Berkeley Law | Center for Law, Energy, & the Environment

ADVANCING *Climate Adaptation*

Findings from California's Adaptation Planning Grant Program

JUNE 2024

Policy Report

CLIMATE & ENERGY

WATER

OCEANS

LAND USE

ABOUT THIS REPORT

The Center for the Law, Energy & the Environment (CLEE) developed this report for the Governor's Office of Planning and Research (OPR) to assess the Adaptation Planning Grant Program (APGP). APGP is a grant program administered by the Integrated Climate Adaptation and Resiliency Program (ICARP) at OPR. The report includes a review of adaptation funding literature, a landscape analysis of State programs facilitating local and regional adaptation actions, an analysis of Round 1 program engagement and award data, and interviews with 14 program grantees, including four case studies. This report provides an initial assessment of the first round of APGP and makes recommendations for future iterations of APGP, as well as the continued improvement of adaptation funding in California.

CLEE conducted interviews with program grantees to prepare this report with an assurance of confidentiality. Therefore, interviewees will be referred to as "Interview with APGP Round 1 Grantee" throughout the report.

THE CENTER FOR LAW, ENERGY & THE ENVIRONMENT

The Center for Law, Energy, and the Environment (CLEE) has a mission to make climate policy work, focusing on pressing topics to deliver on policy goals. CLEE works with government, business, and the nonprofit sector to help solve urgent problems requiring innovative, often interdisciplinary approaches. Drawing on the combined expertise of faculty, staff, and students across the University of California, Berkeley, CLEE strives to translate empirical findings into smart public policy solutions to better environmental and energy governance systems.

THE INTEGRATED CLIMATE ADAPTATION AND RESILIENCY PROGRAM

The Integrated Climate Adaptation and Resiliency Program (ICARP) (PRC 71350-71360) drives California's response to climate impacts, prioritizing equitable approaches that integrate mitigation and adaptation. ICARP's home within the Governor's Office of Planning and Research (OPR) enables the State to coordinate across local, regional, and state efforts to support cohesive strategies.

DESIGN

Template design and layout:
Jordan Rosenblum

Document design and layout:
Odd Moxie

Image credits:
Adobe Stock

JUNE 2024 | POLICY REPORT

ADVANCING CLIMATE ADAPTATION

Findings from California's Adaptation Planning Grant Program

AUTHORS

Hanna Payne
CLIMATE RESEARCH FELLOW

Shruti Sarode
CLIMATE RESEARCH FELLOW

Kasia Dahlbeck
CLIMATE RESEARCH FELLOW

Louise Bedsworth
EXECUTIVE DIRECTOR

Berkeley Law | Center for Law, Energy, & the Environment

ACKNOWLEDGMENTS

The authors would like to thank the Adaptation Planning Grant Program staff for their partnership in developing this evaluation and for providing engagement and grant data. We would also like to thank the APGP Round 1 grantees who participated in interviews with the authors on project development and program experience; and the many adaptation and resiliency planning experts who provided insights and feedback through interviews and email correspondence to inform the analyses in this report.

TABLE OF CONTENTS

GLOSSARY OF TERMS

Adaptive capacity: The ability to moderate the potential damages or take advantage of the opportunities from climate change.

California Disadvantaged Communities: Designation at the census tracts level to identify the areas most affected by pollution and the people most vulnerable to its effects based on geographic, socioeconomic, public health, and environmental hazards criteria.[1]

California Native American tribe: Federally recognized California Native American tribe or a non-federally recognized California Native American that is on the contact list maintained by the Native American Heritage Commission for the purposes of Chapter 905 of the Statutes of 2004.[2]

Climate adaptation: Action to prepare for and adjust to the current and projected impacts of climate change.

Climate resilience: Capacity of a system to maintain function in the face of stresses imposed by climate change and to adapt the system to be better prepared for future climate impacts. A community's resilience is determined by its ability to survive, adapt, and thrive no matter what acute shock or chronic stressor it experiences.

Climate stressor: A condition, event, or trend related to climate variability and change that can exacerbate hazards.

Climate vulnerability: Degree to which natural, built, and human systems are at risk of exposure to climate change impacts.

Equitable climate adaptation planning: Process that includes identifying and centering persons who may be most vulnerable to climate change and ensuring that planning processes, distribution of resources, and efforts to address systemic wrongs are all conducted in an equitable manner.

Equity-oriented planning: Planning process that acknowledges and seeks to address the disparities in how communities experience both the benefits and burdens of climate change.

Integrated climate adaptation and resilience solutions: Actions that both reduce greenhouse gas emissions (mitigation) and build resilience to climate impacts (adaptation).

Integrated financing: Practice of strategically linking climate adaptation planning with state or federal infrastructure grants or other longer-term financing solutions to enhance capacity and develop sustainable funding mechanisms that extend beyond initial project phases.

Integrated planning: Planning process that emphasizes both mitigation and adaptation strategies for building resilience while aligning adaptation planning with other concurrent planning processes.

Justice40: White House initiative to ensure that 40% of the overall benefits from federal investments in areas such as clean energy, climate resilience, and environmental remediation are directed to disadvantaged communities.[3]

Justice40 Communities: Disadvantaged communities that benefit from the Justice40 initiative.[4] These typically include low-income communities, communities of color, and all Federally Recognized Tribes that have historically borne the brunt of environmental pollution and other systemic injustices.

Maladaptation: Outcome when an adaptation action results in increased exposure and sensitivity to climate change impacts, causing communities to become even more likely to be negatively affected by climate change.

Shovel-ready projects: Projects that have undergone the necessary planning and permitting requirements and are immediately ready for implementation.

Vulnerable communities: Groups who experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality.[5]

EXECUTIVE SUMMARY

California already faces myriad climate risks associated with warming conditions and extreme weather events. Climate impacts such as wildfire, sea-level rise, extreme heat, drought, and extreme precipitation carry significant costs to human lives and livelihoods, including infrastructure damage, insurance costs, and the disruption of critical industries.

The need for adaptation planning: Preparing for climate risks requires investments in adaptation, including a comprehensive planning phase underpinning strategy implementation. Investing in climate adaptation is proven to reduce the costs of climate change by protecting valuable infrastructure and industry.[6] Investing in adaptation planning specifically builds the capacity of vulnerable communities to prepare for climate hazards, addressing the equity gap in the adaptation funding landscape.

Assessment of APGP: The Adaptation Planning Grant Program (APGP), administered by the Integrated Climate Adaptation and Resiliency Program (ICARP) in the California Governor's Office of Planning and Research (OPR), addresses local, regional, and tribal planning needs by supporting communities statewide in developing adaptation projects that address climate risks and strengthen resilience. This report provides an initial assessment of APGP's first round, identifying program engagement and award distribution trends, highlighting four grantee case studies, and providing recommendations for future rounds of APGP. The report analyzes these findings in the broader context of California's adaptation funding landscape, presenting further recommendations for the State to advance an integrated and equitable adaptation funding strategy.

Recommendations for APGP:

- **Continue to enhance program accessibility and transparency** through expanding technical assistance for navigating application processes, continuing to implement advanced pay structures, and implementing processes for feedback provision to unawarded applicants.

- **Continue to support soft infrastructure (e.g., organizational capacity, partnerships) in adaptation planning investments,** including encour-

aging assessment of soft infrastructure in the application process, eligible funding for soft infrastructure, and greater resource provision for applicants throughout the award period.

- **Adopt a framework for equitable grant monitoring and evaluation** through contracting third-party evaluators and implementing monitoring requirements throughout the grant process.

Recommendations for the State adaptation funding landscape:

- **Sustain ongoing funding for adaptation planning** given continuous high demand: the State's adaptation and resilience grant programs are oversubscribed by an average of 528%.[a]
- **Provide resources to ICARP to provide navigation support for practitioners and applicants** through structural and financial support, formalizing ICARP's existing role as a resource in the adaptation landscape.
- **Align State adaptation funding across State programs and with Federal climate resilience funding** through intentional program design and information sharing, facilitating a whole-of-government approach to adaptation planning.

a See Table 6 in Section V on page 56.

I. INTRODUCTION

ADAPTING TO CLIMATE CHANGE

California is already experiencing the impacts of a changing climate, including wildfire, drought, sea-level rise, extreme heat, and extreme precipitation patterns – all of which are projected to increase under future climate scenarios.[7] Building resilience to climate risks requires adaptation, or **a series of actions intended to anticipate, mitigate, and adjust to the challenges posed by warming conditions.** Climate adaptation is crucial to building equitable resilience and safeguarding the state's economy, environment, and public health.

CLIMATE RISKS	ADAPTATION STRATEGIES
Wildfire	• Land management to reduce fuel loads • Defensible space around buildings and fuel breaks near communities • Clean air shelters and other smoke protections • Enhanced warning and emergency response systems
Drought	• Water conservation and efficiency measures • Diversification of water sources • Drought-tolerant landscaping • Drought-resilient agricultural practices
Sea-Level Rise	• Avoiding development in vulnerable areas • Restoring ecosystems to provide natural buffers against erosion and storm surges
Extreme Heat	• Urban green spaces and tree canopy cover • Cool roof and pavement technologies • Community cooling centers • Heat emergency response plans
Extreme Precipitation	• Stormwater management infrastructure • Green infrastructure solutions • Updating building codes and land use regulations in accordance with increased flood risk

Table 1. Adaptation Strategies for California's Climate Risks.

The costs of climate change are significant, including damage to infrastructure, disruption to industry operations, risks to insurance and financial markets,[8] strain on healthcare systems,[9] and costs associated with reduced labor productivity,[10] among others. For example, California's most recent wildfire seasons resulted in an estimated $9.9 billion in property damage and $1.3 billion in State response costs,[11] and exposed the population statewide to high levels of wildfire-driven air pollution.[12]

Adaptation strategies reduce the costs of climate change by protecting valuable infrastructure and building economic and community resilience to a warming climate.[13] While adaptation requires investment, cost-benefit analyses show that the cost of inaction outweighs the development of adaptation strategies if implemented effectively (see Appendix A).[14]

Due to the costs associated with adaptation efforts, however, many jurisdictions lack the necessary resources, tools, and guidance to adequately prepare for baseline shifts and extreme events. Notably, these communities often face the additional burden of systemic socioeconomic and environmental inequities, reducing their relative adaptive capacity.[15]

Adaptive capacity is the ability to moderate potential damages or take advantage of opportunities arising from climate change.

As the impacts of climate change disproportionately affect vulnerable communities, often with fewer existing resources to develop adaptation plans, investing in adaptation strategies that support adaptive capacity forms an essential equity measure in building climate resilience.

CALIFORNIA'S APPROACH TO CLIMATE ADAPTATION

California state policy supports adaptation efforts through research, planning, educational resources, and targeted funding and investment, detailed in Appendix B.[16] California has assessed the projected impacts of climate change on the state since the 1990s, and since 2005, has produced four comprehensive climate change assessments to understand climate risks and inform policy. Recent assessments have had an increased emphasis on adaptation: the Second Assessment (2009) identified long-term economic savings associated with resilience investments,[17] and the Fourth Assessment (2018) provided technical reports to support adaptation at local, regional, and state levels.[18] The Fifth Assessment, currently underway, will fill existing knowledge gaps by uplifting new research on climate impacts and pathways toward resilience, with a specific focus on equity considerations.[19]

The Legislature and Governor approved several new, large-scale investments in adaptation in the State's 2021-2022 budget (see Appendix C).[20] However, demand for adaptation funding still far outweighs available resources.[b] The State's adaptation grant programs are continuously oversubscribed, and engagement with community representatives has highlighted a significant need for support in all stages of the adaptation process.

b Demand for APGP program funds was nearly eight times the amount of funding made available in Round 1.

THE NEED FOR ADAPTATION PLANNING

California's Climate Adaptation Planning Guide provides a roadmap for local governments to move through the four phases of the adaptation process, beginning with exploration and planning activities and extending through implementation, evaluation, and adaptive management (Figure 1):

Figure 1. The four phases of the adaptation planning process.[21]

Effective and equitable adaptation is contingent upon a proactive planning phase that involves identifying climate risk priorities, assessing adaptation strategies, and engaging interested parties, including community members. Adaptation planning underpins efficient strategy implementation and is often a prerequisite for accessing implementation funding grants. As developing adaptation plans can exceed municipal budgets, under-resourced jurisdictions are at a particular disadvantage in receiving and utilizing funding made available for implementation. As a result, supporting adaptation planning is an essential capacity-building measure in protecting the most vulnerable communities from climate risks.

ICARP'S ADAPTATION PLANNING GRANT PROGRAM

The Adaptation Planning Grant Program (APGP) is one of the new adaptation investment programs established in the 2021-22 State Budget. The Integrated Climate Adaptation and Resiliency Program (ICARP) in the Governor's Office of Planning and Research (OPR) administers APGP, which provides funding for adaptation planning and furthers ICARP's statutory directive to advance equitable, integrated climate adaptation and resilience solutions.

Integrated climate adaptation and resilience solutions refer to actions that both reduce greenhouse gas emissions (mitigation) and build resilience to climate impacts (adaptation).

ICARP staff designed the program to support equitable decision-making and address vulnerable communities' specific needs, strengths, and assets. In doing so, APGP addresses the capacity gap in community resilience to multiple climate hazards, supporting communities lacking the capacity, tools, guidance,

and resources to effectively prepare for the impacts of climate change. In June 2023, OPR announced $8 million in project awards through APGP's first round of funding, supporting 14 diverse projects to enhance local resilience to climate impacts.

AN EQUITY-DRIVEN ASSESSMENT

This report provides an assessment of the Adaptation Planning Grant Program and places it in the context of the State's adaptation funding landscape. Specifically, this analysis:

- Examines the need for integrated, equitable adaptation planning in California;
- Provides an initial assessment of APGP's role in this context, including an assessment of Round 1 solicitation and awards and updates made in Round 2; and
- Presents recommendations for the improvement of APGP and for the State to advance an integrated and equitable adaptation funding landscape.

The analysis is grounded in a review of recent literature on adaptation planning; data provided by APGP applicants, grantees, and ICARP; interviews with 14 program grantees; and four case studies on awarded projects, illustrating the range of adaptation strategies supported by APGP. The report is intended to facilitate further research and policy development in innovative, equity-oriented solutions to adaptation funding, supporting California's communities in building lasting climate resilience.

Jason - stock.adobe.com

II. INTEGRATED AND EQUITABLE ADAPTATION PLANNING

Multiple factors contribute to an increased urgency for adaptation planning, including more visible climate impacts, associated financial stress, and increased funding availability for adaptation activities. Over the last decade, many communities have begun more active adaptation planning[22] in recognition that the economic and social cost of climate change to public and private sectors will increase in the coming years.[23] However, adaptation without integrated, equity-oriented planning can lead to maladaptation, increases in future costs, and significant gaps in adaptive capacity between communities.

