

**Enhancing Health Resilience to Climate Change through
Adaptation**

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Project Narrative

Background

Overview

Climate change is happening now and faster than expected. While climate change is a global problem, its impacts will be local and threaten the security and well-being of San Franciscans. Climate change is expected to increase temperatures, change precipitation patterns, increase the frequency and severity of extreme weather events, and increase sea-level rise—all of which will have significant and cascading effects on the environment, economy, and public health. By 2100, extreme heat is projected increase between 4.1 and 6.2 degrees, and the number of extreme heat days (currently any day over 85F) are projected to increase by 90. Local sea levels are projected to rise while extreme storms are expected to increase in both frequency and intensity. By 2100, these forces will combine to exacerbate flood inundation with storm surge from a 100-year storm projected to be 77 inches. In 2015, California entered the fourth year of severe drought. Climate models project that droughts will only worsen with climate change.

Climate impacts are associated with numerous health impacts. Higher temperatures will increase rates of heat-related illness and heat-related mortality. Worsened air quality will exacerbate respiratory illnesses and trigger asthma symptoms. Flood inundation will increase exposure to molds, change the distribution of disease vectors, and increase rates of waterborne illness. Power outages associated with extreme weather events will reduce access to city resources. Additional indirect impacts of climate change include income loss from increased food costs or property damage, and mental health impacts including anxiety and depression.

The impacts from climate change are expected to disproportionately affect the communities least able to absorb them. The extent to which a population is affected may be modified by their socioeconomic status, quality of local infrastructure, pre-existing health conditions, and environmental exposure. Socioeconomic indicators of increased climate risk include age, income, race, level of educational attainment, and language. Infrastructure and built environment indicators include housing quality, impervious surface, and proximity to transportation. Pre-existing health indicators include asthma rates, mental health conditions, and diabetes rates. Climate change's disproportionate impact is referred to as the climate gap. One of main objectives throughout this cooperative agreement will be to implement interventions to address the climate gap. Successful implementation of interventions to climate change will 1) help serve marginalized communities, 2) improve health equity and 3) serve as a model for other local health departments.

Relevant Work

The impacts of climate change on human health are a major concern, particularly for populations with known health disparities. In 2010, San Francisco Department of Public Health (SFDPH) established the Climate and Health Program with the support of funding from the CDC. The purpose of San Francisco's Climate and Health Program is to address the public health consequences of climate change and its implications on human health. The program has

conducted various analyses assessing climate trends, defining disease burden, developing specific intervention methods, and evaluating effects of climate change for at-risk populations within San Francisco to:

- Promote community resilience through education, empowerment and engagement to reduce vulnerability to climate change.
- Increase both local level capacity and internal department capacity to utilize climate health science.
- Incorporate stakeholder engagement in the development of climate change mitigation and adaptation actions.
- Implement adaptation efforts which achieve health co-benefits and improve health disparities.
- Serve as a model for local health departments.
- Educate stakeholders on health impacts of climate change and adaptation plans.

Some of the Climate Health Program's key successes and outcomes include:

- The San Francisco Climate and Health Profile that summarizes how climate change is expected to impact San Francisco, which populations are most and least resilient to these impacts, and where those populations live. The Climate and Health Profile won second prize in the National Institute of Environmental Health Sciences (NIEHS)'s Climate Change and Environmental Exposures Challenge and is featured in the U.S. Climate Resilience Toolkit.
- The Extreme Heat Vulnerability Assessment and Flood Health Vulnerability Assessment, which is used to investigate and trace the pathways that will link climate impacts to health outcomes to vulnerable populations.
- Community Resiliency Indicator System, Flood Health Index, and Heat Vulnerability Index. These rubrics systematically compare the resiliency and vulnerability of San Francisco neighborhoods in order to allocate resources, plan interventions, and advocate for policies and programs
- Emergency plans and educational and outreach material for adaptation. This has included a Heat, Extreme Storm and a Flood Emergency Operations Plan and associated outreach materials on heat, flooding, extreme storms, and sheltering in place.
- A draft Climate and Health Adaptation Plan (Appendix A)
- The Climate and Health Program's work has been recognized by The White House, C40 and presented at the 21st Conference of Parties to the United Nations Framework Convention on Climate Change (COP21) as concrete city solutions to climate change that can be scaled and replicated across the world.
- Lastly, the program has continuously strengthening collaboration across government agencies, non-profits and private partnerships to support vulnerable communities in building capacity and leadership.

