

# Coupling Public Health with Climate Resilience



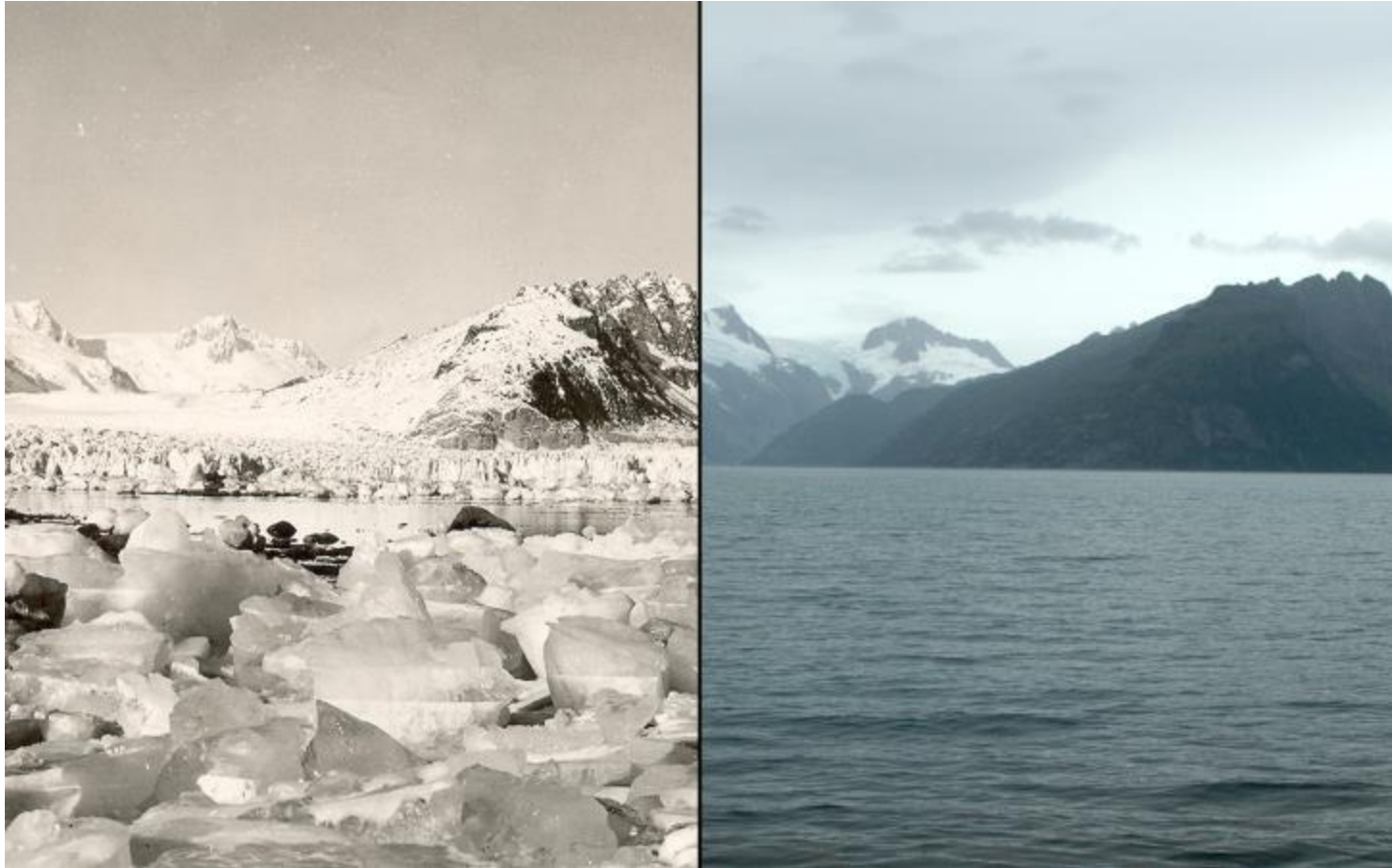
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City and County of San Francisco

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# Presentation Objectives

- Provide information about of the San Francisco Department of Public Health Climate and Health Program and City-Wide Initiatives
- Explain why it is important for Public Health professionals to know about climate change and the projected impacts of climate change on health.
- Learn about some of the past initiatives and highlights of the Climate and Health Program
- Learn about upcoming strategic activities