Integrated, equity-oriented adaptation planning incorporates two key planning principles to help avoid maladaptation:

- **Integrated planning** emphasizes both mitigation and adaptation strategies for building resilience while aligning adaptation planning with other concurrent planning processes.
- **Equity-oriented planning** acknowledges and seeks to address the disparities in how communities experience both the benefits and burdens of climate change.[25]

Centering equity in the adaptation planning process while aligning adaptation with other plans can ensure efficient and fair distribution of resources, help address past and ongoing climate disparities, and effectively build capacity in vulnerable communities.[26]

Climate vulnerability describes the degree to which natural, built, and human systems are at risk of exposure to climate change impacts. **Vulnerable communities** experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/ or economic factor(s), which are exacerbated by climate impacts. These factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality.[27]

Maladaptation occurs when an action intended to facilitate adaptation instead increases exposure and sensitivity to climate change impacts. When maladaptation occurs, communities become even more likely to be negatively affected by climate change.[24]

DISPARITIES IN ADAPTIVE CAPACITY NECESSITATE EQUITY-ORIENTED APPROACHES

Climate change disproportionately affects California's most under-resourced and underrepresented communities, including low-income communities, communities of color, and Tribal communities. Due in large part to historical and ongoing disinvestment, these groups face heightened climate risk and have less capacity to cope with, adapt to, and recover from impacts; they are also the most likely to experience the negative consequences of maladaptation.

Reduced adaptive capacity in California's vulnerable communities results from institutional practices and structural systems that increase sensitivity and exposure to climate risks.[28] California has facilitated a long history of disenfranchisement through institutional racism and classism, redlining policies and disinvestment, and the exclusion of low-income people and people of color from education, healthcare, and political systems.[29] The State has also supported a series of maladaptive strategies, such as coastal armoring,[30] that protect some communities from climate hazards at the expense of further exposing others.[31] Together with practices that place sources of pollution near frontline communities[32] and exacerbate poor public health outcomes,[33] these actions have resulted in significant differences in adaptive capacity between communities across the State.[34]

Equity-oriented approaches to adaptation planning are critical to correct historical injustices.[35] Given disparities in adaptive capacity and climate vulnerability, planning processes that center equity are necessary to build resilience in communities that have experienced disenfranchisement. Not only should equity-oriented approaches enable climate adaptation, but they should also create opportunities for healthier, safer, and more profitable communities with enhanced access to the benefits of natural and built environments.

BOX 1. RESOURCES ON EQUITY-ORIENTED ADAPTATION PLANNING

In recent years, equity and environmental justice organizations have developed resource guides and reports highlighting the need for and effectiveness of equity-oriented adaptation planning. The following are select resources on equity-oriented adaptation and climate resilience planning.

1. Guide to Equitable, Community-Driven Climate Preparedness Planning

   Raimi + Associates for the Urban Sustainability Directors Network | 2017

   The purpose of the Guide to Equitable, Community-Driven Climate Preparedness Planning is to provide guidance to local governments in designing and implementing a more inclusive, equitable planning process.

2. Community-Driven Climate Resilience Planning: A Framework

   Movement Strategy Center | 2017

   The Framework, developed by community-based organizations from across the country, aims to strengthen City Planning and Climate Adaptation through culturally relevant, democratic processes that meaningfully engage vulnerable and impacted communities in defining and building climate resilience.

3. Making Equity Real in Climate Adaptation and Community Resilience Policies and Programs: A Guidebook

   The Greenlining Institute | 2019

   The Guidebook offers policymakers a blueprint for operationalizing equity in policies and grant programs, with the goal of centering community needs and building social equity.

4. Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide

   Antioch Center for Climate Preparedness and Community Resilience | 2022

   The Practitioner's Guide introduces and amplifies principles and best practices for centering equity in climate resilience planning and action, intended primarily for users of the U.S. Climate Resilience Toolkit and its Steps to Resilience.

ELEVATING PLAN ALIGNMENT IN EQUITY-ORIENTED ADAPTATION PLANNING

Plan alignment leverages connections, information, and resources to build shared language, data foundations, and processes across multiple planning efforts at any scale.[36] Plan alignment is one of the most effective strategies to accelerate the development and implementation of effective resilience plans and processes; alignment and integration provide efficiencies for funding and staff time while ensuring that plans complement each other. The resulting plans are inclusive, holistic, and actionable.

Plan alignment is particularly important in the context of climate change. Climate impacts are cross-sectoral and cross-jurisdictional and frequently require action at multiple scales. Unaligned planning risks resulting in maladaptation, furthering inequities in community adaptive capacity and resilience.

Integrated, equity-oriented adaptation planning should align with and be included in other local and State planning processes, such as hazard mitigation plans, general plan updates, emergency plans, etc.[37] These planning processes are expensive to undertake, and without aligned planning that incorporates climate change impacts and adaptation strategies, these plans are also less effective. Plan alignment can enable lower-resourced jurisdictions to access immense cost savings if planning funding provides them with the flexibility to integrate or align adaptation plans with other ongoing planning processes.

To support communities in elevating plan alignment, ICARP released the Climate Resilience Plan Alignment Toolkit in December 2022.[38] The Toolkit includes a suite of resources and guides to assist planners and practitioners in designing equitable, aligned climate adaptation and resilience plans.

THE BENEFITS OF INVESTING IN EQUITABLE PLANNING PROCESSES

Investments in equitable adaptation planning are likely to support long-term positive economic outcomes because planning processes tend to be less expensive than implementation[39] and offer opportunities for cost savings. Effective planning–especially that which incorporates proactive and meaningful community outreach and engagement–can help ensure that implementation processes run smoothly in the future. Well-designed equitable planning processes do this by helping to identify potential obstacles for implementation, considering alternate solutions scenarios, and centering the needs and decision-making of communities that will ultimately benefit from or be impacted by the adaptation action.

This also means that equitable planning can help cut implementation costs by anticipating challenges and avoiding maladaptation. These steps ensure that the proposed solution has the highest cost-benefit, delineating between shovel-ready and shovel-worthy projects (see Box 2) and providing practitioners access to funding sources that may not have been available otherwise. Other positive outcomes of equity-oriented adaptation planning include creating opportunity for community participation, resilient design, fiscal and regulatory responsibility, and advancing just outcomes.[40]

BOX 2. THE SHIFT TOWARDS SHOVEL-WORTHY PROJECTS

'Shovel-ready projects' are projects that have undergone the necessary planning and permitting requirements and are immediately ready for implementation. Funding programs often prioritize shovel-ready projects because they can provide near-term results. However, this focus often places communities with lower capacity and resources at a disadvantage because they are less likely to have completed necessary planning and permitting activities for a given project. In addition, shovel-ready projects may not be responsive to emergent climate impacts and changing climate conditions. Alternatively, 'shovel-worthy projects' are those that may have high initial costs but present an opportunity for long-term, multi-benefit, equitable outcomes that support resilient and sustainable communities.[41] There is a growing recognition that only prioritizing shovel-ready projects does not capture the same benefits as shovel-worthy projects and that, to maximize equity, practitioners should evaluate funding priority based on worthiness in addition to readiness.[42]

INADEQUATE FUNDING DEEPENS INEQUITY

Despite the known costs of a business-as-usual approach and the proven benefit of adaptation investments–particularly in planning–funding availability remains a major barrier to adaptation.[43]

Funding barriers deepen the inequities in community preparedness for climate change. The cost of plan development often exceeds municipal budgets,[44] and integrating critical equity-enhancing measures, like partnerships with community organizations and compensation for public participation, can increase short-term costs. Practitioners regularly highlight the lack of accessible and sustained funding for hiring staff, partnering with consultants, developing plans, and implementing projects as a top barrier to pursuing adaptation.[45] Lower-resourced jurisdictions with limited access to general funds are at a particular disadvantage in moving through the adaptation process. These jurisdictions may have a harder time breaking through the barrier to entry (i.e., initiating adaptation planning), further increasing the gap in adaptive capacity and climate preparedness between higher-resourced and lower-resourced communities.

While the State does operate a suite of climate adaptation and resilience grant programs, funding for planning, specifically, is sporadic and inadequate to meet the demonstrated need. Existing programs, though seeing progress, also struggle to make funds flexible and accessible, perpetuating grant cycles that reward and re-fund the most resourced and experienced communities. Programs that provide flexible, accessible funds and prioritize investments in vulnerable communities are the most likely to see equitable resilience and capacity-building outcomes. ICARP's Adaptation Planning Grant Program (APGP) has an opportunity to serve as a model for elevating equity-oriented adaptation planning through State funding.

III. THE ADAPTATION PLANNING GRANT PROGRAM

The California Budget Act of 2021 established the Adaptation Planning Grant Program (APGP) in 2021. APGP provides funding for climate adaptation and resilience measures.

This assessment of APGP focuses on program activities and outcomes in the first round of the program. As of the drafting of this report, the second round has just gotten underway. The following sections provide an overview of Round 1 design and funding, engagement activities and outcomes, and awarded projects. The section concludes with a description of program adjustments made in Round 2 based on feedback and experience in Round 1.

OVERVIEW OF ROUND 1 OF APGP

Staff began engagement opportunities to inform the first round of APGP (FY 2022-2023) in March 2022. Staff released the Round 1 Final Program Guidelines, notice of funding availability (NOFA), and Application Materials on January 6, 2023, and ICARP announced award decisions in June 2023. A full timeline of the Round 1 development and engagement process is below:

DATE	MILESTONE OR ACTIVITY
September 2021	SB 170 established APGP
March-April 2022	APGP Listening Sessions • 7 Listening Sessions, attended by 583 Participants
June 22, 2022	APGP Engagement Summary Released

DATE	MILESTONE OR ACTIVITY
September 2022	Public Comment Period for Draft Round 1 Guidelines Begins
September 30, October 7, 13, & 22, 2022	Round 1 Draft Guidelines Workshops • 4 Workshops, attended by 354 Participants
November 7, 2022	Round 1 Intent-to-Apply Survey Launched • 141 Responses
January 6, 2023	NOFA Released and Application Launched
January 10 - March 8, 2023	Round 1 Application Workshops and Office Hours • 3 Workshops, attended by 300+ Participants • 10 Office Hour Sessions, ranging from 0-10+ Attendees each
March 31, 2023	Final Round 1 Applications Due • 108 Applications screened by APGP Staff • 69 Applications advanced to Interagency Review
June 1, 2023	Round 1 Awards Announced • 14 Grantees

Table 2. Timeline of APGP Round 1 Activities.

Round 1 provided $8,000,000 of funding, with individual grant availability ranging from $150,000 to $650,000 for planning projects spanning 30 months. In recognition of disproportionate climate impacts on vulnerable and under-resourced communities, APGP specifically intended to allocate a portion of funding to California Native American Tribes and priority communities eligible for FEMA Hazard Mitigation Assistance (HMA) funding (see the Round 1 Program Guidelines).

Round 1 APGP Priorities[46]

1. Explicitly and meaningfully prioritize equitable outcomes;
2. Encourage communities to equitably plan for and respond to multiple climate risks;
3. Support integrated social and physical infrastructure planning;
4. Build statewide capacity to plan for and implement equitable planning strategies; and
5. Embed equity into the planning process, from project visioning through project evaluation.

Applicant eligibility and requirements are outlined below and detailed in the Round 1 Program Guidelines.

Eligible applicants for APGP Round 1:

- Local public entities
- California Native American Tribes
- Community-based organizations (CBOs)
- Non-profits

Eligible activities for APGP Round 1 fit into one or more of the adaptation planning phases:

- Phase 1: Explore, Define, and Initiate
- Phase 2: Assess Vulnerability
- Phase 3: Define Adaptation Framework and Strategies
- Phase 4: Implement, Monitor, Evaluate, and Adjust

ASSESSMENT OF ROUND 1 OF APGP

The assessment of the first round of APGP draws on program data provided by APGP staff and interviews conducted by CLEE with Round 1 Grantees. These data include information gathered from all program engagement activities, as described below, and help identify trends in program engagement, application, and award—including variation in activity by region, organization type, and other variables. Through analysis of these data, this assessment examines overall program activity and how the program performs relative to the Round 1 Program Priorities and funding target goals.

Program Engagement

Throughout the program lifecycle, APGP engaged over 1,100 individuals, representing 583 organizations, in different engagement activities. These activities include listening sessions, guidelines workshops, intent-to-apply surveys, office hours, and application workshops.

The number of engaged organizations varied by region (see Figure 2). However, regional patterns generally mirror population, such that the more populous regions represent a larger share of engaged organizations; this likely accounts for most, but not all, variation in engagement.

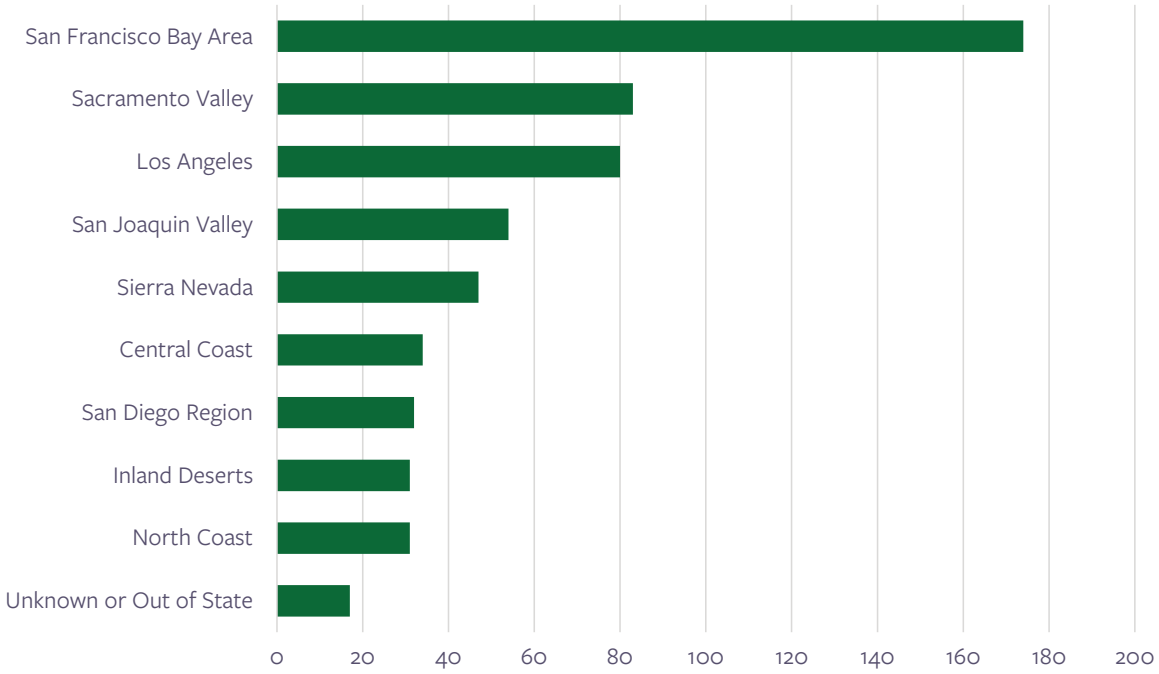


Figure 2. Number of organizations that engaged with APGP by region.

Local government entities, including counties, cities, towns, and special districts (see Figure 3), comprised the largest share of engaged organizations. Few engaged organizations identified as regional collaboratives, foundations, or utilities. In addition to the 28 Tribal Governments, another eight organizations self-identified as representing tribal interests.

