University of California, Davis	Focused managed aquifer recharge near disadvantaged communities to build a climate resilient water supply	Lawrence Livermore National Lab; Selfhelp Enterprises	\$999,952
University of California, Berkeley	Community-centric expansion of low-income shared mobility and public transit pilot projects	City of Oakland Department of Transportation; City of San Jose; TransForm; Los Angeles Walks; Bird	\$683,398
University of California, Davis	Climate action implementation testbed	Local Government Commission	\$972,112

Lead Organization	Proposal Title	Partners	Amount Requested
University of California, Davis	Evaluation of the climate and equity benefits of scaling community-based carsharing in Los Angeles County	Mobility Development Partners; Polytechnique Montréal; City of Los Angeles; Southern California Association of Governments	\$300,000
University of California Berkeley	Solar rooftop photovoltaic potential by land use type to meet electricity demands across California's disadvantaged communities	GRID Alternatives	\$509,873
California State University, Fullerton	Integrating Internet-of-Things and remanufacturing industries in Southern California: transition towards circular manufacturing implementation	ROMAC Industries	\$304,985
Pacific Institute	Maximizing the climate adaptation and mitigation benefits of safe drinking water projects in California	University of California, Los Angeles Luskin Center; Leadership Counsel for Justice and Accountability; EnvironmentNow	\$500,614
Physicians Scientists and Engineers for Healthy Energy	Toward resilient California communities: a statewide and case-based assessment of solar + storage potential at schools and community centers	Asian Pacific Environmental Network; Communities for a Better Environment	\$876,991
University of Southern California	Linking human dimensions with climate mitigation and adaptation to transition vulnerable regions in Southern California to climate smart communities	Indicia Consulting LLC; Altostratus Inc.; Climate Resolve	\$845,000
San Diego State University	Seaweed, feed and manure management: Achieving comprehensive reduction of California's agricultural methane emissions	University of California Cooperative Extension of Imperial Valley; Kings County Economic Development Corporation	\$403,387
California State Polytechnic University, Pomona	CSU5 adaptive development strategies for disadvantaged communities in response to climate change: a multi-scale water-energy-food nexus investigation	City of Los Angeles; California State University, Los Angeles; California State University, Northridge	\$997,039
Sierra Institute for Community and Environment	Confronting climate change in the Sierra Nevada: advancing science integration and collaborative practice to build resilient landscapes and communities	University of Washington; Birkhoff and Associates	\$882,839
		Total Requested Funding:	\$27,459,159