# Climate Change is Happening Now



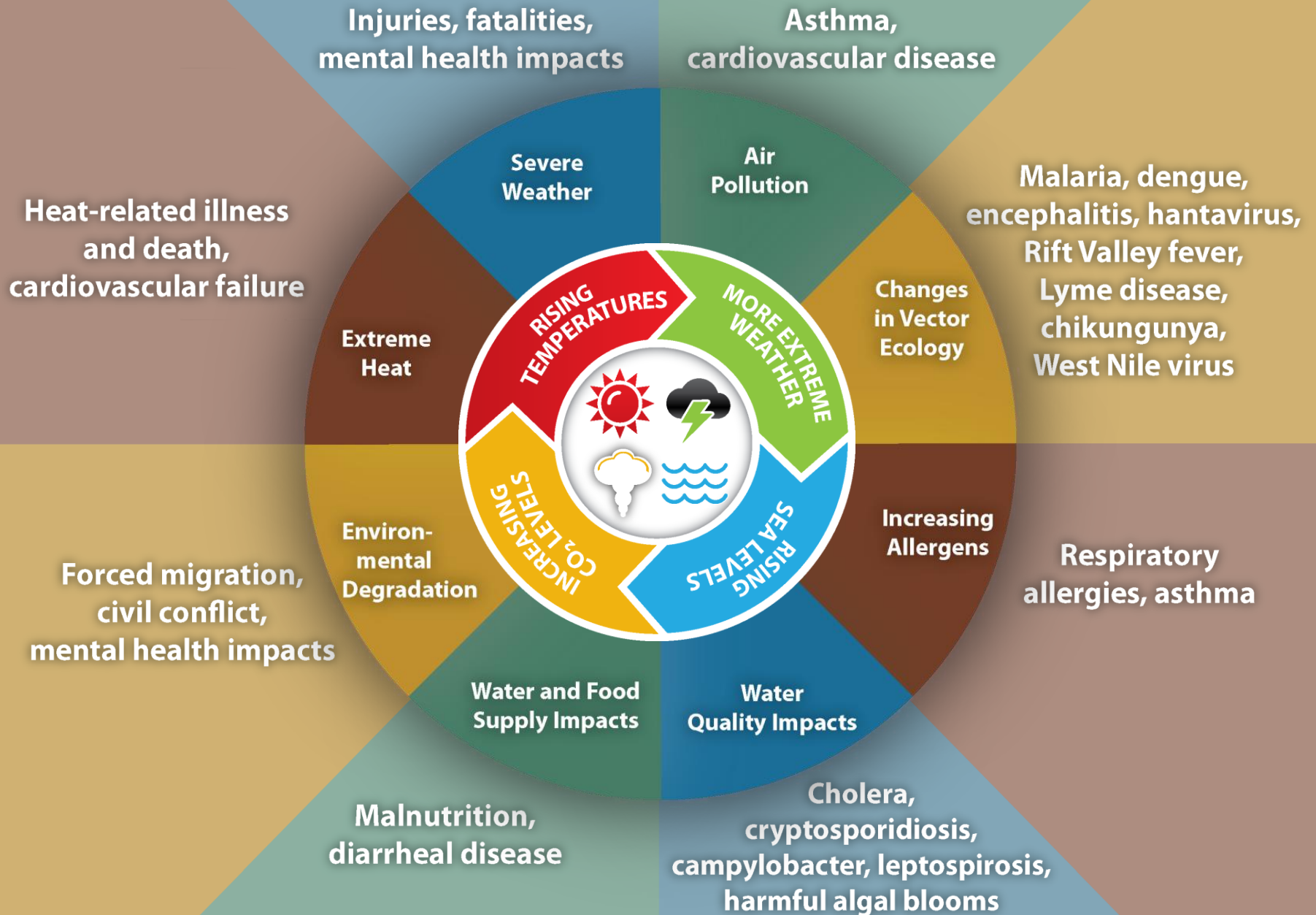
*Northwestern Glacier melt, Alaska from 1940 (left) to 2005 (right)*