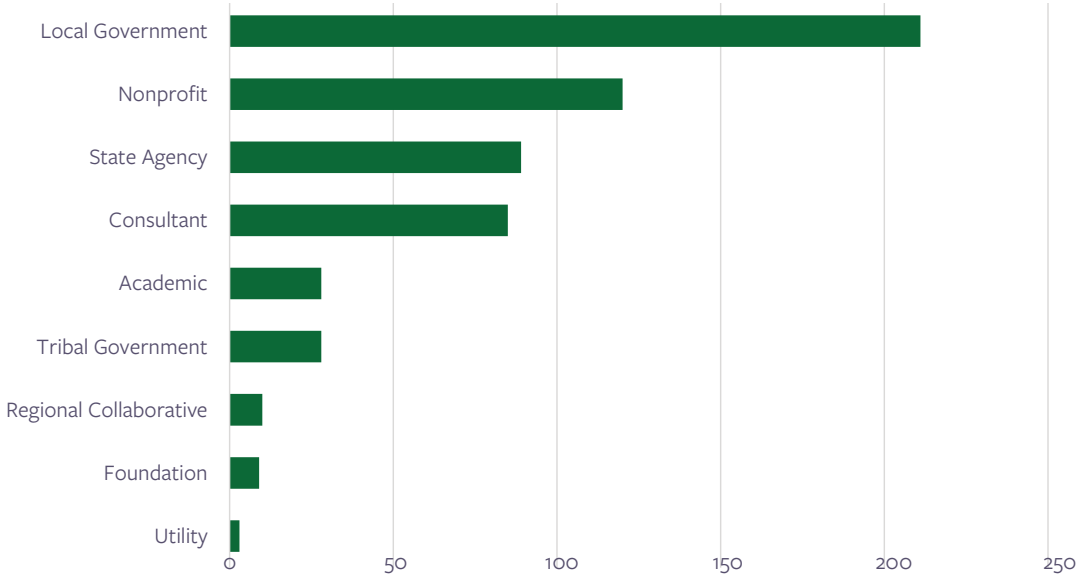


Figure 3. Number of organizations that engaged with APGP by organization type.

The seven listening sessions APGP staff hosted to launch the program had the highest level of engagement across all APGP engagement activities. Draft guidelines and application workshops were also heavily attended (see Figure 4).

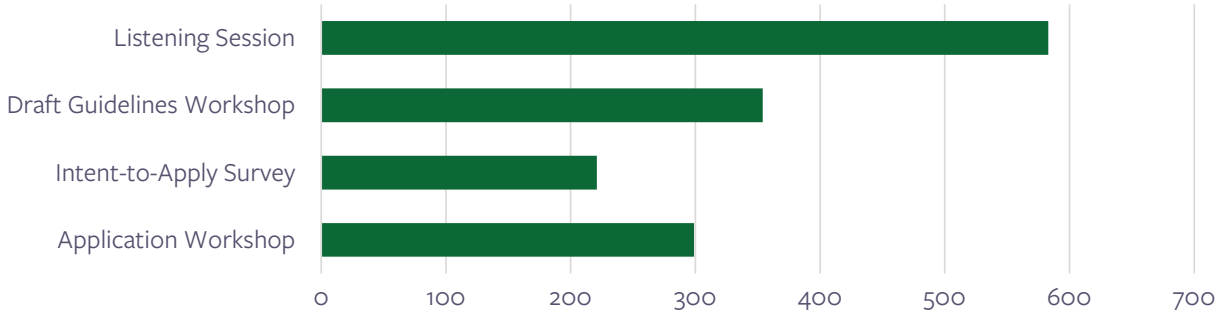


Figure 4. Number of participants in each APGP engagement activity.

Nearly 600 individuals participated in the listening sessions; attendance was highest at the San Francisco Bay Area session, followed by the Los Angeles regional session and then the Sacramento Valley, San Diego, and San Joaquin Valley regional combined session (see Figure 5).

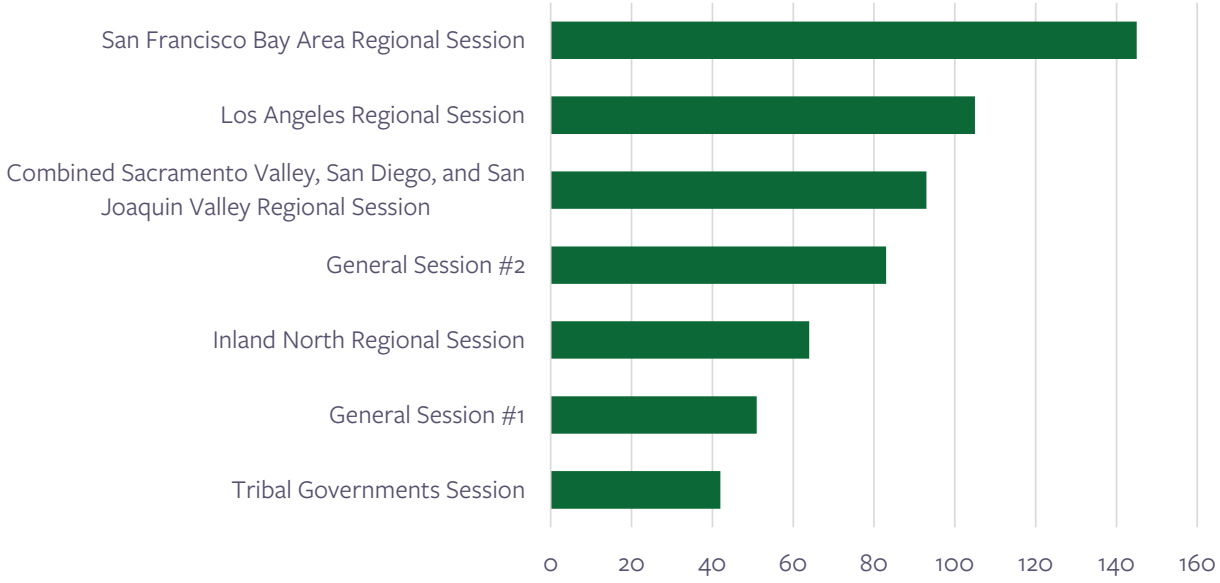


Figure 5. Number of attendees to each APGP Listening Session.

Applications and Requested Funds

APGP received 141 intent-to-apply surveys from prospective applicants in Round 1, requesting a total of $63,000,000 in funding - nearly eight times the amount of funding available. Prospective applicants who submitted the intent-to-apply survey

represent each California Climate Adaptation Strategy region[c] and 60% of the State's counties (see Figure 6).

108 entities submitted complete applications. Of those, 69 applications met all program requirements (see Figure 7) and were passed on to the interagency review panel, which consists of 12 state agencies. The 69 applications totaled $33,039,716 in requested funds.

APPLICATION STAGE	NUMBER OF RESPONSES	TOTAL FUNDS REQUESTED
Submitted an Intent-to-Apply Survey Response	141	$63,000,000
Submitted a Complete Application	108	$48,295,187
Screened and passed on for Interagency Review	69	$33,039,716

Table 3. Summary of Engagement and Funds Requested at Each Application Stage.

The intent-to-apply survey responses that advanced through each application stage tended to be those that aligned clearly with APGP's program priorities (e.g., integrated planning, plan alignment, capacity building) and included a preliminary cost estimate that was within the budget made available through Round 1. Other notable features of proposals that advanced through the application stages included a clear correlation with one or multiple climate adaptation planning stages, intent to address multiple climate or environmental risks (i.e., multi-benefit), and anticipated project deliverables that could serve as a model for others interested in undertaking similar planning processes.

c California's Climate Adaptation Strategy divides the State into nine regions: North Coast, Sierra Nevada, Sacramento Valley, San Francisco Bay Area, Central Coast, San Joaquin Valley, Los Angeles, Inland Deserts, and San Diego.

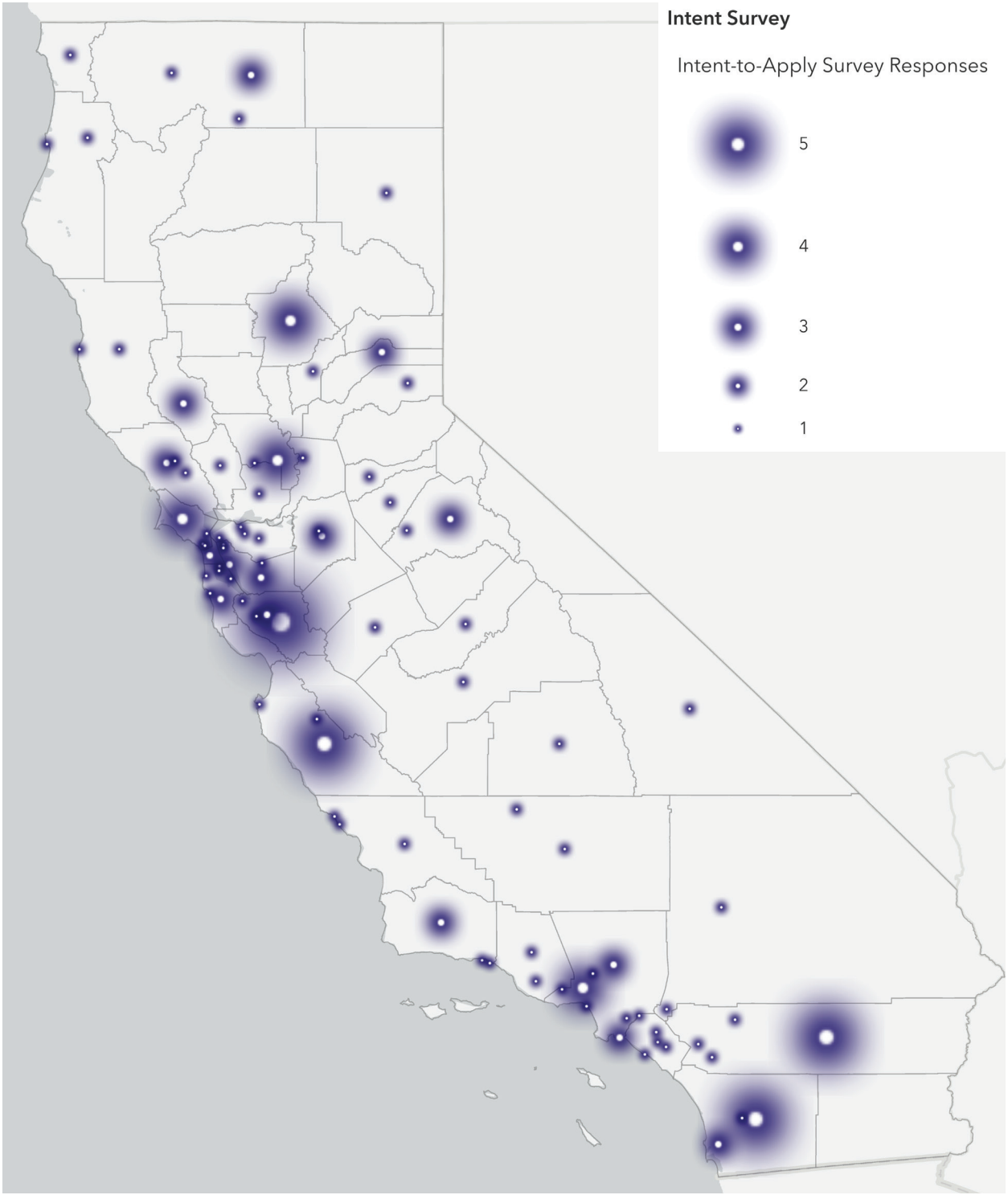


Figure 6. Map of Intent-to-Apply survey responses by jurisdiction.

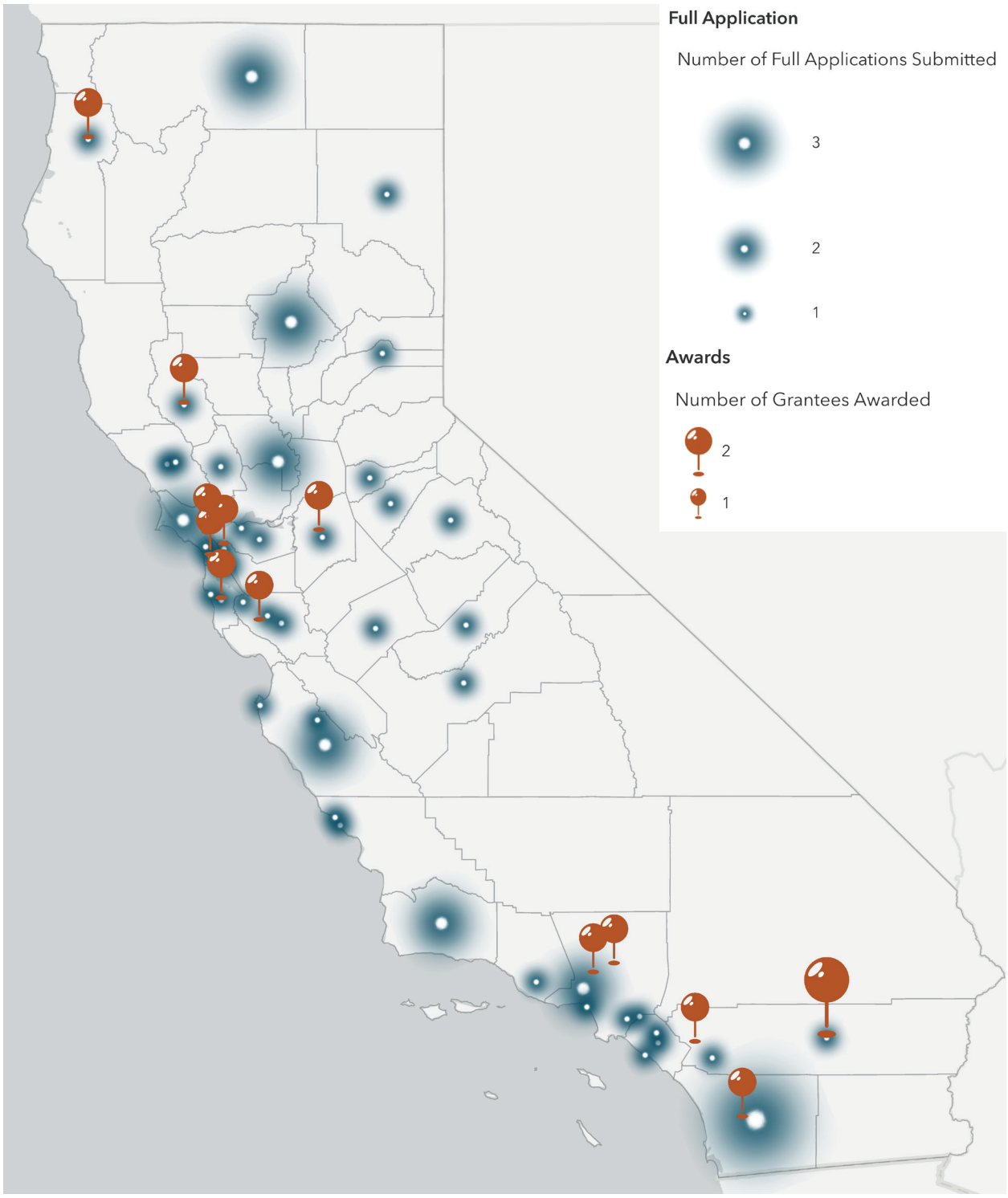


Figure 7. Map of completed applications and awarded projects by jurisdiction.

Program Awards

Through the first round of APGP, OPR awarded $8 million to 14 planning projects.[47] These projects, summarized in Table 4, include a diverse array of lead applicants and partners–nine NGOs, eight cities, seven counties, six CBOs, four special districts, three California Native American tribes, two universities, one joint powers authority (JPA), one council of governments (COG), and one metropolitan planning organization (MPO). Notably, 64% (nine) of the awarded projects are situated in Justice40 communities, and 20% (three) are led or co-led by California Native American tribes. These coalitions highlight a collective commitment to developing projects that yield multiple climate and community benefits and are rooted in diverse partnerships.