Image 1. Project Logic Model

Activities and Strategies	Outputs and Outcomes	Performance Measures
<p>1a. Identify and Strengthen Relationships with Stakeholders</p> <p>1b. Complete an IMS</p> <p>1c. IMS Communication Plan</p> <p>2a. IMS Evaluation Plan</p>	<p>C. Old and new stakeholders identified</p> <p>A. Methodology for implementation identified</p> <p>F. Increase in readiness to communicate IMS</p> <p>B. Local data identified and acquired</p> <p>H. Evaluation plan for IMS and each chosen intervention</p>	<p>Stakeholder list submitted with IMS.</p> <p>IMS w/complete list of stakeholders, team roster, list and description of interventions, and implementation and monitoring methodology, and timeline</p> <p>IMS communication plan w/ community representatives, vulnerable populations, stakeholders, communication activities, materials, and timeline</p> <p>IMS evaluation plan w/logic model, roster, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology.</p>
<p>2a. IMS Evaluation Plan</p> <p>1d. Communicate IMS</p> <p>2b. Implement IMS</p> <p>2c. Evaluate IMS</p>	<p>B. Local data identified and acquired</p> <p>G. IMS effectively tailored and delivered to relevant audiences</p> <p>I. Interventions and adaptations implemented</p> <p>J. Evaluation findings on IMS and chosen interventions</p> <p>H. Evaluation plan for IMS and each chosen intervention</p> <p>(ST B) Communication about IMS among key stakeholders</p> <p>(TT 1) Increase in # of actions to protect public</p> <p>(TT C) Increased capacity to address climate challenges</p>	<p>IMS evaluation plan w/logic model, roster, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology.</p> <p>Detailed list of communication, including stakeholders, materials, types of communication, and number of events.</p> <p>List of actions and/or interventions implemented by stakeholders.</p> <p>List of data collection status, including communication with evaluation stakeholders.</p> <p>Surveys and interviews with stakeholders that indicate climate health is being integrated into programmatic activities</p>
<p>2d. Review and Incorporate Evaluation Findings</p>	<p>K. Updated IMS w/evaluation findings</p> <p>(TT A) Public health integrated into climate change policy</p> <p>(TT D) Enhanced evidence-base on intervention efficacy</p>	<p>List of articles submitted and accepted into peer-reviewed journals.</p>
<p>Year 3 - 5</p>		
<p>2b. Implement IMS</p> <p>2c. Evaluate IMS</p>	<p>I. Interventions and adaptations implemented</p> <p>J. Evaluation findings on IMS and chosen interventions</p>	<p>List of actions and/or interventions implemented by stakeholders.</p> <p>List of data collection status, including communication with evaluation stakeholders.</p> <p>Surveys and interviews with stakeholders that indicate climate health is being integrated into programmatic activities</p>
<p>Year 2</p>		
<p>2a. IMS Evaluation Plan</p> <p>1d. Communicate IMS</p> <p>2b. Implement IMS</p> <p>2c. Evaluate IMS</p>	<p>B. Local data identified and acquired</p> <p>G. IMS effectively tailored and delivered to relevant audiences</p> <p>I. Interventions and adaptations implemented</p> <p>J. Evaluation findings on IMS and chosen interventions</p> <p>H. Evaluation plan for IMS and each chosen intervention</p> <p>(ST B) Communication about IMS among key stakeholders</p> <p>(TT 1) Increase in # of actions to protect public</p> <p>(TT C) Increased capacity to address climate challenges</p>	<p>IMS evaluation plan w/logic model, roster, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology.</p> <p>Detailed list of communication, including stakeholders, materials, types of communication, and number of events.</p> <p>List of actions and/or interventions implemented by stakeholders.</p> <p>List of data collection status, including communication with evaluation stakeholders.</p> <p>Surveys and interviews with stakeholders that indicate climate health is being integrated into programmatic activities</p>
<p>Year 1</p>		
<p>1a. Identify and Strengthen Relationships with Stakeholders</p> <p>1b. Complete an IMS</p> <p>1c. IMS Communication Plan</p> <p>2a. IMS Evaluation Plan</p>	<p>C. Old and new stakeholders identified</p> <p>A. Methodology for implementation identified</p> <p>F. Increase in readiness to communicate IMS</p> <p>B. Local data identified and acquired</p> <p>H. Evaluation plan for IMS and each chosen intervention</p>	<p>Stakeholder list submitted with IMS.</p> <p>IMS w/complete list of stakeholders, team roster, list and description of interventions, and implementation and monitoring methodology, and timeline</p> <p>IMS communication plan w/ community representatives, vulnerable populations, stakeholders, communication activities, materials, and timeline</p> <p>IMS evaluation plan w/logic model, roster, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology.</p>
<p>ST = Short Term Outcome, IT = Intermediate Term Outcome</p>		

Approach

Purpose

The mission of the SFDPH's Climate and Health Program is to address the public health consequences of climate change and its implications on human health. Over the last six years, by operationalizing the BRACE framework, SFDPH has successfully assessed climate trends, defined disease burden, evaluated effects of change for vulnerable populations, and proposed interventions. The Program has focused on preparing SFDPH to respond to the threat of climate change-related hazard events, and to ensure the equitable distribution of all climate health interventions. The purpose of this cooperative agreement is to work with City and community stakeholders to plan, implement, monitor, evaluate, and continuously improve climate and health interventions as identified in the SFDPH Climate and Health Adaptation Plan. This initiative will implement a Climate and Health Adaptation and Monitoring Program (CHAMP) for San Francisco through engaging stakeholders in climate resilience and working with vulnerable populations. The goal will be to reduce the health burden of climate change and increase health equity.

Outcomes

The operationalization of the CHAMP framework, which involves the development of an Implementation and Monitoring Strategy (IMS), will allow the Climate and Health Program to achieve short-, intermediate-, and long-term outcomes to address the public health consequences of climate change and its implications of human health. The outcomes include engaging stakeholders to develop capacity to plan, implement, monitor, evaluate, and improve interventions, increasing engagement to vulnerable communities to further solidify climate change as an acute public health threat, and to develop interventions that protect the public against the health impacts of climate change at the neighborhood and city level, with a focus on health equity. These outputs and outcomes are referenced in detail in the logic model on page 3. Outputs and outcomes are referenced again in the work plan on page 17 with specific, measurable, achievable, relevant, and time-phased objectives.

Strategies and Activities

The following strategies have been identified in the logic model on page 3. These eight main strategies and activities will help us develop, communicate, evaluate, and improve our IMS and chosen interventions. We have divided the strategies into two sections: planning and communication strategies, and implementation and evaluation strategies. Each strategy will be attached to an expected timeframe for development, and each strategy description will include performance measures that we will use to evaluate the strategy.