# Climate Projections



HAZARD	CLIMATE IMPACT	HEALTH IMPACT
<p>Temperature </p>	<p>Average yearly temperature to increase between 4.1 and 6.2 degrees Fahrenheit by 2100</p> <p>Extreme Heat Days (over 85F) to increase by 15-40 by 2050, potentially 90 by 2100</p> <p>Increase in heat wave length and frequency.</p>	<ul style="list-style-type: none"> <li>- Heat-Related Illness                             <ul style="list-style-type: none"> <li>o Dehydration</li> <li>o Heat Stroke</li> </ul> </li> <li>- Heat-Related Mortality                             <ul style="list-style-type: none"> <li>o Heart Disease</li> </ul> </li> <li>- Air Quality Effects                             <ul style="list-style-type: none"> <li>o Respiratory Illness</li> <li>o Asthma</li> <li>o Allergies</li> </ul> </li> <li>- Mental and Behavioral Health</li> </ul>
<p>Sea level Rise </p>	<p>Projections indicate that in the most likely scenario, sea levels will rise between 7-15 inches by 2050 and 26-46 inches by 2100</p>	<ul style="list-style-type: none"> <li>- Fatal and Nonfatal Injury</li> <li>- Water-borne disease</li> <li>- Mental and Behavioral Stressors</li> <li>- Income Loss</li> </ul>
<p>Extreme Storms </p>	<p>Bay Area precipitation levels are projected to fluctuate between wet and dry extremes. Currently California receives 35% - 45% of its annual precipitation from 'Pineapple Express' extreme storm events. This number could increase by up to 11% by 2100.</p>	<ul style="list-style-type: none"> <li>- Fatal and Nonfatal Injury</li> <li>- Water-borne disease</li> <li>- Mental and Behavioral Stressors</li> <li>- Strain on public health infrastructure</li> <li>- Income Loss</li> </ul>
<p>Drought </p>	<p>Bay Area precipitation levels are projected to fluctuate between wet and dry extremes. In dry years where the high-pressure system off the coast does not dissipate, the frequency and severity of droughts will increase.</p>	<ul style="list-style-type: none"> <li>- Income Loss</li> <li>- Food Insecurity                             <ul style="list-style-type: none"> <li>o Malnutrition</li> </ul> </li> <li>- Air Quality / Allergens                             <ul style="list-style-type: none"> <li>o Respiratory Illness</li> <li>o Asthma</li> <li>o Allergies</li> </ul> </li> <li>- Mental and Behavioral Health</li> </ul>

# Impact of Climate Change on Human Health





# Climate Change Already Impacts Health

## Deaths from climate change

**≥ 150,000 deaths due to climate change occur each year**

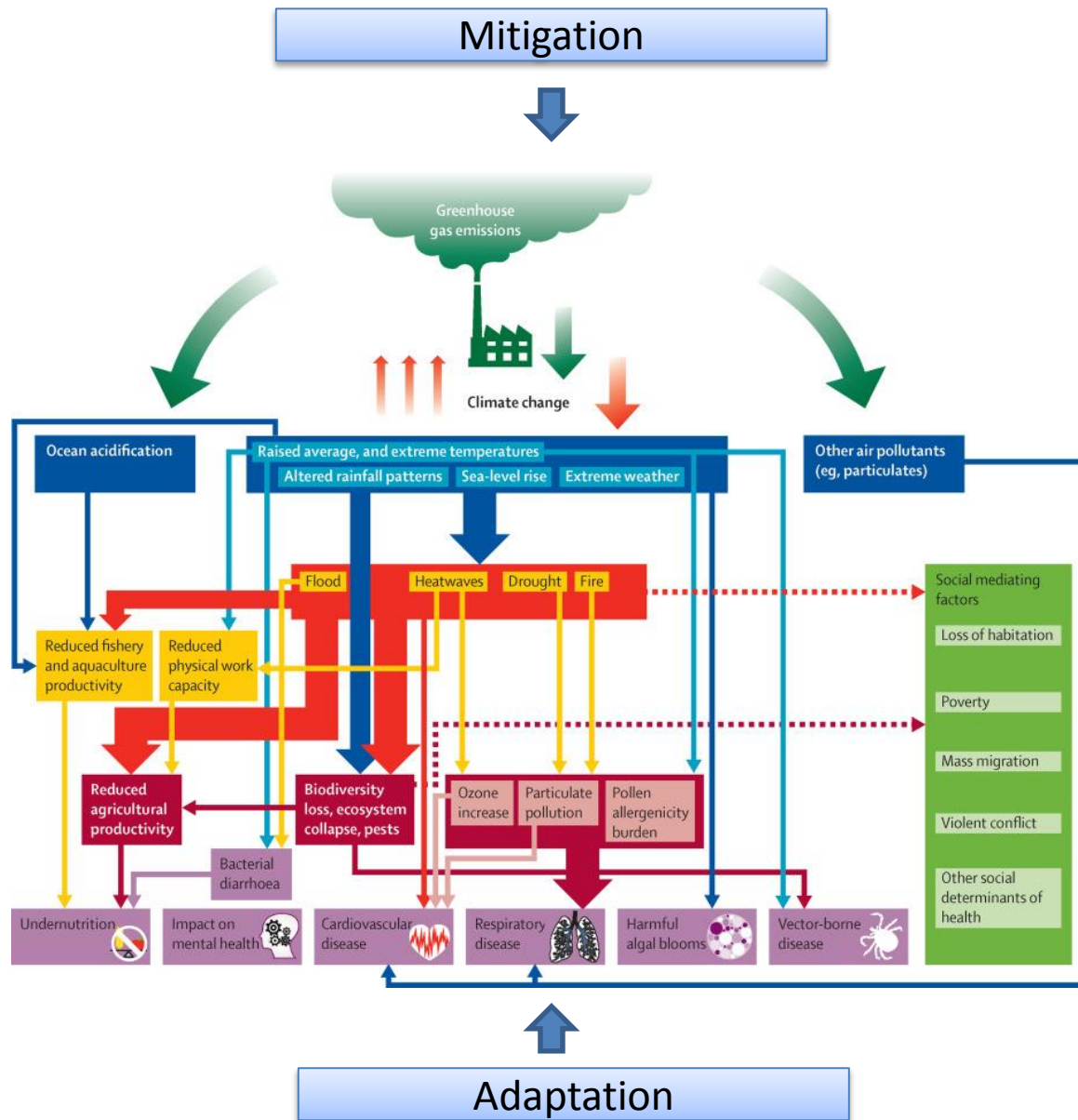
**250,000 additional deaths per year between 2030 and 2050**