"APGP has shattered silos in climate adaptation efforts, facilitating diverse project partners to unite. Funding for an integrated plan might not have been conceivable otherwise."

APGP Round 1 Grantee

A review of awarded projects and interviews with each project lead confirm that projects employ data-driven methodologies and continuous evaluation to support effective and science-based adaptation measures. Grantees highlight that the collaborative efforts of organizations, government bodies, and community groups are instrumental in driving progress, while initiatives focused on education and awareness serve to empower local communities.

"APGP provided us with the ability to develop what we're hoping will be a replicable model for the planning process that prioritizes the needs of vulnerable, historically disadvantaged communities."

APGP Round 1 Grantee

PROJECT	LEAD APPLICANT	AWARD AMOUNT
Yosemite Slough Adaptation Plan	City and County of San Francisco	$649,000
Building community capacity, developing equitable adaptation strategies, and positioning Yosemite Slough for federal funding via a plan that addresses disparities in existing adaptation planning.		
San Mateo County OneWatershed Climate Resilience Framework	San Mateo County	$649,648
Developing a model for community-led risk identification, a replicable watershed approach, resilient neighborhoods and watersheds, and breaking down silos in water-related infrastructure planning to address climate adaptation challenges holistically.		
City of Berkeley Safety Element and Environmental Element Update	City of Berkeley	$497,042

PROJECT	LEAD APPLICANT	AWARD AMOUNT
Updating Berkeley's General Plan Safety Element, developing a new General Plan Environmental Justice Element, and creating metrics that incorporate equitable outcomes to monitor and evaluate progress towards meeting the City's climate and resilience goals.		
San José Interdependent Water, Energy, Security & Electrified Transportation	City of San Jose	$649,970
Developing a comprehensive climate adaptation plan that focuses on critical infrastructure and incorporates the needs of vulnerable communities.		
San Rafael Climate Adaptation Planning Collaborative	City of San Rafael	$644,200
Working with disproportionately vulnerable communities in partnership with local organizations in the Canal neighborhood to co-create solutions for improved safety and resilience.		
Shade Equity Masterplan	Kounkuey	$644,411
Developing shade strategies in predominantly low-income, Spanish-speaking areas experiencing extreme temperatures to serve as a blueprint for investing in shade infrastructure, adapting to extreme heat, and ensuring benefits to residents, agencies, and interested parties.		
City of San Fernando Climate Action and Resilience Plan	Climate Resolve & City of San Fernando	$599,918
Developing a Climate Action and Resilience Plan and updating elements in the City's General Plan (land use, circulation, open space, and conservation), which are crucial for effective resiliency planning and alignment with local, regional, and state initiatives.		
WRCOG Energy Resilience Plan 2.0 Microgrid Feasibility Studies	Western Riverside Council of Governments (WRCOG)	$421,000
Identifying up to ten sites across Western Riverside County to conduct feasibility studies to determine the potential to implement microgrids and community resilience centers.		
Lake Elsinore Climate Adaptation Plan	City of Lake Elsinore	$401,100
Assessing climate change impacts and the adaptive capacity of residents, especially Lake Elsinore's most vulnerable community members, and developing strategies to respond to specific impacts.		
LA's Cool Capital Stack	Los Angeles County	$506,000
Creating a pipeline of viable community-led climate-resilient infrastructure projects to strengthen LA County communities most vulnerable to extreme heat and other hazards.		
Hoopa Valley Tribe Climate Adaptation Plan	Hoopa Valley Tribe	$338,448

PROJECT	LEAD APPLICANT	AWARD AMOUNT
Completing climate adaptation scoping activities, a Vulnerability Assessment, and developing a Climate Adaptation Plan in partnership with the community and tribal staff.		
Planning for an Equitable, Climate-Safe Lake	Lake County	$649,350
Creating an inclusive and collaborative framework for improving climate adaptation planning and implementing risk reduction projects in Lake County.		
Ramona Barona Climate Adaptation and Action Plan	Ramona Municipal Water District	$596,600
Developing a comprehensive climate adaptation and action plan to address climate impacts in the area, including extreme heat, water shortages, landslides, flooding, and wildfires.		
Stockton Climate Action and Adaptation Plan	City of Stockton	$650,000
Developing a new Climate Action and Adaptation Plan that focuses on public health and equity, guiding strategies to address the impacts of climate change, particularly for disadvantaged communities in Stockton.		

Table 4. Summary of Awarded Projects.

Spring 2024 Project Status

To understand the current status of awarded projects, the research team interviewed each grantee team. As of March 1, 2024, all grantees had executed contracts and were in the process of holding kick-off events to lay the groundwork for their respective projects.[d] Several participants had initiated community engagement activities and were in the process of developing collaborative processes and partnerships, marking the early stages of their adaptation planning efforts. Below are some of the activities that grantees have undertaken since receiving the grant:[48]

- Organized public kickoffs to introduce the project to residents and organizations.
- Conducted workshops with CBOs and academic institutions to involve residents and students in the adaptation planning process, understand their priorities, and explain the climate impacts affecting their communities.
- Developed guiding documents outlining the areas of focus for adaptation plans, targeted climate impacts, and strategies for analyzing community engagement metrics.
- Established partnerships and set up regular team meetings to lay out comprehensive plans for the adaptation projects, community outreach, and education plans.

d All interviews with grantees were completed in February of 2024. Grantees may have made additional progress on grant activities between the time of the interviews and the publishing of this report in June 2024.

Measuring Project Progress

Many grantees are currently in the planning stages and have yet to finalize their outcome metrics. However, some have outlined plans to measure project progress over time, including through regular meetings and assessing the extent of community engagement. Key strategies for establishing these metrics include conducting engagement workshops with interested parties beyond project management teams, with attendance at these workshops serving as a crucial measure of impact. Additionally, grantees are collecting feedback from both community members and government agency contacts, with project partners receiving weekly input from community leaders. Continued support from government agencies will also be essential in gauging impact. Furthermore, some projects intend to develop policy recommendations or project blueprints in later stages to serve as models for other agencies and organizations. Others are exploring mechanisms for sustained feedback from community members to maintain long-term engagement.[49]

Round 1 Summary

Round 1 saw substantial engagement and high demand for funding, with over 500 organizations engaging with APGP between initial program development through the awarding of Round 1 grantees. Prospective applicants submitted 141 project ideas via the intent-to-apply survey and, in total, requested eight times the amount of available funding. APGP will distribute $8,000,000 to 14 projects in Round 1.

Engagement varied by region. In particular, Round 1 saw low engagement from the Southern San Joaquin Valley and Inland Empire regions. The Central Coast and Sierra Nevada regions had a medium level of engagement during the intent-to-apply and full application stage, but neither saw any applications that were successful in receiving funding. A large number of awarded projects are located in the more populous regions of the State, like the San Francisco Bay Area, the Los Angeles region, and the San Diego region; however, many of these projects do support adaptation planning initiatives led by smaller jurisdictions. Overall, there is a higher level of engagement in the coastal regions of the State as compared to inland regions.

APGP also saw varied engagement by organizations with projects identified as benefitting California's Disadvantaged Communities (DACs) and Justice40 Communities. A review of project descriptions submitted via the intent-to-apply survey found that 45% of proposed projects included a direct reference to benefits for climate-vulnerable, DACs, or Justice40 communities, and 9% of proposed projects included a direct reference to a tribal community.

In total, just about half of intent-to-apply surveys made clear how their project would result in direct benefits to communities most impacted by climate change via an equity lens. Data was insufficient to determine engagement by DAC and Justice40-serving organizations at engagement stages prior to the intent-to-apply survey.

Feedback on APGP Round 1

OPR staff solicited feedback on Round 1 via a survey. Program feedback highlighted that the APGP application process and materials (draft guideline workshops, office hours, application workshops, email correspondence, etc.) were well-designed and easy to navigate.

"They [OPR Staff] are easy to work with and accessible and are really good at understanding where we are as an applicant. When you're competing on a statewide level, you [rural applicants] are always in the background of the urban applicants. But this was a great process to go through."

APGP Round 1 Grantee

However, survey respondents identified a few areas for improvement regarding application narrative and supportive materials.[e] One of the most common pieces of feedback on Round 1 was the need for more targeted, third-party technical assistance, particularly for navigating grant guidelines and pulling together competitive application packages. Another challenge was the reimbursement structure of the program, which can be a particular challenge to under-resourced local governments and community-based organizations.[50] Feedback from Round 1 also highlighted the need for additional guidance on financing strategies for climate adaptation and resilience efforts.

PROGRAM ADJUSTMENTS IN ROUND 2

ICARP released the Round 2 Guidelines and Application Materials in February 2024. These materials reflect several key changes based on Round 1 feedback. Eligible and ineligible applicants and project activities (outlined in the Round 1 Program Guidelines) remained the same between Rounds 1 and 2;[51] however, staff further clarified applicant eligibility and partnership requirements in the Round 2 Program Guidelines.[f]

e For example, staff increased the word count limit on application questions in response to feedback and provided clarity on point deductions for exceeding maximum word count. The choice to deduct points for exceeding the word count is intended to ensure that applicants with more time and staff capacity do not receive an advantage in the application process and review over applicants with less time and staff capacity.

f Round 2 identifies academic institutions as an eligible lead applicant if they partner with at least one local public entity or Tribe and at least one community-based organization.

BOX 3. EARLY INTEREST IN ROUND 2

Staff issued a Notice of Funding Availability, Final Guidelines, and Application Materials for the second round of APGP in February 2024. During Round 2, $9.5 million is available to support local, regional, and tribal adaptation planning projects.

As of April 12th, 2024, APGP has received 60 Pre-Application Interest Forms, requesting $32,125,758 million in funding; this number is likely to increase over time as APGP has extended its Main Application window by two weeks to June 3rd, 2024. Of the 60 Pre-Applications submitted, 29 have requested Technical Assistance. 33 Pre-Applications have a Public Entity as a Lead Applicant; six are from applicants with a California Native American tribe as a Lead Applicant, two are from applicants with a tribe as a Co-Lead Applicant, eight are from Small & Rural Communities, and 27 represent a Disadvantaged Community.

Staff incorporated community feedback into six refined priorities for APGP Round 2 (which can be found in the Round 2 Program Guidelines), an evolution from the five priorities in Round 1. Changes included:

- More directive and action-oriented language throughout
- Stronger and clearer language regarding equity and vulnerability
- Renewed emphasis on enhancing program accessibility and minimizing barriers
- Explicit prioritization of vulnerable communities
- Addition of technical support to help build community capacity for resilience

In Round 2, staff also placed a renewed emphasis on the four 'Core Projects Components' required of all eligible applications: (1) Partnerships, (2) Prioritization of Vulnerable Communities, (3) Plan Alignment, and (4) Integrated Financing Strategies. Together, the Program Priorities and Project Core Components encourage project applications and planning processes that advance integrated, equity-oriented climate adaptation planning. Additional program updates include the following.

Increased Program Accessibility

OPR has taken three important steps to increase program accessibility.

- **Technical Assistance:** OPR has contracted with Civix to offer Technical Assistance to interested Round 2 applicants. The assistance will augment application workshops and office hours, which Round 1 applicants indicated were valuable.
- **New Grant Management Platform:** Moving forward, grant programs administered by OPR and SGC will use a uniform application system called Submittable. This will allow applicants to have a more streamlined experience of the grant application process across different grant programs.
- **Advanced Payment:** In Round 2, APGP is able to provide limited advanced pay for non-profit lead applicants in accordance with Assembly Bill (AB) 590 (Hart, 2023), which establishes a pilot program for advanced payments in certain State grant programs.[g]

Funding for Priority Communities

In Round 2, APGP has taken several steps to ensure funding goes to priority communities. Lead applicants from funding target groups will receive an additional six points during application scoring and be prioritized for third-party technical assistance.[52] In

g AB 590 (Hart, 2023) establishes a pilot program that allows state agencies administering a grant program to provide up to 25% of the total grant awards in advanced payments to grant recipients that are private, nonprofit organizations under Section 501(c)(3) of the Internal Revenue Code and meet specified requirements.

addition, Round 2 of APGP established and expanded funding targets for the following priority communities:[h]

- **California Native American Tribes:** APGP aims to award three or more qualifying projects led by California Native American Tribes, eligible entities having co-ownership with a California Native American Tribe, or eligible entities led by a California Native American Tribe. Round 1 allocated funding to two or more qualifying projects led by tribes or tribal-serving entities. Round 2 guidelines explicitly state that Tribes are not required to show proof of tribal status.
- **California Disadvantaged Communities (DACs):** APGP intends to award four or more qualifying projects directly benefiting disadvantaged communities in Round 2. To meet these criteria, at least 51% of a project area must be in disadvantaged communities using the ICARP Grant Mapping Tool. The ICARP Grant Mapping Tool defines these disadvantaged communities based on specified geographic, socioeconomic, public health, and environmental hazards criteria as outlined in Senate Bill 535 (SB 535), as well as Assembly Bill 1550 (AB 1550), which further defines DACs as low-income communities.
- **Small and Rural Communities:** APGP intends to award three or more qualifying projects to Small and Rural Communities by identifying communities situated 100% outside of contiguous urban areas, with populations fewer than 75,000 and designated as low-income per Assembly Bill (AB) 1550 using the ICARP Grant Mapping Tool. California's Small and Rural Communities often face unique climate adaptation challenges. These communities experience heightened physical isolation from critical infrastructure and services, increased dependence on natural resources, and economic diversification challenges, among others.

ICARP staff developed the ICARP Disadvantaged Communities Grant Mapping Tool, which will provide guidance for applicants on whether they meet the eligibility criteria for two of the three funding targets described above for APGP and other ICARP grant programs with similar targets. The Grant Mapping Tool guides applicants in determining and demonstrating eligibility for DAC or Small and Rural Communities funding. In addition to enhancing APGP's focus on equitable climate adaptation funding, the Grant Mapping Tool further increases accessibility and reduces barriers to applying for prospective applicants for APGP and other ICARP grant programs.

Addressing Gaps in Regional Engagement

In reviewing the regional distribution of engaged organizations, completed applications, and awarded projects, this assessment shows gaps in participation in select regions of the State: the North Coast, Inland North, Southern San Joaquin Valley, and Inland Desert regions (see Figures 6 and 7 in Section III: Applications and Requested Funds).

h Some applicants may identify with multiple funding target groups (e.g., both Small & Rural and DAC). These applicants will be prioritized for funding and Technical Assistance but will not receive any additional points on their application beyond the 6 awarded to funding target groups (i.e., applicants will not receive 6 points per category).

This is a pattern observed in other State grant programs.[53] However, these regions are often identified as priorities for climate funding, given their high population of vulnerable communities (Small and Rural Communities in all three regions, Tribal communities in the North Coast and Inland North in particular,[54] and agricultural workers in the Southern San Joaquin Valley)[55] and exposure to climate impacts (extreme heat in the Inland Desert and Southern San Joaquin Valley, wildfire and flooding in the North Coast and Inland North).[56] APGP staff made several changes between Round 1 and Round 2 to address gaps in regional engagement and funding distribution:

- **Regional Diversity Funding Priority:** In Round 2, APGP aims to fund one project from each of the nine regions identified in the California Climate Adaptation Strategy.
- **Application Workshops:** Program staff will host six application workshops (an additional three from Round 1) to reach more regions of the State.