Planning and Communication Strategies

Strategy 1a: Identify and strengthen relationships with stakeholders (Year 1)

Our work would not be possible without engaged partners and collaboration with a diverse set of stakeholders. SFDPH has a long history of collaborating with local, state, and federal public agencies, and community organizations. Over the last grant cycle, the Climate and Health Program focused on growing partnerships on a local and regional level. We have continued to

seek guidance and partner with climate experts with key agencies that oversee infrastructure, transportation, as well as planning and emergency management. Over the last several years, the City of San Francisco has elevated efforts to build climate resilience by hiring both a Chief Resilience Officer as part of the Rockefeller Foundation's 100 Resilient Cities Challenge and a Senior Advisor on the Environment to the Mayor's Office which has elevated the efforts of the Climate and Health Program. We will develop a list of stakeholders with the development of the IMS within the first year of the project period. Over the next five years, we expect to increase engagement with City stakeholders to coordinate climate change research, collaboratively plan interventions, and use our collective capacity to expand the coverage and depth of our outreach. We will work with neighborhood groups and residents to develop community-driven interventions and trainings including partnering with the San Francisco Office of Resiliency and Recovery to lead community meetings at 29 public libraries beginning in mid-2016 to promote climate health education and engage stakeholders in climate adaptation.

Strategy 1a: Performance Measure: IMS developed within the year of the project period with a complete list of state, regional, and local stakeholders.

Strategy 1b: Develop an IMS (Year 2)

By the end of the first year of the project period, the Climate and Health Program will develop an Integrated Monitoring Strategy (IMS). The IMS is part of the Climate and Health Adaptation and Monitoring Program (CHAMP) framework and will detail the methodologies necessary to implement, monitor, and improve interventions. The IMS will include a team roster to oversee the IMS, a list of interventions with target populations and geographic neighborhood, a thorough list of stakeholders, and methodology for intervention implementation, monitoring process and impact, a timeline of activities. The IMS will also define intervention evaluation criteria, including identifying measurable impacts and new data sources.

Strategy 1b: Performance Measure: By the end of the first year of the project period, we will have a completed IMS with a list of state, regional, and local stakeholders, a team roster including roles and facilitators, a list and description of chosen interventions including site locations, intervention implementation and monitoring methodology including necessary resources, and a timeline and milestones for each intervention.

Strategy 1c: IMS Communication Plan (Year 1)

Communication tools and the participation of local residents and policy makers are critical to the success of this program. In the last grant cycle, we created a communication plan that focused on understanding Climate and Health coverage in the media, and suggested key messages, credible messengers, and outlined a successful climate change communications strategy. During the last project period, communication materials included online surveys, Live Stories online communication platform, press releases, interactive maps, a comprehensive climate and health website, and a two day climate and health workshop for local practitioners.

The Climate and Health Program will develop an IMS Communication Plan in conjunction with the development of the IMS. This plan will leverage our existing Climate and Health Profile Communication Plan. The IMS Communication plan will include the thorough list of stakeholders developed during the creation of the IMS, as well as smaller intervention-specific

stakeholder groups, detailed communication methods including communication type, communication schedule, and a communication evaluation plan which will include methodology to track and continuously evaluate the effectiveness of outreach and communication of IMS to stakeholder agencies. We will include workgroups, workshops, presentations and reports as standard methods of communication and will leverage partnerships for new and innovative ways of communicate. We have already solidified two partnerships for the IMS communication Plan. We will partner with the San Francisco Office of Resiliency and Recovery to co-lead community meetings at 29 public libraries beginning in later 2016 to promote our Climate and Health Adaptation Plan and engage stakeholders in climate adaptation. We have also partnered with FEMA and Climate Access to place two OWL units (a 360-degree audio-visual platform that enables users to respond to survey questions and leave audio comments) in San Francisco to showcase sea level rise projections, and potential responses to those impacts. Following these partnerships, we hope to demonstrate how a handful of evidence-based best practices in climate health communication and engagement can be used to build climate policy support for interventions at the local and regional area. These best practices will include making the issue tangible, increasing risk perception, showcasing positive solutions, and using dialogue to break down ideological polarization.

Strategy 1c: Performance measures: A complete communication plan including number and name of community representatives, number and names of vulnerable populations, number of stakeholders, number of communication activities, number and type of communication materials, and communication and dissemination dates.

Strategy 1d: Communicate IMS (Year 2)

The actual communication of the IMS will incorporate the methodology as outlined in the IMS Communication Plan. The implementation of the IMS communication plan will coincide with the evaluation of communication. The execution of a successful communication strategy will result in the IMS being effectively tailored and delivered to the relevant audiences, increased communication among IMS stakeholders, and vulnerable communities increasing awareness of climate change risks. Although the communication of the IMS will begin in Year 1, it will be continuously evaluated and updated through the lifespan of the project cycle.

Strategy 1d Performance measures: The performance measures will be established in the IMS communication plan and may include a list of key stakeholders, a number and description of communication material, vulnerable populations engaged, key timelines and milestones, and stakeholder surveys.

Implementation and Evaluation Strategies

Strategy 2a: IMS Evaluation Plan (Year 1 and Year 2)

The SFDPH Climate and Health Program will develop a comprehensive evaluation work plan that will measure short-term process outcomes and project goals, as well as long-term project goals. Through our evaluation efforts, we aim to successfully meet all the short and long term objectives of the IMS and selected interventions and have the data to continuously improve and strengthen interventions, communication, and engagement. Evaluation will both allow us to better protect and build community resiliency, as well as enhance the evidence base on

intervention efficacy. Project staff included on this grant have backgrounds in program evaluation and specific training in quality improvement and performance management for public health.