Integrating Financing Strategies

In Round 2, APGP prioritizes funding for projects that demonstrate strategies for ongoing, long-term financing and/or funding.[57]

Strategies for integrated financing include linking climate planning with State or Federal infrastructure grants or identifying and planning for the use of external resources for adaptation finance. Projects that integrate financing plans are more likely to succeed with the implementation of identified adaptation strategies, ensuring the sustainability of planning projects and creating more opportunities for iterative feedback from community partners. APGP staff amended the Program Guidelines to include additional resources and reference to financing strategies. These changes include:

- A list of resources on funding and financing strategies to support long-term climate adaptation and resilience in Appendix D of the Guidelines
- References to financing strategies in the scoring criteria for the Project Vision & Description and Workplan and Budget components

Integrated financing refers to the practice of strategically linking climate adaptation planning with state or federal infrastructure grants or other longer-term financing solutions to enhance capacity and develop sustainable funding mechanisms that extend beyond initial project phases.

IV. CASE STUDIES: APGP IN ACTION

As part of the APGP Round 1 Assessment, the authors selected four case studies in coordination with APGP staff in order to illustrate the range of project types, lead entity types, regions, and climate risks addressed by APGP funding.

These projects expand on Round 1 interview data to illustrate specific challenges faced by applicant communities and the innovative project types grantees have developed to address these. The case studies also note the essential role of APGP in facilitating not only financial support but also the multisectoral collaboration, partnerships, and capacity building already underway in awarded projects, furthering APGP's progress toward its stated goals outlined in Section III.

The case studies below include a range of integrated climate adaptation plans for urban, rural, and Tribal communities. Notably, all highlighted projects build resilience to multiple climate hazards and incorporate innovative elements of community design and ownership in adaptation planning processes, providing valuable models for equity-oriented adaptation planning in California's communities.

PROJECT LEAD	PROJECT NAME	PROJECT REGION	CLIMATE RISKS	SUMMARY
City of San Francisco	Yosemite Slough Adaptation Plan	Bay Area	Sea Level Rise and Coastal Flooding	Climate adaptation planning for an **urban waterfront region of SF with historically low investment** and high rates of pollution, climate exposure, etc.
Hoopa Valley Tribe	Hoopa Valley Tribe Climate Adaptation Plan	North Coast	Sea Level Rise, Extreme Heat, Pollution	Tribal-led climate adaptation plan **focused on advancing planning efforts to protect/support critical cultural resources**
Ramona Municipal Water District	Ramona Barona Climate Action and Adaptation Plan	San Diego	Wildfire, Flooding, Extreme Weather, Drought	**Partnership between the Ramona Municipal Water District and the Barona Band of Mission Indians** to develop a CAP for an area of land excluded from SD County's CAP process
Los Angeles County	LA's Cool Capital Stack	Los Angeles	Extreme Heat, Flooding, Wildfire, Drought	**Climate resilient infrastructure planning** personalized to a vulnerable community (LA metro), identifying issues already raised in a broader climate vulnerability assessment

Table 5. APGP Round 1 Grantee Case Studies.

CASE STUDY 1: YOSEMITE SLOUGH NEIGHBORHOOD ADAPTATION PLAN

PROJECT LEAD:	City and County of San Francisco (San Francisco Planning Department)
PROJECT CO-APPLICANTS:	En2Action, San Francisco Estuary Institute, BAYCAT, Port of San Francisco
AWARD AMOUNT:	$649,000
CLIMATE RISKS:	Sea Level Rise and Coastal Flooding

The Yosemite Slough Neighborhood Adaptation Plan addresses climate disparities in the Bayview Hunters Point neighborhood of San Francisco.

Project Summary

The Yosemite Slough Neighborhood Adaptation Plan (YSNAP) supports integrated climate adaptation planning to address disparities in climate resilience, environmental justice, and racial & social equity between the Bayview Hunters Point neighborhood and the rest of San Francisco. While a patchwork of projects address sea level rise along the City's urban coastline, gaps remain in adaptation and resilience planning in underinvested communities. These gaps perpetuate disproportionate risks and vulnerabilities to other climate risks, such as stormwater flooding and extreme heat. Bayview Hunters Point, a neighborhood in the City's southeast, faces multiple environmental justice challenges, where ecological hazards, pollution, and social vulnerability disproportionately impact a high concentration of residents. YSNAP aims to develop a climate adaptation plan that enhances the resilience of Bayview Hunters Point while providing a transferable model for community-based adaptation planning in California.

YSNAP will include adaptation strategies to address flood impacts developed through robust technical analysis and a co-created community engagement process. Working with numerous community-based organizations, partners, and other City agencies, YSNAP commits to centering racial and social equity in project outcomes and utilizing nature-based solutions to build climate resilience.

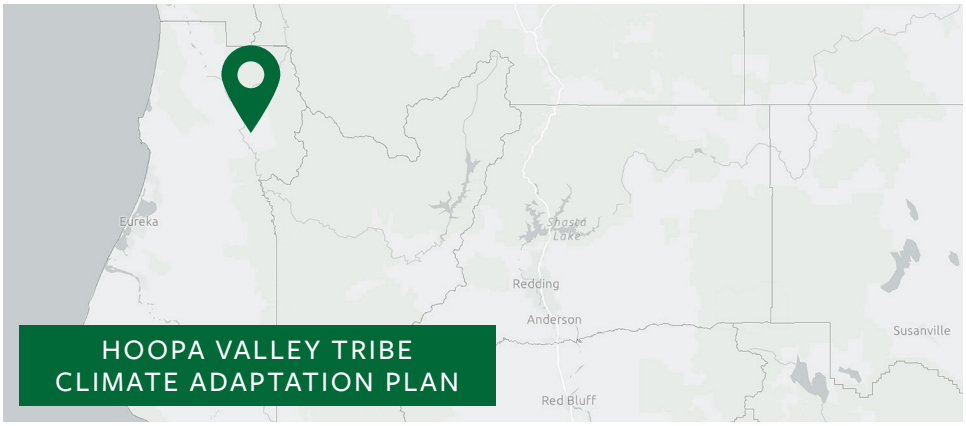
APGP's Role in Funding Adaptation

The City and County of San Francisco has long been aware of the adaptation planning gap that leaves Yosemite Slough and the Bayview Hunters Point neighborhood vulnerable to sea level rise and associated risks. However, the announcement of APGP funding motivated the refinement of the YSNAP concept. All project partners had previously or are currently working with the City and County of San Francisco on climate resilience or other efforts. APGP offered the City and its partners an opportunity to build on existing bodies of work and take advantage of the current alignment between leadership priorities and a higher level of engagement with the project area and demonstrated adaptation needs.

The creation of the plan will enable the City to seek funding for implementation in the future, including federal investment from the U.S. Army Corps of Engineers. This builds on the APGP and California Adaptation Planning Guide's goals to facilitate greater federal investment in disadvantaged communities.[58] The project team is also pursuing supplemental funding to increase capacity for robust community outreach compensation and broaden the technical analysis scope. Nearly half of APGP funds will go directly to community organizations supporting the City in conducting outreach and engagement activities, including compensating community members for their input in the planning process. This community-based adaptation planning model is enabled exclusively by APGP.

CASE STUDY 2: HOOPA VALLEY TRIBE CLIMATE ADAPTATION PLAN

PROJECT LEAD:	Hoopa Valley Tribe
PROJECT PARTNERS:	Hoopa Valley Tribe Planning Department
AWARD AMOUNT:	$338,448
CLIMATE RISKS:	Drought, Heat, Wildfire, Air Quality, Extreme Weather, Flooding and Variable Stream Flows (with impacts on important traditional foods and plant materials)



The Hoopa Valley Tribe Climate Adaptation Plan will support climate adaptation for the Hoopa Valley Reservation and surrounding communities in the Trinity-Klamath region of Northern California.

Project Summary

APGP funding supports the development of the first climate adaptation plan for the Hoopa Valley Tribe, taking a regional perspective on climate impacts on Tribal members as well as other regional interested parties. The Tribe has recently regained ownership of over 10,000 acres of land, forming one of the largest landback efforts in California history and enabling the Tribe to more effectively manage climate adaptation efforts throughout its territory.

The Hoopa Valley Tribe Climate Adaptation Plan will include a vulnerability assessment, the identification of climate stressors, and a synthesized adaptation plan to protect critical cultural resources. Early conversations with Tribal members have already identified key climate areas of interest, including wildfire risk and the impacts of deteriorating water quality on salmon populations. The Climate Adaptation Plan is intended to lead directly to implementation efforts, combining traditional ecological knowledge with long-term strategies for building climate and economic resilience.

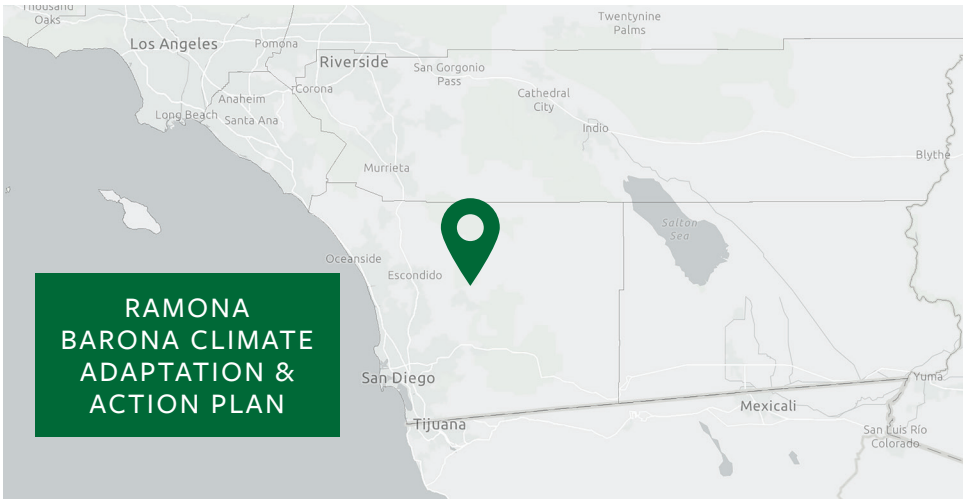
APGP's Role in Funding Adaptation

The Hoopa Valley Tribe relies heavily on funding from State and Federal entities, such as CalFire, FEMA, USDA, and EPA, among Native philanthropic organizations. APGP support is part of a wider State effort to make funding more available to and accessible for Tribal governments. Other State initiatives directing increased funding to Tribal climate work include the 30x30 Initiative, the California Fifth Climate Change Assessment, and the Tribal Capacity Building Pilot Program.

The adaptation plan supported by APGP will play a crucial role in building planning capacity for accessing future implementation funds and presents an opportunity for the Tribe to connect multiple planning efforts, including the Forest Management Plan, the Economic Development Strategy, and the Hazard Mitigation Plan, among others. Funding from APGP will ensure that climate resilience priorities are streamlined throughout wider Tribal planning processes, creating an effective framework for seeking implementation funding through these plans in the future. Project partners intend the Climate Adaptation Plan to become a model for other Tribes, emphasizing the importance of community buy-in and engagement for community members, particularly youth.

CASE STUDY 3: RAMONA BARONA CLIMATE ADAPTATION AND ACTION PLAN

PROJECT LEAD:	Ramona Municipal Water District
PROJECT CO-APPLICANTS:	Barona Band of Mission Indians
PROJECT PARTNERS:	Sustainable Ramona, Ramona Chamber of Commerce, Ramona Valley Vineyard Association, Ramona West End Fire Safe Council
AWARD AMOUNT:	$596,600
CLIMATE RISKS:	Wildfire, Flooding, Extreme Weather, Drought



The Ramona Barona Climate Adaptation and Action Plan will support integrated adaptation planning for communities located in San Diego County in Southern California.

Project Summary

The Ramona Barona Climate Adaptation and Action Plan supports an integrated climate adaptation plan for the unincorporated community of Ramona and the Native American community of Barona. The Climate Action Plan currently underway for the County of San Diego excludes lands under tribal jurisdiction as well as the land and infrastructure operated by the Ramona Municipal Water District. As a result, this project works collaboratively across community partners, sectors, and languages to address this gap and build resilience to multiple climate risks in both communities, including wildfire, flooding, extreme weather, and drought. A diverse group of organizations have partnered to form the Ramona Barona Climate Adaptation and Action Plan, including the Ramona Chamber of Commerce, the Ramona Valley Vineyard Association, and the Ramona West End Fire Safe Council, among others. The Plan will help address the equity gap in climate adaptation faced by rural communities in San Diego County, and especially Native American communities throughout California.

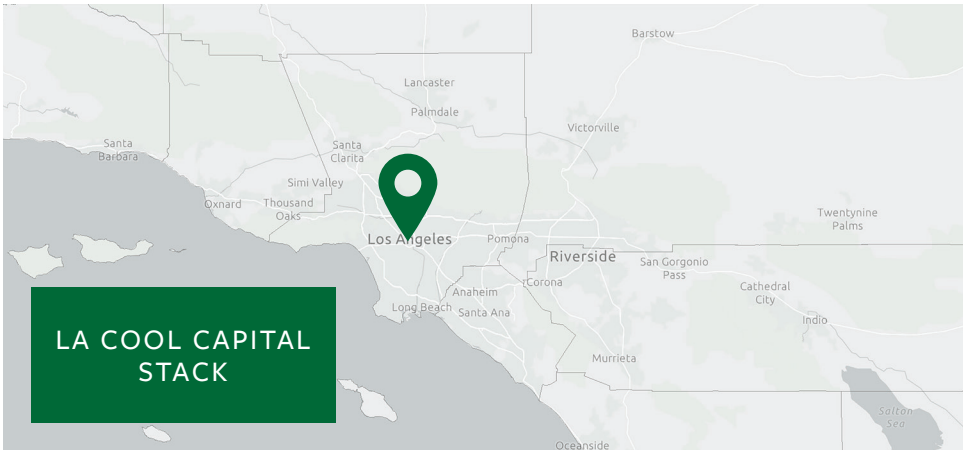
APGP's Role in Funding Adaptation Planning

This project will form the first integrated climate adaptation plan in both communities, as capacity limitations and sectoral silos had previously posed barriers to integrated planning processes. The APGP grant has provided Ramona and Barona the opportunity to instigate a multisectoral partnership while developing a comprehensive adaptation plan protecting both communities from climate risks. Ramona and Barona had already been working together on a shared water system, but this collaboration between the two communities has laid the groundwork for future partnerships in other aspects of climate resilience, as well as in emergency services, agriculture, and recreation, among other sectors.

As a result, the integrated climate adaptation plan has notably addressed silos in climate adaptation. Integrating planning for multiple climate risks will enable project partners to seek future implementation funds in multiple areas. Already, the Climate Adaptation and Action Plan is expected to inform the wider Ramona Community plan, water district plans, wildfire resilience plans, and collaboration with the County of San Diego, among other planning and community processes. Project partners also expect to utilize layered funding to support specific adaptation needs emerging from the integrated planning process.

CASE STUDY 4: LA COOL CAPITAL STACK

PROJECT LEAD:	Los Angeles County
PROJECT CO-APPLICANTS:	LA Metro, LA Waterkeeper and Infrastructure Justice Los Angeles (IJLA)
AWARD AMOUNT:	$556,000
CLIMATE RISKS:	Extreme Heat, Flooding, Wildfire, and Drought



The LA Cool Capital Stack project will support adaptation planning and capacity building efforts in Los Angeles County in Southern California.