Strategy 2a Performance measures: Beginning in Year 1, and to be completed by Year 2, the SFDPH Climate and Health Team Evaluator will develop an IMS evaluation plan with logic model, roster of stakeholders, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology including data sources.

Strategy 2b: Implement IMS and chosen interventions and adaptations (Year 2 +>)

The SFDPH Climate and Health Program has already begun meaningful action to combat climate and health impacts of climate change. These actions have included working internally at SFDPH and with the Department of Emergency Management to develop climate hazard annexes to emergency management plans, and developing outreach and engagement materials to present to vulnerable populations. We will build upon this work with the development of the IMS, the IMS Communication Plan, and the IMS Evaluation Plan to allow for the seamless implementation of the IMS and interventions identified in the SFDPH Climate Adaptation Plan. Interventions will be implemented by the SFDPH Climate and Health Team in conjunction with state, local, and neighborhood stakeholders as identified in the IMS.

Strategy 2b: Performance measures: Beginning in Year 2 of the project period, the Climate and Health Program will begin implementing interventions as established in the IMS and Climate Adaptation Plan. Performance measures may include a list of actions and interventions implemented by SFDPH or stakeholders, and an updated IMS with intervention milestones shown as complete.

Strategy 2c: Evaluate the IMS and chosen interventions (Year 2 +>)

Through our evaluation efforts, SFDPH aims to ensure that we successfully meet all the short-, intermediate-, and long-term objectives of the grant by adhering to project deadlines and engaging in a process of quality improvement. The Program will operationalize the IMS evaluation methodology as developed in year 2 of the project timeline in conjunction with the implementation of the interventions. The evaluation of the IMS and chosen interventions will measure intervention effectiveness, and help the Climate and Health Team improve interventions to maximize impact. The evaluation will also allow stakeholders to provide feedback into IMS processes. The IMS Evaluation Plan will have already established stakeholders, data sources, and timelines, and routine engagement will ensure evaluation questions are sufficient and objectives are clearly communicated.

Strategy 2c: Performance measure: Performance measures may include a list of intervention and data collection status, including a list of communication with evaluation stakeholders, and surveys and interviews with stakeholders that indicate climate health is being integrated into programmatic activity.

Strategy 2d: Review evaluation results with key stakeholders and incorporate findings into the IMS and chosen interventions to improve and update (Year 3 +>).

Because climate change is a long term threat, interventions to protect the City from new and enhanced climate change-related health outcomes must be similarly long term. To ensure the

success of these interventions, the Climate and Health Program is prepared to engage on a continuous effort to evaluate and improve interventions. Each intervention will have a steering committee and the committee will be engaged in the evaluation and performance measurement process by helping review the full evaluation and performance measurement plan, and helping complete evaluation activities. The final outcome will be a systematic process to communicating, evaluating, and improving interventions to protect public health and promote resiliency. This system will successfully build capacity within the city and the community to address challenges posed by climate change, cement evaluation methodology and promote a culture of continuous improvement while engaging the public.

Strategy 2d Performance measures: Performance measures for this strategy include data an updated IMS documenting changes to IMS interventions based on evaluation findings, a list of changes to internal policies that reflect a climate health lens, as well as programs that have included climate health considerations into policy or program activities, and a list of articles submitted and accepted into peer-reviewed journals.

Collaborations

The identification of and engagement with a diverse set of stakeholders will be instrumental in creating and implementing CHAMP and the IMS for San Francisco. The Climate and Health Program has developed an extensive network of stakeholders and partners, working closely with many state, regional, local, and community organizations. Refer to Table 1 on page 10 for a complete list of existing key partners and descriptions of the relationships. Within the next year, the program will be working more extensively within SFDPH, including with the Health Delivery Network to design interventions that ensure the continuation of activities in the event of enhanced or emerging climate health threats. The program will continue to work with neighborhood groups to develop community-driven interventions and trainings. Statewide, the Climate and Health Program has worked closely with the California Department of Public Health, and the Governor's Office of Planning and Research. The program has leveraged its partnership with the USGBC's Building Health Initiative, Public Health Institute, Climate Readiness Institute and BARHII to engage with academics and policymakers around regional climate adaptation issues. The program has leaned on Federal departments, such as the CDC, NOAA, EPA, and USGS for climate science and best practices. Within the last two years, the Climate and Health Program expanded its Federal Partnerships to work with the U.S White House – Office of Science and Technology. For this new cooperative agreement, the San Francisco Climate and Health Program will also work more closely with New York City

Department of Health and Mental Hygiene, as they are the only other City to receive funding for Climate and Health from the CDC. Within San Francisco, the Climate and Health Program has joined the Mayor's Task Force on Sea Level Rise and also the Program Director has joined the City's Directors Working Group, which is tasked with advising the Mayor and Head Directors on issues such as climate change adaptation. The Climate and Health Team is also part of several other City working groups including the Solar Market Pathways Solar + Storage for Resilience

Table 1: List of Stakeholders		
Department/Organization	Type	Nature of Collaboration
SF Office of Resilience and Recovery	City Agency	communications, outreach, policy, performance goals and metrics
SF Planning Department	City Agency	Sea Level Rise and adaptation, planning and development
SF Environment	City Agency	communications, outreach, policy
SF Public Utility Commission	City Agency	Scientific Research, Sea Level Rise, inland flooding
SF Human Service Agency	City Agency	Sheltering
SF Dept. of Emergency Management	City Agency	communications, outreach, emergency response
Bay Area Health Inequities Initiative (BARHII)	Regional Non-profit	Regional Policy, Best Practices, communication and outreach
USGBC – Northern California	Regional Non-profit	Regional Policy, Best Practices, communication and outreach
CA Dept. of Public Health	State Agency	State Partnership, tool kits, best practices
State Governor’s Office	State Agency	State Partnership, tool kits, best practices
US White House – Office of Science and Technology	Federal Agency	Federal Partnership, tool kits, best practices
Climate Readiness Institute	Non-profit	Scientific Research, Academic Partnerships
Public Health Institute	Non-profit	Regional Policy, Best Practices, Communications
New York City Department of Health and Mental Hygiene	National Partner	Case Studies, Best Practices, Communications

project and The Neighborhood Empowerment Network and multiple active transportation work groups, which are all aimed at increasing community resilience. During the last year, the Climate and Health program has developed new relationships within the San Francisco Public Utility Commission to collaboratively address climate change, waterborne illness, impacts of dampness/mold, drinking water contamination, and the health impacts of a combined stormwater/wastewater sewer system during heavy precipitation events.

The Climate and Health Program will continue to seek new innovative public-private partnerships to advance climate resilience. During the last several years, the program has worked with Appalicious to help create the *The Disaster Assessment and Assistance Dashboard* (DAAD) to assess community resiliency and promote economic recovery in the wake of a disaster. We have worked with Four Twenty Seven to provide health expertise on local tools and to create interactive maps on flood health vulnerabilities and we have worked with LiveStories, an online communication platform to communicate health impacts of flooding.

Target Populations

Over the previous grant cycle, the Climate and Health Program has identified target populations vulnerable to the health impacts of climate change and climate change-related hazard events in San Francisco. Factors that modify the health impact of climate change-related health impacts

include environmental exposure, housing quality, socioeconomic and demographic status, and pre-existing health conditions. Through operationalization of the Community Resiliency Indicator System, we identified 38 indicators that either increased or decreased a residents' resiliency to climate hazard events. Indicators were determined through an interdepartmental workgroup of climate and community resiliency experts. The final indicators were combined to create a resiliency score. Socioeconomic indicators include age, income, race, level of educational attainment, and language. Infrastructure and built environment indicators include housing quality, impervious surface, and proximity to transportation. Pre-existing health indicators include asthma rates, mental health conditions, and diabetes rates.

We intend to focus our interventions to target those with the highest vulnerability to these climate health stressors. Areas with the highest concentrations of these target populations include the following San Francisco Neighborhoods - Bayview Hunters Point, Visitacion Valley, Crocker Amazon, Treasure Island, South of Market, Downtown/Tenderloin and Chinatown. Because many vulnerable populations speak Mandarin, Cantonese, Spanish, and other non-English languages we will ensure our communication materials are translated whenever necessary to reach our target audiences. When we do not have capacity to reach a target population, we will partner with local non-profits and regional agencies to expand our reach.

Methods to effectively communicate and tailor IMS interventions to vulnerable populations will include outreach and recruitment of stakeholders from these communities to participate in the IMS development and implementation process, including members of local community-based organizations, and outreach and engagement specialists. We expect to develop an IMS Communication Plan in the first year of the project period that will guide the communication and dissemination of the IMS, interventions, and evaluation.

Application Evaluation and Performance Measurement Plan

The Climate and Health Program aims to ensure that we successfully meet all the short-, intermediate-, and long-term objectives, outputs, and outcomes of the grant. Our evaluation efforts will help ensure we meet project deadlines, effectively communicate and engage with stakeholders, and reach our desired project outputs and outcomes. As the Climate and Health Program intends to build upon the work of the last grant period, by evaluating and monitoring project processes and outcomes, we will be better able to successfully maintain and build community resiliency in San Francisco. Additionally, our evaluation efforts will provide insight into how our activities can be improved upon, which will serve as a model for other cities and municipalities seeking to build their community resiliency and capacity to respond to climate change.

We've built the Evaluation and Performance Measurement Plan around the outputs and outcomes as identified in our logic model on page 3. Each evaluative output and outcome is included in Table 2 on page 11, with type of evaluation, performance measures, evaluation questions, indicators, data sources, and responsible parties. A full Evaluation and Performance Measurement Plan will be finalized within the first 6 months of the project period.

Table 2: Evaluation and Performance Measurement

Eval. Type	Performance Measure	Evaluation Question(s)	Indicators	Evaluation Criteria	Staff Involved
Process	Output A: Methodology for implementation identified	<ol style="list-style-type: none"> 1. Did the program identify methods for each intervention? / Which interventions do not have methodologies? 2. What barriers did we encounter while completing this step? / How could we improve this process? 	Process report that identifies methodologies	In the Completed IMS, do all interventions have methodologies for implementation?	Climate and Health Program Manager
Process	Output B: Local data identified and acquired	<ol style="list-style-type: none"> 1. Did the program identify enough data sources? / Do our data sources provide enough information to evaluate interventions? 2. What barriers did we encounter completing this step? / How could we improve this process? 	Process report that identifies data sources	In the Completed IMS, do all interventions have data sources?	Climate and Health Program Data Analyst
Process	Output C: Old and new stakeholders identified	<ol style="list-style-type: none"> 1. Did the program identify stakeholders necessary to implement and evaluate interventions? 2. Have the stakeholders been engaged in the IMS development process? 3. What barriers did we encounter completing this step? / How could we improve this process? 	List of old and new stakeholders	In the Completed IMS, are stakeholders identified sufficient to effectively implement and evaluation interventions?	Climate and Health Program Manager
Process	Output D: Increase in organization of agency and partnership work.	<ol style="list-style-type: none"> 1. Does our team roster account for all roles necessary to implement and evaluate IMS? 2. Does each facilitator understand their role and how it relates to the IMS? 3. What barriers did we encounter completing this step? / How could we improve this process? 	IMS team roster, facilitators	In the Completed IMS, is the IMS team Roster and Facilitators account for all roles necessary to implement IMS?	Climate and Health Team
Process	Output E: Increase in	<ol style="list-style-type: none"> 1. Does the IMS include all necessary components (a list of state, regional, and local stakeholders, a team roster including roles and facilitators, a 	Completed IMS with all necessary components	Is the IMS complete?	Climate and Health Team