Project Summary

The LA Cool Capital Stack project will create an agency-community collaborative to address priority issues identified in Los Angeles County's 2021 Climate Vulnerability Assessment (CVA). The CVA highlighted climate risks, such as the growing impacts of extreme heat on populations such as unhoused individuals and outdoor workers. However, the CVA's scope did not include recommendations for resilience interventions. This project engages community-based partners to envision and design infrastructure interventions to build resilience among LA County communities most vulnerable to extreme heat and other climate risks such as flooding, wildfire, and drought.

APGP's Role in Funding Adaptation Planning

LA Cool Capital Stack bridges a historical gap between community priorities and available funding for the implementation of climate adaptation infrastructure. The LA County Chief Sustainability Office wanted to undertake this project concept for years but faced barriers due to a lack of funding resources and its interdisciplinary, innovative nature. The grant opportunity provided by APGP catalyzed the development of LA Cool Capital Stack through the program's support for multi-benefit, community-led climate adaptation planning. Los Angeles County and the Infrastructure Justice for LA Coalition had already been working together on resilience initiatives, but APGP formalized this partnership and provided a structure for intersectoral collaboration and community capacity-building.

The work plan relies on existing County planning resources, such as the Green Streets Master Plan, the Vision Zero Master Plan, the Park Needs Assessment and Park Needs Assessment Plus, and the draft Community Forest Management Plan, examining these resources with an extreme heat and climate resilience lens. The plan will also align with existing County plans and reports, including the OurCounty Sustainability Plan, the County General Plan Safety Element, the LA County Climate Change Health Equity Report, and the 2045 draft LA County Climate Action Plan. Projects resulting from the collaborative will be planned to maximize multiple related community and climate resilience benefits and lead directly to implementation planning. In doing so, they will exemplify the "capital stack" concept, simultaneously accelerating multiple foundations of long-term community resilience. Project partners envision this collaborative and multi-benefit framework as a model for long-term, community-led adaptation planning.

SUMMARY OF CASE STUDIES

While these case studies highlight diverse approaches to and applications of APGP grant funding, they also illustrate multiple key themes regarding APGP's role in California's adaptation planning landscape. Themes present across all case studies include the following:

- Building political and community support for adaptation planning and implementation;
- Addressing multiple climate risks through integrated planning processes;
- Incorporating innovative and actionable equity measures in planning processes;
- Filling longstanding funding gaps in priority communities;
- Accelerating and resourcing innovative collaborations and partnerships; and
- Supporting plan alignment with other climate action planning processes and future implementation efforts.

Some case studies provide especially notable models for future adaptation planning in one or more of the areas outlined above.

The Yosemite Slough Neighborhood Adaptation Plan and LA's Cool Capital Stack include particularly advanced equity measures in project design and development, enabling high levels of community ownership over the planning process and resulting implementation efforts. YSNAP's commitment to centering racial and social equity in project outcomes informs both the project's technical analysis and its community engagement process. The structure of YSNAP's community engagement process also facilitates co-creation, relying on leadership from numerous community-based organizations in project development. The LA Cool Capital Stack has alternatively created a collaborative overseeing the grant's implementation, comprised of Infrastructure Justice LA and the LA County Chief Sustainability Office. This project process is also notably community-led, working across multiple community partners to center the priorities of marginalized populations, including unhoused individuals and outdoor workers, in the adaptation planning process.

The Hoopa Valley Tribe and Ramona Barona Climate Adaptation Plans demonstrate the wide-ranging and long-term impact of funding Tribal climate adaptation planning. APGP has supported the first climate adaptation plan for the Hoopa Valley Tribe, which will identify and build resilience to climate stressors not only for Tribal members but for the region more broadly. By combining traditional ecological knowledge with strategies for long-term economic resilience, the resulting plan will form an influential model for other Tribes while feeding directly into future implementation efforts. APGP funding for the Ramona Barona Integrated Climate Action and Adaptation Plan also removed numerous barriers to adaptation processes in both the Ramona and Barona communities, including ongoing capacity limitations for the Barona Tribe and sectoral silos. The resulting plan will address the capacity gap faced by rural communities in San Diego County and support the prioritization of Tribal knowledge in this and wider San Diego adaptation processes through links to future implementation.

LA Cool Capital Stack and the Ramona Barona Climate Action and Adaptation Plan demonstrate the particularly innovative partnership models resourced and accelerated by APGP funding. The LA Cool Capital Stack project's creation of an agency-community collaborative enables a coalition of community-based organizations and city partners to formally collaborate across sectors and entity types. While project partners had worked together previously, Los Angeles County had been unable to access funding sources, allowing formal co-creation of project goals. The Ramona Barona Climate Action and Adaptation Plan similarly formalized and accelerated existing collaboration between a Tribal and an unincorporated community on climate adaptation. Interviewees expressed that the APGP grant has laid the groundwork for cross-community collaboration not only on climate resilience but in a variety of sectors, including emergency services, agriculture, and recreation.

"We're going to create it [the climate adaptation plan] so that it's a living document and actionable, not just one of these documents that sits on the shelf. As you know, climate change is real, and impacts are changing quickly. So we're developing our plan to be adaptive and easily changeable."

APGP Round 1 Grantee

V. LOOKING AHEAD: RECOMMENDATIONS

ICARP plays an important role in supporting local and regional climate adaptation efforts and is well-positioned to develop collaborative, community-oriented funding programs that address California's key adaptation challenges.

Through APGP and related grant programs, ICARP has an opportunity to continue building adaptive capacity in California's most vulnerable communities. Lessons learned from ICARP's grant programs may also guide the State's other funding and capacity-building efforts. Developed based on the assessment of program participation and interviews with APGP grantees, the recommendations below focus first on opportunities to improve APGP and second on opportunities to improve funding for integrated and equitable adaptation planning in California broadly.[i]

IMPROVING THE ADAPTATION PLANNING GRANT PROGRAM

Continue to Enhance Program Accessibility and Transparency

ICARP received overwhelmingly positive feedback on Round 1. Specific highlights include the ease of navigating the application process, transparent and communicative staff, support of intentional and motivating local partnerships, and program design reflecting on-the-ground experience.[59] Round 1 feedback focused on program accessibility as a major challenge.

To effectively address accessibility challenges, APGP staff need to understand the key drivers of disparities in engagement. For example, regional differences in engagement and funding during Round 1–especially those that favor coastal regions of the

i For additional resources, see Appendix D, which includes a list of recent publications that focus on recommendations for improving adaptation funding.

state–show that APGP has further opportunities to improve program outreach. While population accounts for some differences in regional engagement, other factors like resource availability and viable project partnerships likely also play a role.

To address these and other barriers, ICARP should consider the following steps:

- **Expand technical assistance for navigating grant applications and sub-award contracting processes.** Provide priority for technical assistance to lead applicants from funding target groups in regions underrepresented in early engagement. In Round 1, a number of rural communities noted that the partnership requirements were a barrier to applying; consider technical assistance that involves early support for finding and establishing partnerships (see the recommendation on supporting social infrastructure below).
- **Continue to implement and expand advanced pay structures.** AB 590 provides select State agencies with the opportunity to offer limited advanced pay and outline conditions and processes. Given that Round 2 will be the first time APGP offers advanced pay, staff should make it a priority to gather feedback from grantees on the advanced pay processes and amend them accordingly.

APGP should also explore opportunities to enhance transparency in the grant application process. To do so, ICARP could:

- **Include in Program Guidelines that unawarded applicants will be offered written feedback and an opportunity to discuss application feedback.** In Rounds 1 and 2, APGP staff offered all unawarded applicants a 30-minute debrief session, as well as their application scoresheet upon request. However, staff could make clear in program guidelines that written feedback and an opportunity to discuss the application will be offered to all applicants who submit a complete application. In addition to helping build technical capacity in lead and partner applicant organizations, this step will make the grant process more transparent and supportive of first-time applicants.

Value and Support Soft Infrastructure in Planning Investments

'Hard' infrastructure refers to the physical systems (e.g., roads, buildings, parks, etc.) that enable a community to function. 'Soft' infrastructure refers to the human capital—and the systems, processes, and institutions that cultivate it–that enable a community to prosper.[60] Public health researchers have documented that the success of funding programs depends on investments in both hard and soft infrastructure.[61] However, soft infrastructure has applicability in climate adaptation contexts as well, including disaster recovery and risk management.[62] When programs are designed to value and emphasize cognitive, social, emotional, and relationship resources, communities are better able to build and sustain local capacity.

APGP provides an opportunity for adaptation planning investments to blend hard and soft infrastructure investments, especially through integrated, equity-oriented planning approaches. By supporting planning that seeks to build soft infrastructure, APGP can

better support the governance of adaptation strategies and the formation of meaningful partnership relationships while equipping communities with transferable skills. To do this, ICARP could take the following steps:

- **Encourage applicants to conduct an assessment of existing soft infrastructure.** Phase 1 of the adaptation planning process encourages practitioners to take stock of the resources and assets available to a community interested in exploring planning options; currently, these are defined as the knowledge, tools, data, and people who will lead the process.[63] APGP could require or encourage applicants to identify the available soft infrastructure (e.g., relationships, existing partnerships, community leaders, social centers, etc.) that might enable equitable outcomes, as well as gaps that need to be filled.
- **Dedicate funding for activities that enhance soft infrastructure.**[64] APGP could prioritize planning projects that invest in soft infrastructure by requiring that a certain percent of the proposed budget is dedicated to activities that build these assets, like community engagement (e.g., compensation for public participation) and workforce development. In addition to enhancing adaptive capacity, these steps can help build trust in government project leads, a common barrier to successful outcomes in historically marginalized communities.
- **Partner with technical assistance providers and community organizations to provide grantees with training opportunities and resources throughout the award period.** Building soft infrastructure capacity entails supporting applicants through the award period to ensure they have the tools to navigate unanticipated challenges. APGP could provide trainings, office hours, or online forums for grantees to share learnings with each other and seek support.

Adopt a Framework for Equitable Grant Monitoring and Evaluation

Given the evolving nature of the adaptation field, planning grant programs should incorporate monitoring and evaluation metrics to ensure that funded projects are achieving equitable outcomes and that the grant program itself is meeting its goals. Monitoring and evaluation are particularly important for ensuring the programs do not encourage maladaptation, which could further inequities and lead to long-term physical and fiscal consequences.

The Greenlining Institute's *Making Equity Real in Climate Adaptation and Community Resilience Policies and Programs: A Guidebook* provides comprehensive recommendations for and strategies to achieve equitable program and project evaluation. Recommendations adapted from the report include:

- **Contracting with a third-party provider to conduct a regular program evaluation.** The evaluation should involve all program participants, including program administrators, advisors, applicants, and awardees, through various evaluation convenings. Results from the evaluation should be presented to an equity advisory body (or some other group of interested parties) for feedback and improvement.

- **Include a project evaluation requirement in the program guidelines and provide an evaluation template and resources to support applications.** Monitoring and evaluation requirements are typically a hurdle for under resourced communities to participate in grant programs, given the staff time required to adhere to them. Given that neither Round 1 nor Round 2 of APGP require project evaluation by grantees, ICARP could convene grantees from Rounds 1 and 2 to co-develop an evaluation framework that would benefit both grantees and the program, informed by the experiences of Rounds 1 and 2 participants, while balancing limited staff time.

IMPROVING THE ADAPTATION PLANNING FUNDING LANDSCAPE

Sustain Ongoing Funding for Adaptation Planning

The State administers a comprehensive suite of adaptation and resilience grant programs in addition to APGP. This includes other programs administered by ICARP (the Regional Resilience Planning and Implementation Grant Program (RRGP) and Extreme Heat and Community Resilience Grant Program), as well as by other agencies and departments that focus on specific outcomes and sectors. The latter includes programs administered by the Strategic Growth Council (e.g., Transformative Climate Communities (TCC), Community Resilience Centers (CRC), and Regional Climate Collaboratives (RCC)), the State Transportation Agency (e.g., Sustainable Transportation Planning grants), and the California Environmental Protection Agency (e.g., Environmental Justice Small Grants). Together, these programs facilitate the development of project pathways by prioritizing funding for vulnerable communities and emphasizing planning and implementation actions that build resilience and adaptive capacity.

Each program is highly competitive and oversubscribed (see Table 6 below). During RRGP's first round, demand for planning funds was more than five times the amount available;[65] the CRC program received 87 applications–totaling $37 million in requested funds—for the $5 million made available in funding for Round 1;[66] and in the first round of SGC's RCC program, staff received 45 applications representing 300 unique nonprofit, CBO, and local government entities from 42 counties applying for what would have totaled $66.6 million in awards–SGC was able to distribute $8.5 million in total across six climate collaboratives.[67]

PROGRAM	ROUND	YEAR[j]	FUNDING AVAILABLE	FUNDING REQUESTED	PERCENT OVERSUBSCRIBED
Adaptation Planning Grant Program (APGP)	Round 1	2023	$8,000,000	$63,000,000[k]	787%
Regional Resilience Planning and Implementation Grant Program (RRGP)	Round 1	2023	$21,700,000	$106,647,000	491%

j Calendar year in which the awarded projects were announced.

k Via the Intent-to-Apply Survey, which is considered the first step in the APGP application process.

PROGRAM	ROUND	YEAR[J]	FUNDING AVAILABLE	FUNDING REQUESTED	PERCENT OVERSUBSCRIBED
Community Resilience Centers (CRC) Program	Round 1	2024	$5,000,000	$37,000,000	740%
Regional Climate Collaboratives (RCC) Program	Round 1	2022	$8,500,000	$66,600,000	783%
Caltrans Senate Bill 1 (SB1) Adaptation Planning Grant Program	Round 3	2019	$6,000,000	$12,500,00	208%
Caltrans Sustainable Communities Competitive and Strategic Partnerships Grants	Round 4	2023	$41,600,00	$66,800,000	160%

Table 6. Summary of Oversubscription to the State's Adaptation and Resilience Grant Programs.

"Without APGP funding, many cities would have deficits, and they wouldn't have an avenue to even work on Climate Action Plans. And because many cities don't have allocated general funds for sustainability, these grants are essential to helping cities think about climate change and positive programs—[they] are so critical to being able to implement these programs."

APGP Round 1 Grantee

Practitioners in the adaptation community frequently make the call for sustained funding, which builds capacity at the State and within grantee organizations. Continued fiscal support of programs like APGP benefits not only APGP funding recipients but all engaged organizations. Through these programs, applicants are exposed to other funding opportunities, develop stronger relationships with State grant program staff, and refine their proposals for climate adaptation planning initiatives so that future proposals are both more competitive for funding and overall better.

"APGP was a catalyst for us to pursue thinking about ways in which we could create or strengthen the pipeline of early conceptual ideas for climate resilient infrastructure projects in the county that were multi-benefit, community-supported, and even community-led in some cases. Before APGP, we didn't really have a good way to create that pipeline of projects."

APGP Round 1 Grantee

Enable ICARP to Provide Navigation Support for the Adaptation Funding Landscape

Adaptation practitioners and program applicants work across the programs mentioned above to meet funding needs. During interviews, APGP Round 1 grantees noted that they have and will continue to engage with other State grant funding programs to fill

gaps in existing project financing needs and address other adaptation and resilience planning efforts. Nonetheless, navigating this complex and competitive funding landscape posed a challenge for applicants,[68] especially those seeking support for early-stage adaptation activities or representing under-resourced communities.