	readiness to implement IMS	list and description of chosen interventions including site locations, intervention implementation and monitoring methodology, and a timeline and milestones)? 2. What barriers did we encounter completing this step? / How could we improve this process?			
Process	Output F: Increase readiness of agency to effectively communicate IMS	1. Did the program identify representatives from all vulnerable populations? 2. Did we develop a plan that allows for sufficient engagement with stakeholders? / Are stakeholders satisfied with their involvement? 3. Do the communication materials; A) meet the requirements of the Paperwork Reduction Act; B) effectively address interventions planned? 4. Are dates identified for communication / dissemination? 5. What barriers did we encounter completing this step? / How could we improve this process?	Report with number and name of community representatives, vulnerable populations, stakeholders, communication activities, communication materials and dates	In the Completed IMS Communication Plan, have vulnerable populations and community stakeholders been identified? Are the communication activities sufficient to ensure effective implementation of IMS interventions?	Climate and Health Program Educator
Process	Output G: IMS effectively tailored and delivered to relevant audiences	1. Has IMS communication and dissemination strategy successfully delivered IMS to relevant stakeholders? If not, which interventions and which communities need support? 2. What barriers did we encounter completing this step? / How could we improve this process?	List of key stakeholders including vulnerable populations in updated communication strategy, number and description of communication materials	Has the stakeholder engagement been sufficient to increase awareness of the IMS and chosen interventions?	Climate and Health Program Educator
Process	Output H: Evaluation plan for IMS and each	1. Is the evaluation plan sufficient to monitor and improve interventions?	Report with number of data sources, location of	In the Completed IMS Evaluation Plan, do all interventions have	Climate and Health Program

	chosen intervention	2. What barriers did we encounter completing this step? / How could we improve this process?	data sources, methodology	data collection and performance measures attached?	Data Analyst
Process	Output I: Interventions and adaptations implemented	1. Which interventions been implemented? 2. What barriers did we encounter completing this step? / How could we improve this process?	Report with number of actions taken and/or interventions implemented by stakeholders	Are the milestones established in the IMS being met?	Climate and Health Team
Process	Outputs J and K: Evaluation of interventions, and incorporation of evaluation findings in new IMS	1. Are the interventions being successfully evaluated? 2. Is evaluation methodology sufficient to develop findings? 3. Have findings been successfully incorporated to strengthen interventions? 4. What barriers did we encounter completing this step? / How could we improve this process?	Report with data sources, number of modifications to IMS and interventions.	After the IMS has been updated, which interventions have been modified and which haven't? Which interventions are being evaluated sufficiently and which are not?	Climate and Health Program Data Analyst
Outcome	Short term outcome B: Awareness of, and communication about, the IMS among key stakeholders, public.	1. Are stakeholders aware of IMS and interventions, including IMS goals and objectives?	Tracked list of IMS-related communications including communication type, events, and methods.	Has the communications established in the IMS Communication Plan been effective? Are we meeting our milestones?	Stakeholders, Climate and Health Program Educator, Community Leaders
Outcome	Short term outcome C: Vulnerable communities aware of climate change risk and resources to help	1. Are vulnerable communities aware of the risk of climate change and resources available? Have they become more aware?	Answers from a stakeholder survey	Percentage of community reporting climate change as a significant risk; Increase in knowledge of resources available	Climate and Health Program Data Analyst

Outcome	Short term outcome I: Increase the number of actions taken by grantee and partners to protect the public climate change	1. Has the program or project partners, through the IMS process, increased the number of actions taken to protect the public?	Report with number of actions taken, type of actions	Is there any correlation between interventions implemented and an increase in climate actions?	Climate and Health Program Team Stakeholders
Outcome	Intermediate term outcome A: Public health considerations integrated into state/local policy	1. Has the IMS lead to changes in state and local policy?	Tracked list of policies integrated into the SF Municipal Code.	Is there any correlation between interventions implemented and an increase in climate health policy?	Climate and Health Program Team, Stakeholders
Outcome	Intermediate term outcome C: Increased capacity to address challenges posed by climate change.	1. Are stakeholders integrating climate change considerations into their work? 2. Has this project increased capacity to address climate challenges?	Report with number of local programs integrated a climate health lens into programs, Number of SFDPH managers incorporating climate change into programs	Using interviews and stakeholder surveys, has the Program increased the integration of climate change into programmatic activities?	Climate and Health Data Analyst, SFDPH Managers
Outcome	Intermediate term outcome D: Enhanced evidence base on intervention efficacy	1. Has the Program interventions improved knowledge-base? 2. Are SFDPH successes replicable to other jurisdictions?	Report with number of improvements to IMS interventions, tracked list of scholarly articles	Have interventions improved and added to the evidence base to make interventions replicable in other jurisdictions?	Climate and Health Program Team