OPR staff were able to support some applicants and grantees in navigating the funding landscape; one grantee flagged that engaging with APGP helped them better understand the other funding opportunities available to them, build stronger relationships with State programs and staff, and draw connections between planned climate initiatives and funding strategies.[69] In this way, OPR staff currently serve as informal navigational support for program applicants and engaged organizations.

However, for OPR staff to serve in this navigator role, the State must commit to continued, multi-year funding of its planning grant programs. The State can support capacity-building efforts and help address some of the core inequities in adaptation planning by ensuring that the hiring of full-time staff at both the State and local level is an eligible cost for ongoing funding programs. To continue providing navigational support as a resource, programs like APGP also need structural support to align their processes with other funding opportunities across State agencies, ensuring more efficient and equitable access to State funds for adaptation planning and implementation.

"While we're very grateful for APGP, more funding would allow us to conduct more robust outreach, compensate outreach participants, broaden the methodology we have for our technical analysis, as well as have more spaciousness in terms of capacity and time to do this work well."

APGP Round 1 Grantee

Align State Adaptation Funding Across State Programs and with Federal Climate Resilience Funding

A whole-of-government approach to climate adaptation necessitates alignment at multiple levels of government and across government components. Through intentional program design, increased information sharing, and interagency coordination, the State can better support communities seeking to take advantage of new opportunities to fund adaptation work being made available via the Federal government's 'whole-of-government' approach to climate change.[70]

APGP piloted the integration of plan alignment through Round 1 to support communities in navigating various local, state, and federal planning requirements. In Round 2, APGP staff further emphasized the need for proposed projects to align with and integrate climate resilience funding opportunities. Several Round 1 APGP grantees intend to use the funds awarded to support adaptation planning activities that are aligned with or built into other plan updates or meet new State mandates around General Plans (e.g., the development of an environmental justice element per SB 1000).[71] Grantees also noted that plans supported by APGP funding would make them eligible for federal implementation funds, such as those made available through the Infrastructure Investment and Jobs Act or FEMA. To be eligible for FEMA's Hazard

Mitigation Assistance grant programs, applicants must have an approved Local Hazard Mitigation Plan (LHMP); elevating climate adaptation in LHMPs via State funding is a prime example of both plan alignment and integrated financing strategies.

APGP's commitment to funding projects that emphasize plan alignment and integrated financing strategies enables communities to be well-positioned to navigate both the State and Federal adaptation funding landscape. However, other challenges persist for applicants looking to link their State-awarded planning funding with Federal dollars. The most significant of these is a misalignment in grant program timelines, which leaves applicants with the difficult decision of choosing between grants rather than strategically linking opportunities to help develop planning to implementation pathways. There is an opportunity for the State to refine its granting timelines to specifically support applicants who are also interested in Federal opportunities; additionally, the State can provide better guidance for applicants on which State-funded programs seek to generate deliverables (e.g., climate action plans) that would make applicants eligible for Federal funding.

VI. CONCLUSION

As the impacts of climate change increase in frequency and severity, California communities need to adapt to shifting baseline conditions and extreme events. Adaptation planning enables community members to identify key climate risks, assess the costs and benefits of climate adaptation strategies, explore financing options for implementation, and engage communities–especially those most vulnerable to impacts–in building resilience and adaptive capacity. Planning links vulnerability assessment to the implementation phase of the adaptation process. Strategic adaptation plans can support more efficient decision-making around implementation strategies. For communities to adapt to climate change effectively and equitably, they must have access to the funding, staff capacity, and technical expertise necessary to ensure proactive and comprehensive planning.

Addressing major gaps: ICARP's APGP supports California's local, regional, and Tribal communities in planning for the impacts of climate change through the funding of equitable, multi-benefit projects. APGP addresses a major gap in adaptation funding for practitioners looking to develop strategic plans addressing multiple risks to disadvantaged and vulnerable communities. Not only does APGP fund plan development, but the program's emphasis on community engagement and capacity building ensures that funds are used to support sustainable processes through staff hiring, technical assistance, and creative financing.

Meeting a diversity of needs: APGP awarded $8 million to 14 projects in its first round of funding and will award an additional $9.5 million in Round 2. Demand for program funds was nearly eight times the available amount of funding in Round 1, a pattern likely to continue in Round 2. Projects funded by APGP cover a wide range of climate risks and incorporate innovative strategies for addressing inequity, engaging communities, and financing ongoing planning efforts. In its second round, APGP built on early successes to continue ensuring equitable engagement opportunities and funding distribution, as well as increased accessibility and flexibility for program applicants.

Building implementation pathways: The planning processes made possible by APGP will provide direct benefits to communities at the forefront of the climate crisis in California. These funds will also help build local capacity and

support communities in navigating the funding landscape, ultimately ensuring projects progress down the planning to implementation pathway. As climate impacts become more widespread, meeting the State's resilience goals will require implementing adaptation strategies that have been comprehensively planned to minimize risk and maximize benefit. APGP, along with the support of ICARP's staff and related programs, are a critical component of the State's efforts to build a more resilient and equitable future for all of California.

Progress on Awarded Projects: As of Spring 2024, projects funded in Round 1 of APGP are underway, and staff have released the Notice of Available Funding, Program Guidelines, Pre-Application Form, and Application Materials for Round 2. Staff anticipates announcing Round 2 Grantees in Summer 2024. As Round 1 projects progress, APGP staff will post updates to https://resilientca.org/; final Case Studies from Grantees will be available on the State's Adaptation Clearinghouse.

APPENDIX A. CLIMATE CHANGE COSTS AND ADAPTATION INVESTMENTS

The costs of climate change can be grouped into three categories: (1) infrastructure damage and maintenance, (2) disruption of business operations and key industries (food production, utilities, etc.), and (3) insurance costs and financial risks (see Table 7).

Climate change will directly affect infrastructure via damage, increased maintenance, repairs, and rebuilding efforts.[72] By 2050, $8 billion and $10 billion of existing property in California will be underwater under current sea level rise projects; high tides, like those experienced during King Tide events, will put an additional $6 to $10 billion at risk. By 2100, and with the potential impacts of a 100-year storm event, that estimate could be as high as $150 billion in property value.[73] California's most recent wildfire seasons are estimated to have caused $9.9 billion in property damage, $386 million in fatalities (using the federal Environmental Protection Agency's "value of a statistical life"), and $1.3 billion in State response costs annually.[74]

In addition to direct impacts, climate change will result in economic disruption.[75] Climate-induced disasters and extreme weather events, including wildfires, flooding, storms, and heat waves, are already reducing many industries' capacity to operate at the level of production seen in the past. This is particularly true for outdoor industries,[76] which currently employ 30% of California's workforce.[77] The most significant economic losses are often from reduced worker hours due to dangerous working conditions (e.g., poor air quality from wildfire smoke, extreme heat, and climate-related diseases such as valley fever) and damage to inter-connecting infrastructure systems, which can lead to ripple effects across sectors.

Insurance and financial markets will also incur additional costs due to climate change,[78] especially those associated with damage to property–estimates put the value of coastal property vulnerable to sea level rise in the Bay Area alone at $62 billion.[79] Much of this cost could be passed on to consumers who will need to insure homes in flood zones and wildfire high-severity zones. The healthcare industry is also likely to see dramatic increases in use, resulting in higher costs to health insurance companies and consumers due to additional strains on healthcare and emergency services.[80] Higher use will result from wildfires, storms, extreme heat, and air quality; ozone and PM 2.5 accumulation currently contribute to 8,8000 premature deaths and over $70 billion in healthcare costs annually in California, with most of the impact in the San Joaquin Valley and parts of the South Coast region.[81]

COST CATEGORY	ANTICIPATED IMPACTS	EXAMPLES OF ESTIMATED COSTS
Infrastructure Damage and Maintenance	Sea-level rise causes damage to coastal properties and infrastructure (like transportation and water infrastructure) via flooding, storm damage, etc.	[82]By 2050: $8-20 billion in assets at risk By 2100: $33-150 billion in assets at risk
	[83]Wildfires damage property and infrastructure and require major investments in response efforts, evacuations, and rebuilding.	$9.9 billion in property damage and $1.3 billion in response costs
[84]Disruption of Business Operations and Key Industries	Wildfires, extreme heat, and storms cause damage to the infrastructure necessary for California's key businesses and industries to continue operations. [85]Climate change also impacts worker health, safety, and productivity, particularly in outdoor industries.	[86]$386 million in fatalities from wildfire alone [87]Unestimated costs for extreme heat and extreme storm impacts, as well as any impacts on worker-hours-lost
[88]Insurance Costs and Financial Risks	Extreme heat, wildfires, and climate-related diseases will cause increased demand for healthcare, leading to higher insurance costs.	$70 billion in healthcare costs associated with PM2.5 exposure
	[89]Wildfires, flooding, and storm events will impact insurance costs for at-risk properties.	Unestimated costs to insurance companies and property owners

Table 7. Examples of observed and anticipated climate impacts with economic consequences for three cost categories, including examples of estimated costs.

In addition to the three categories of climate change costs detailed above, the development and maintenance of adaptation strategies require upfront and ongoing financing. Still, investments in adaptation are proven to reduce the costs of climate change (damages, disruption of industry, insurance markets, etc.). Notably, with increasing adaptation costs, climate change costs are reduced, sometimes taking residual costs close to zero (see Figure 8).

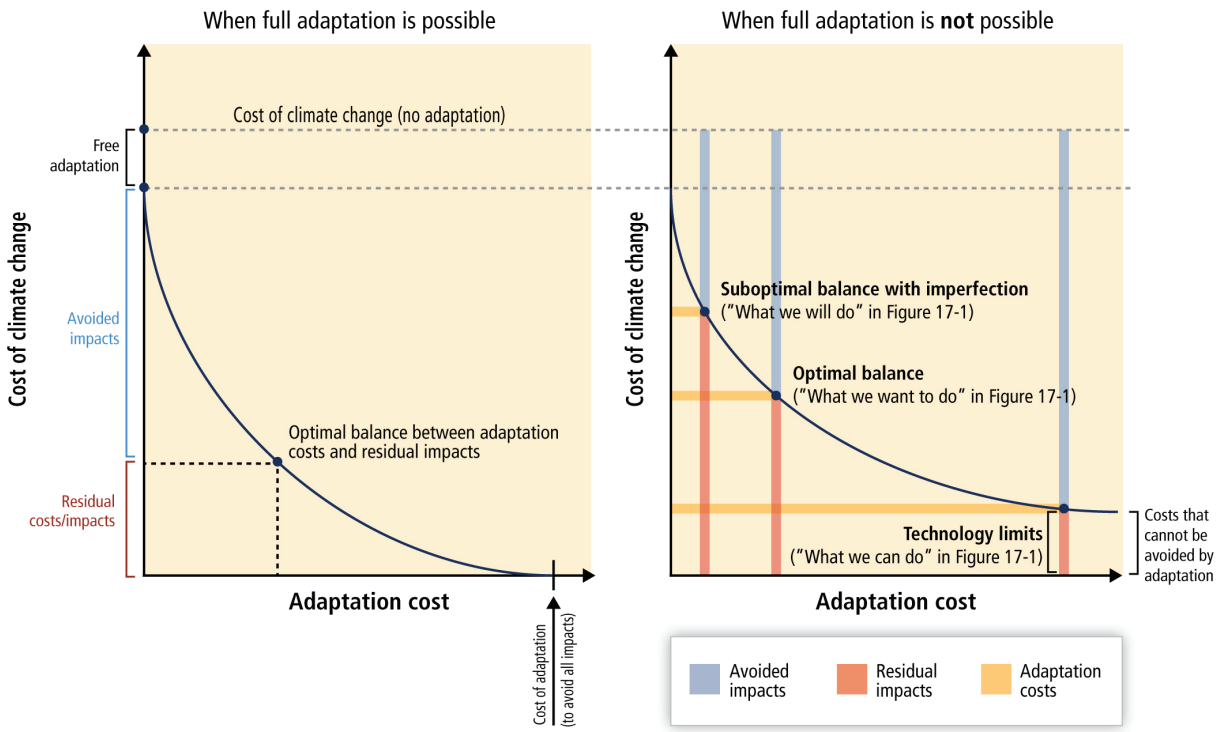


Figure 8. Graphical representation of the link between the cost of adaptation (on the x-axis) and the residual cost of climate change (on the y-axis). The left panel represents a case where full adaptation is possible, while the right panel represents a case in which there are unavoidable residual costs. Source: International Panel on Climate Change Working Group II.[90]

APPENDIX B. KEY STATE ACTIONS FACILITATING CLIMATE ADAPTATION AND RESILIENCE

LEGISLATION	YEAR/S	OVERVIEW
California Climate Change Assessments, with updates required by SB 1320 (Stern, 2020)	[91]2006, 2009, 2012, 2018, upcoming in 2026	California's Fourth Climate Change Assessment (2018) included new climate projections data and a suite of technical, regional, and statewide research reports to understand climate risk and support adaptation efforts at the local, regional, and state level, [92]to be expanded further by the Fifth Assessment in 2024.
[93]California Climate Adaptation Strategy, with updates required by AB 1482 (Gordon, 2016)	[94]2009, 2014, 2018, 2022	The Climate Adaptation Strategy links the state's adaptation efforts to assess progress toward California's six climate resilience priorities. [95]State law requires that the State update the Adaptation Strategy at least every five years.
California Adaptation Planning Guide	2012, 2020	The Adaptation Planning Guide provides adaptation planning resources to local, regional, and tribal governments.
[96]SB 379	2015	Senate Bill 379 requires local governments to address climate change in the Safety Element of General Plans, or in a standalone adaptation strategy.
Integrated Climate Adaptation and Resiliency Program (ICARP)	2015	ICARP, a program within OPR, manages regional and local climate adaptation grants, convenes a Technical Advisory Committee on climate adaptation, and maintains the Adaptation Clearinghouse resource for local governments.
[97]2021-2022 State Budget	2021-2022	Significant investments across a suite of climate resilience priorities, including the founding of APGP, the Regional Resilience Planning and Implementation Grant Program (RRGP), and the Extreme Heat and Community Resilience Program, as well as California's Fifth Climate Change Assessment, currently underway.

APPENDIX C: EXAMPLES OF CLIMATE RESILIENCE INVESTMENTS IN THE 2021-22 BUDGET[98]

SECTION/ITEM	AMOUNT	ALLOCATION	AGENCY/DEPARTMENT
Section 15, Item 0650-001-0001	$10,000,000	Climate adaptation and resilience planning grants under the Adaptation Planning Grants Program	OPR (ICARP)
Section 16, Item 0650-101-0001	$25,000,000	Grants for local, regional, and tribal governments for climate resilience planning under RRGP	OPR (ICARP)
Section 13, Item 0555-102-0001	$10,000,000	Adaptation planning by community-based organizations	California Environmental Protection Agency
Section 45, Item 3540-001-0001	$100,000,000	Near-term forest resilience and wildfire prevention	Department of Forestry and Fire Protection
Section 45, Item 3540-001-0001	$67,000,000	Long-term forest resilience and wildfire prevention	Department of Forestry and Fire Protection
Section 59, Item 3790-001-0001	$11,500,000	Addressing climate risks such as fire, floods, and sea level rise	Department of Parks and Recreation
Section 82, Item 3860-301-0001	$197,000,000	Manage flood risk and improve climate resilience	Department of Water Resources

APPENDIX D. RESOURCES ON IMPROVING ADAPTATION AND RESILIENCE FUNDING

Mary Buchanan and Joanna Wozniak-Brown, "Barriers to Equity Within Environmental Justice and Climate Justice Grant Programs," *Journal of Climate Resilience and Justice* 1 (September 5, 2023): 119–33, https://doi.org/10.1162/crcj_a_00001.

Matthew Solomon, John Michael LaSalle, and Chris Grant, "California Landscape of Climate Finance (BETA)" (Climate Policy Initiative, January 29, 2024).

Alexis Robert et al., "Proposed Funding Pathways for Adaptation to Climate Change in California" (OnClimate LLC and Resources Legacy Fund, April 30, 2021).

"Ounce of Prevention: Advancing Equitable Climate Resilience Planning in California" (Farallon Strategies and Climate Resolve, April 14, 2023), climateresolve.org.

"Volume 1: Recommendations Report," Climate Crossroads: California's Readiness to Act on Climate Resilience (Resilient Cities Catalyst (RCC), Farallon Strategies and CivicWell, 2023).

REFERENCES

1 California Office of Environmental Health Hazard Assessment (CalOEHHA), SB 535 Disadvantaged Communities, available at https://oehha.ca.gov/calenviroscreen/sb535

2 Governor's Office of Planning and Research (OPR), Tribal Consultation Guidelines (Nov 14, 2005), available at https://nahc.ca.gov/wp-content/uploads/2019/04/SB-18-Tribal-Consultation-Guidelines.pdf

3 The White House, Justice40, available at https://www.whitehouse.gov/environmentaljustice/justice40/

4 Executive Office of the President, Memorandum for the Heads of Executive Departments and Agencies, available at https://www.whitehouse.gov/wp-content/uploads/2023/01/M-23-09_Signed_CEQ_CPO.pdf

5 Governor's Office of Planning and Research (OPR), *Defining Vulnerable Communities in the Context of Climate Adaptation* (2018), available at https://opr.ca.gov/docs/20200720-Vulnerable_Communities.pdf.

6 European Environment Agency, *Assessing the costs and benefits of climate change adaptation* (2023), available at https://www.eea.europa.eu/publications/assesing-the-costs-and-benefits-of.

7 Alexa K. Jay et al., *Ch. 1. Overview: Understanding risks, impacts, and responses,* In: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA (2023), available at https://doi.org/10.7930/NCA5.2023.CH1.

8 Solomon Hsiang et al., *Ch. 19. Economics. In: Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA (2023), available at https://doi.org/10.7930/NCA5.2023.CH19.

9 James Paci et al., *The Economic, Fiscal, and Environmental Costs of Wildfires in California*, Gordon and Betty Moore Foundation (June 27, 2023), available at https://www.moore.org/docs/default-source/default-document-library/the-economic-fiscal-and-environmental-costs-of-wildfires-in-ca.pdf?sfvrsn=1b1b620c_0.

10 Hanna Payne, Louise Bedsworth, and Ken Alex, *California Jobs First Regional Plan Part 1: Section 3.3 Regional Summary: Climate and Environmental Impacts*, Center for Law, Energy & the Environment, UC Berkeley School of Law, Berkeley, CA, on behalf of Bay Area Jobs First Collaborative (2023), available at https://www.allhomeca.org/california-jobs-first/.

11 Paci et al., *supra* note 9.

12 Marshall Burke et al., "The contribution of wildfire to PM2.5 trends in the USA," *Nature* (September 20, 2023), available at: https://www.nature.com/articles/s41586-023-06522-6.

13 Muyeye Chambwera et al., *Economics of adaptation. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects.* Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, (2014) pp. 945-977, available at https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-Chap17_FINAL.pdf.

14 European Environment Agency, *Assessing the costs and benefits of climate change adaptation* (2023), available at https://www.eea.europa.eu/publications/assesing-the-costs-and-benefits-of.

15 Governor's Office of Planning and Research (OPR), "Climate Equity" (webpage), available at https://resilientca.org/topics/climate-equity/#climate-vulnerability.

16 Senate Bill 170 (Skinner, Chapter 240, Budget Act of 2021), available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB170.

17 California's Climate Assessment, "About the Assessment" (webpage), available at https://climateassessment.ca.gov/about/.

18 Louise Bedsworth et al., *California's Fourth Climate Change Assessment: Statewide Summary Report*, California Governor's Office of Planning and Research et al. (2018), available at https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf.

19 Governor's Office of Planning and Research (OPR), "California's Fifth Climate Change Assessment" (webpage), available at https://opr.ca.gov/climate/icarp/climate-assessment/.

20 Senate Bill 170, *supra* note 16.

21 California Governor's Office of Emergency Services (CalOES), *California Adaptation Planning Guide* (June 2020), available at https://resilientca.org/apg/.

22 Susanne C. Moser et al., "Growing Effort, Growing Challenge: Findings from the 2016 California Coastal Adaptation Needs Assessment," Susanne Moser Research & Consulting and U.S. Geological Survey (2016), California's Fourth Climate Change Assessment, available at https://www.energy.ca.gov/sites/default/files/2019-12/Oceans_CCCA4-EXT-2018-009_ada.pdf.

23 Hsiang et al., *supra* note 8.

24 E. Lisa F. Schipper, "Maladaptation: When Adaptation to Climate Change Goes Very Wrong," *One Earth* 3, no. 4 (October 23, 2020): 409–14, available at https://doi.org/10.1016/j.oneear.2020.09.014.

25 Tina Yuen et al., *Guide To Equitable, Community-Driven Climate Preparedness Planning* (2017), available at https://www.usdn.org/uploads/cms/documents/usdn_guide_to_equitable_community-driven_climate_preparedness-_high_res.pdf.

26 CalOES, *supra* note 21.

27 OPR, *supra* note 6.

28 Yuen et al., *supra* note 25.

29 OPR, *supra* note 15.

30 Michelle A. Hummel and Mark T. Stacey, "Assessing the Influence of Shoreline Adaptation on Tidal Hydrodynamics: The Role of Shoreline Typologies," *Journal of Geophysical Research: Oceans* 126, no. 2 (2021): e2020JC016705, available at https://doi.org/10.1029/2020JC016705.

31 "Regional Planning for Sea-Level Rise Is Key to Environmental Justice," *Bay Area Monitor* (blog), available at https://bayareamonitor.org/article/regional-planning-for-sea-level-rise-is-key-to-environmental-justice/.

32 Lara J. Cushing et al., "Toxic Tides and Environmental Injustice: Social Vulnerability to Sea Level Rise and Flooding of Hazardous Sites in Coastal California," *Environmental Science & Technology* 57, no. 19 (May 16, 2023): 7370–81, https://doi.org/10.1021/acs.est.2c07481.

33 A. Nardone, N. Thakur, and J.r. Balmes, "Historic Redlining and Asthma Exacerbations Across Eight Cities of California: A Foray into How Historic Maps Are Associated with Asthma Risk," in *D96. ENVIRONMENTAL ASTHMA EPIDEMIOLOGY*, 296 vols., American Thoracic Society International Conference Abstracts (American Thoracic Society, 2019), A7054–A7054, https://doi.org/10.1164/ajrccm-conference.2019.199.1_MeetingAbstracts.A7054.

34 Seth B. Shonkoff et al., "The Climate Gap: Environmental Health and Equity Implications of Climate Change and Mitigation Policies in California—a Review of the Literature," *Climatic Change* 109, no. Suppl 1 (December 1, 2011): 485–503, https://doi.org/10.1007/s10584-011-0310-7.

35 Clara Fang et al., *Centering Equity in Climate Resilience Planning and Action: A Practitioner's Guide* (2022), Climate-Smart Communities Series, Vol. 3. Antioch University New England, available at https://library.oarcloud.noaa.gov/noaa_documents.lib/OAR/CPO/Climate_Smart_Communities/Vol_03_CSC_CenteringEquity.pdf.

36 Governor's Office of Planning and Research (OPR), "Plan Alignment" (webpage), available at https://resilientca.org/plan-alignment/.

37 Susanne C. Moser et al., *Adaptation Finance Challenges: Characteristic Patterns Facing California Local Governments and Ways to Overcome Them.* California's Fourth Climate Change Assessment, California Natural Resources Agency (2018), available at https://www.energy.ca.gov/sites/default/files/2019-12/Governance_CCCA4-CNRA-2018-007_ada.pdf; Moser et al. *supra* note 22.

38 OPR, *supra* note 36.

39 Moser et al. *supra* note 22; Moser et al. *supra* note 37.

40 Fang et al., *supra* note 35.

41 Resilient Cities Catalyst, "FAQ — Resilient Cities Catalyst" (webpage), available at https://www.rcc.city/crp-projectprep-faq.

42 Andrew Garbutt, "Shovel Ready vs. Shovel Worthy," Route Fifty (2023), available at https://www.route-fifty.com/infrastructure/2023/05/shovel-ready-vs-shovel-worthy/386012/.

43 Moser et al., *supra* note 37.

44 Emily Wasley et al., *Ch. 31. Adaptation. In: Fifth National Climate Assessment*, Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA (2023), available at https://doi.org/10.7930/NCA5.2023.CH31.

45 Louise Bedsworth et al., *Getting to Implementation: The Status of Local Climate Action in California*, The Center for Law, Energy & the Environment at UC Berkeley School of Law, The Institute for Local Government, and Next10 (2023), available at https://www.law.berkeley.edu/research/clee/research/climate/california-climate-action/the-status-of-local-climate-action-in-california; Moser et al., *supra* note 37.

46 Integrated Climate Adaptation and Resilience Program (ICARP), *Adaptation Planning Grant Program Round 1 Program Guidelines FY 2022 - 2023* (2023), available at https://opr.ca.gov/climate/icarp/grants/apgp-round-1-resources.html.

47 Governor's Office of Planning and Research (OPR), "California Awards $8 Million to help communities strengthen resilience against growing climate impacts" (webpage), available at https://opr.ca.gov/news/2023/06-01.html.

48 Interviews with APGP Round 1 Grantees.

49 Interviews with APGP Round 1 Grantees.

50 APGP Round 1 Feedback Survey results and Interviews with APGP Round 1 Grantees.

51 Integrated Climate Adaptation and Resilience Program (ICARP), *Adaptation Planning Grant Program Round 2 Program Guidelines FY 2023 - 2024* (2024), available at https://opr.ca.gov/climate/icarp/grants/adaptation-planning-grant.html.

52 *Ibid.*

53 Governor's Office of Planning and Research (OPR) and The Center for Law, Energy, and the Environment at UC Berkeley School of Law (CLEE), *An Initial Review of the ICARP Regional Resilience Planning and Implementation Grant Program* (2023), available at https://opr.ca.gov/climate/icarp/grants/regional-resilience-grant.html.

54 Teodore Grantham et al., *North Coast Summary Report, California's Fourth Climate Change Assessment*, University of California, Berkeley (2018), available at https://www.climateassessment.ca.gov/regions/.

55 Angel Santiago Fernandez-Bou et al., *Regional Report for the San Joaquin Valley Region on Impacts of Climate Change*, California Natural Resources Agency (2021), available at https://www.climateassessment.ca.gov/regions/.

56 Bedsworth et al., *supra* note 18.

57 ICARP, *supra* note 51.

58 CalOES, *supra* note 21.

59 APGP Round 1 Feedback Survey results and Interviews with APGP Round 1 Grantees.

60 "The Difference Between Soft And Hard Infrastructure, And Why It Matters," *StateImpact New Hampshire* (blog), available at https://stateimpact.npr.org/new-hampshire/2011/10/26/infrustructure-soft-and-hard/.

61 Shane A. Kavanagh et al., "Soft Infrastructure: The Critical Community-Level Resources Reportedly Needed for Program Success," *BMC Public Health* 22, no. 1 (March 2, 2022): 420, available at https://doi.org/10.1186/s12889-022-12788-8 .

62 United Nations, "The Relevance of Soft Infrastructure in Disaster Management and Risk Reduction," United Nations (United Nations), available at https://www.un.org/en/chronicle/article/relevance-soft-infrastructure-disaster-management-and-risk-reduction.

63 CalOES, *supra* note 21.

64 The Greenling Institute, *Making Equity Real in Climate Adaptation and Community Resilience Policies and Programs* (2019), available at https://greenlining.org/wp-content/uploads/2019/08/Making-Equity-Real-in-Climate-Adaption-and-Community-Resilience-Policies-and-Programs-A-Guidebook-1.pdf.

65 OPR and CLEE, *supra* note 53.

66 California Strategic Growth Council, "California Invests $5 Million to Help Communities Build Climate and Community Resilience" (February 28th, 2024), available at https://sgc.ca.gov/news/2024/02-28.html.

67 California Strategic Growth Council, "California Invests $8.5 Million to Help Communities Accelerate Climate Action" (December 15th, 2022), available at https://sgc.ca.gov/news/2022/12-15a.html.

68 Interview with APGP Round 1 Grantee; OPR and CLEE, *supra* note 53.

69 Interview with APGP Round 1 Grantee.

70 U.S. Department of State, "The Climate Crisis: Working Together for Future Generations" (webpage), available at https://www.state.gov/policy-issues/climate-crisis/.

71 Interview with APGP Round 1 Grantee.

72 Jochen Hinkel et al., "Coastal flood damage and adaptation costs under 21st century sea-level rise", PNAS (2014), available at https://www.pnas.org/doi/full/10.1073/pnas.1222469111.

73 Gabriel Petek, *What Threat Does Sea Level Rise Pose to California*, Legislative Analysts Office (2020), available at https://lao.ca.gov/Publications/Report/4261.

74 Paci et al., *supra* note 9.

75 Payne et al., *supra* note 10.

76 *Ibid.*

77 Jamesine Rogers, James Barba, and Fiona Kinniburgh, *From Boom to Bust? Climate Risk in the Golden State*, Risky Business: The Economic Risks of Climate Change in the United States (April 2015), available at https://riskybusiness.org/report/from-boom-to-bust-climate-risk-in-the-golden-state/.

78 Hsiang et al., *supra* note 8.

79 Rogers et al., *supra* note 78.

80 Paci et al., *supra* note 9.

81 Rogers et al., *supra* note 78.

82 Hinkel et al., *supra* note 73.

83 Petek, *supra* note 74.

84 Paci et al., *supra* note 9.

85 Payne et al., *supra* note 10.

86 Rogers et al., *supra* note 78.

87 Paci et al., *supra* note 9.

88 Payne et al., *supra* note 10; Rogers et al., *supra* note 78.

89 Rogers et al., *supra* note 78.

90 Chambwera et al., *supra* note 13.

91 Senate Bill 1320 (Stern, Chapter 136, Statutes of 2020), available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201920200SB1320.

92 Bedsworth et al., *supra* note 18.

93 *Ibid*.

94 Assembly Bill 1482 (Gordon, Chapter 603, Statutes of 2015), available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB1482.

95 Natural Resources Agency, "Climate Adaptation Strategy" (webpage), available at https://climateresilience.ca.gov/.

96 CalOES, *supra* note 21.

97 Senate Bill 246 (Wieckowski, Chapter 606, Statutes of 2015), available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB246.

98 *Ibid*.

Berkeley Law

Center for Law, Energy, & the Environment

Center for Law, Energy & the Environment
University of California
Berkeley School of Law
1995 University Avenue, Suite 460
Berkeley, CA 94704

clee.berkeley.edu
TWITTER: @CLEEBerkeley
FACEBOOK: @CLEEBerkeley
INSTAGRAM: @CLEEBerkeley
LINKEDIN: Center for Law, Energy & the Environment