Organizational Capacity

The SFDPH Climate and Health Program has the capacity and extensive expertise to successfully carry out the proposed strategies and activities. Our capacity includes the following:

- A strong network of public health partners and stakeholders.
- Access to existing data on relevant environmental, social, and health indicators; including data sharing agreements where the custodian of relevant data resides outside of the awarded agency.
- Capacity to analyze and synthesize the health and at-risk population data in order to identify appropriate interventional activities.
- Capacity to develop and implement drought-related interventional activities, including staff members with appropriate experience and sufficient, dedicated staff time.
- Capacity for program planning, monitoring, and evaluation; financial reporting; budget management and administration; and personnel management including delineation of staff roles and expertise.
- Capacity to manage required procurement efforts, including the ability to write and award contracts in accordance with application regulations.

The San Francisco Department of Public Health – Office of Policy and Planning (SFDPH-OPP) will be the lead coordinating agency with responsibility for this project. SFDPH is a demonstrated leader in public health and climate change issues. SFDPH successfully created the Climate and Health Program with the support from the CDC in the first and second cohort of funding through the Climate-Ready States & Cities Initiative and BRACE Initiative. Through this process, the program engaged community partners to develop a comprehensive approach to understanding community vulnerability to climate change and creating interventions that will target communities and populations at highest risk for illness in order to advance urban health, social and environmental justice.

The San Francisco Department of Public Health Project Lead is Cyndy Comerford, Manager of Planning, Policy, and Analysis in the Office of Policy and Planning. She will serve as the primary contact for this grant and will have grant administrative responsibilities related to the budget and development of sub-contracts and related scopes of work. Since 2010, she has been the principal investigator of the CDC Climate Ready States and Cities Initiative and led the development of the San Francisco Climate and Health Program. She has led a multi-disciplinary team with expertise in biostatistics, emergency disaster response, emergency medical services, environmental epidemiology, atmospheric science, indicator development, and climatology. Cyndy will provide project oversight, strategic guidance, and coordinate collaboration with local and regional public agencies. She also is responsible for the research design, data analysis, environmental assessment and statistical analysis portion of this project. She holds a Master's Degree in Environmental Policy and Planning and has comprehensive experience planning and developing public health programs and providing technical assistance to incorporate public health considerations into federal, state and local planning decisions. The Climate and Health Team will support this initiative with the following existing staff:

- Matt Wolff, Health Data Analyst, will perform highly technical aspects of the project related to the analysis of health data and geographical information systems. This includes acquiring, organizing, editing, analyzing, and visualizing data through maps, charts, and graphs for the vulnerability assessment, drafting a plan of activities and strategies to prevent and mitigate health effects of drought, project evaluation and design of interventions.
- Tara Connor, Education and Outreach Coordinator, will research and develop outreach materials (e.g. presentations, fact sheets, social media) to reach target audiences as defined by the program’s goals and objectives.
- Teri Dowling, Community Engagement, Planning and Special Projects Manager, will serve as the Coordinator for the Public Health Emergency Preparedness & Response Team. She will play a key role on the maintaining the work plan for the team and will direct the community engagement piece.
- Naveena Bobba will serve to support and provide guidance for the grant in matters relating to public health emergency preparedness. Her section will work with partners to develop plans that integrate with local, state and federal agencies efforts.

SFDPH, as a large department of the City and County of San Francisco (CCSF), has its own grants fiscal unit, information technology support staff, human resources unit and contract staff, which will provide administrative support to this project. The San Francisco Public Health Foundation (SFPHF) will serve as a fiscal intermediary to hire staff and consultants for the cooperative agreement. SFPHF has previous experience working with SFDPH and the City and County of San Francisco. The services provided SFPHF will include:

- A Communication Specialist that will assist with the development of the communications strategy. This information will be deployed through multiple venues and media to share information we develop in the course of this project. The Communication Specialist will also create a social media networking site using our existing web resources.
- An Evaluation Specialist to review our evaluation design, evaluation data collection, and analysis of evaluation data for evaluation of process and impacts and recommendations for process improvement.
- Through a consulting services contract, a graphic designer will provide services to design our reports for the public.

Work Plan

We will use the CHAMP and IMS framework for our program planning. Project tasks correspond to strategies, as detailed in the Strategy and Activities section of this application. We have submitted a detailed work plan for the first year of the project, and have included goals and objectives for the following four years. All of the major project strategies and activities have been documented with an estimated timeline on Table 3 below.

Strategies and Activities

Table 3. Work Plan Year 1

Project Time Line				
Project Strategies and Activities	Year 1			
	Q1	Q2	Q3	Q4
1. Finalize Project Evaluation and Performance Management Plan				
A. Identify and outreach to stakeholders	X	X	X	X
B. Finalize strategy-specific evaluation questions	X			
C. Develop performance measures	X			
D. Identify data and develop data collection plan	X			
E. Finalize project dissemination plan		X		
F. Write and submit plan		X		
1a. Identify and Strengthen Relationships with Stakeholders				
A. Outreach to stakeholders	X	X	X	X
B. Scope to develop robust stakeholder list	X			
C. Develop stakeholder engagement survey	X	X		
D. Send stakeholder survey		X		
E. Refine stakeholder list		X		
1b. Develop an IMS				
A. Outreach to stakeholders	X	X	X	X
B. Finalize selection of interventions	X	X	X	
C. Develop IMS team roster	X	X	X	
D. Review list of vulnerable populations	X	X	X	
E. Identify data sources and measurements		X	X	
F. Finalize project dissemination plan		X	X	
G. Write IMS			X	X

Project Strategies and Activities	Year 1			
	Q1	Q2	Q3	Q4
1c. Complete an IMS Communication Plan				
A. Outreach to stakeholders	X	X	X	X
B. Incorporate analysis from stakeholder engagement survey			X	
C. Write communication plan			X	X
D. Articulate communication plan to stakeholders				X
2a. Develop IMS Evaluation Plan				
A. Outreach to stakeholders	X	X	X	X
B. Develop protocol to track communications			X	
C. Identify intervention-specific evaluation questions			X	X
D. Identify intervention-specific data sources				X
E. Organize intervention-specific evaluation meetings				
F. Write plan				
1d. Communicate IMS	Year 2			
2b. Implement IMS	Year 2 - 5			
2c. Evaluate IMS	Year 2 - 5			
2d. Review and Incorporate Evaluation Findings	Year 3 - 5			

Outputs and Outcomes

Based on the project work plan documented in Table 2, the objectives, outcomes, and deliverables (milestones for accomplishing the objectives) for the first year of the project period are detailed below. The objectives, outcomes, and deliverables are in line with the project strategies outlined in the project narrative. Many of the objectives, outcomes, and deliverables can also be found in the logic model on page 3, and in the applicant evaluation and performance measurement plan on page 10. These objectives, outcomes, and deliverables have been expanded in this section to align with the SMART criteria: specific, measurable, achievable, relevant, and time-bound. Many strategies and activities may have multiple outcomes and outputs, and outcomes and outputs may be linked to multiple strategies and activities. In the interest of space, we have simplified to include each outcome and output only once, associated with the most relevant strategy and activity.

Short-term outcomes are abbreviated as (ST), intermediate-term as (IT), and long-term as (LT). Funding from the CDC is essential to achieving success for this work plan.

Strategy 1a: Identify and Strengthen Relationship with Stakeholders

Outputs / Outcomes: Output C: Increase the number of project stakeholders, by identifying new stakeholders and engaging old stakeholders, to sufficiently plan and implement interventions as established in the IMS.

Performance Measures: Have new stakeholders been identified?

Deliverables: Completed IMS with intervention stakeholders identified, Comprehensive evaluation and performance management plan.

Timeframe: Year 1

Strategy 1b: Complete an IMS

Outputs / Outcomes: Output A: Develop methodology for the implementation of chosen interventions. Output D: Increase organization of agency and partnership work. Output E: Increase readiness to implement IMS.

Performance Measures: Has an IMS been completed? Are the methodologies in this IMS sufficient to implement chosen interventions?

Deliverables: Completed IMS with a list of state, regional, and local stakeholders, a team roster including roles and facilitators, a list and description of chosen interventions including site locations, intervention implementation and monitoring methodology including necessary resources, and a timeline and milestones for each intervention.

Timeline: Year 1

Strategy 1c: Complete and IMS Communication Plan

Outputs / Outcomes: Output F: Increase readiness to communicate the IMS to stakeholders, community-members, and relevant populations.

Performance Measures: Are we ready to communicate the IMS?

Deliverables: A complete communication plan including number and name of community representatives, number and names of vulnerable populations, number of stakeholders, number of communication activities, number and type of communication materials, and communication and dissemination dates.

Timeline: Year 1

Strategy 2a: Develop IMS Evaluation Plan

Outputs / Outcomes: Output B: Acquire local data and identify data sources, necessary to implement and evaluate interventions. Output H: Design an evaluation plan for the IMS and each chosen intervention that identifies data sources, evaluation stakeholders, and intervention milestones.

Performance Measures: Has new data been acquired? Have data sources been identified? Are these data sources relevant to measure intervention milestones? Does each intervention have a corresponding evaluation plan? Is the evaluation plan sufficient to monitor and improve the intervention?

Deliverables: IMS evaluation plan with logic model, roster of stakeholders, timeline, intervention-specific evaluation questions, engagement strategy, and qualitative and quantitative methodology including data sources.

Timeline: Year 1 – Year 2

Planned Goals for Year 2 – 5

Planned strategies and activities, and associated outputs and outcomes from year 2 – 5 are summarized below. These can be found in more detail in the logic model on page 3 or in the Evaluation and Performance Management Plan on page 10.

‘Short-term’ is abbreviated ‘ST’ and ‘Intermediate-term’ is abbreviated as ‘IT’.

Year 2 Outputs and Outcomes

Strategy / Activity	Output / Outcome
IMS Evaluation Plan	Output B, Output H
Communicate IMS	Output G, ST Outcome B, ST Outcome C
Implement IMS	Output I, IT Outcome I
Evaluate IMS	Output J, IT Outcome C

Year 3 Outputs and Outcomes

Strategy/Activity	Output / Outcome
Implement IMS	Output I, IT Outcome I
Evaluate IMS	Output J, IT Outcome C
Review and Incorporate Evaluation Findings	Output K, IT Outcome A, IT Outcome D

Year 4 Outputs and Outcomes

Strategy/Activity	Output / Outcome
Implement IMS	Output I, ST Outcome I
Evaluate IMS	Output J, IT Outcome C
Review and Incorporate Evaluation Findings	Output K, IT Outcome A, IT Outcome D

Year 5 Outputs and Outcomes

Strategy/Activity	Output / Outcome
Implement IMS	Output I, ST Outcome I
Evaluate IMS	Output J, IT Outcome C
Review and Incorporate Evaluation Findings	Output K, IT Outcome A, IT Outcome D