### CC deaths/million



Estimates by WHO sub-region for 2000 (WHO World Health Report, 2002).  
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# Climate Change Impacts are Complex



# Health Disparities Contribute Climate Vulnerability

- Rates of diseases are associated with race and poverty
  - Stroke and cardiovascular mortality
  - Diabetes
  - Asthma
  - “Mentally unhealthy days”
- Deaths and hospitalizations increase with heat in people with:
  - Cardiovascular diseases
  - Diabetes
  - Respiratory Diseases
  - Psychiatric

**Reducing health disparities: part of the climate justice agenda**



# The Climate Gap



**There is a climate gap.** The health consequences of climate change will harm all Americans—but the poor and people of color will be hit the worst.

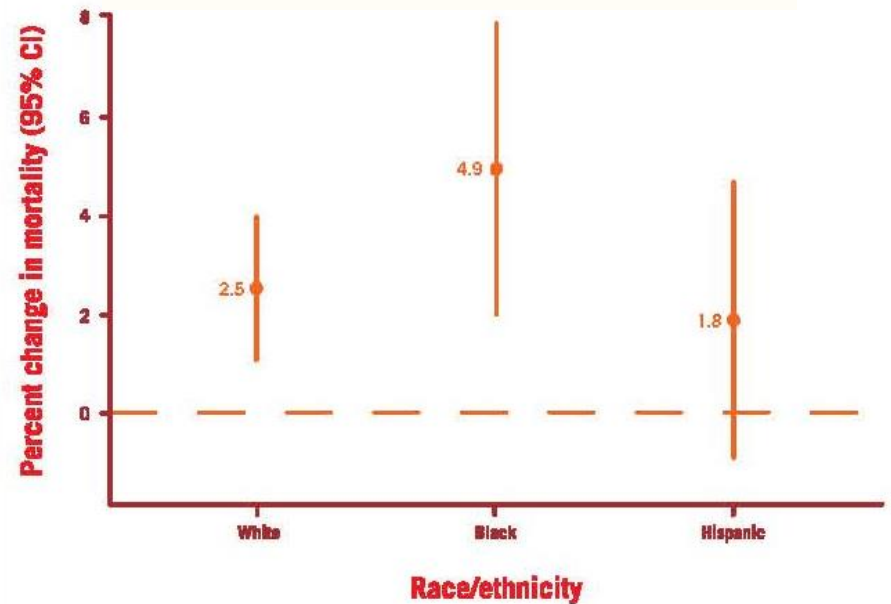



Figure 2. Percent change in mortality associated with 10°F increase in mean daily temperature by race/ethnicity in nine California counties. May through September, 1999–2003 (Source: Basu and Ostro 2008).

# Climate and Health Profile

San Francisco Climate & Health Profile

Climate Projections Health Impacts Neighborhoods Indicator Maps



SEA LEVEL RISE

EXTREME HEAT

AIR QUALITY





Climate change threatens public health.

## San Francisco Climate and Health Profile

The San Francisco Climate and Health Profile is a report that links climate change projections with their associated health outcomes, and identifies populations and locations most vulnerable to these health outcomes. The goal of the Climate and Health Profile is to support local public health climate adaptation efforts, and advance urban health and environmental justice in the climate and health field.

[Download Full Report](#)

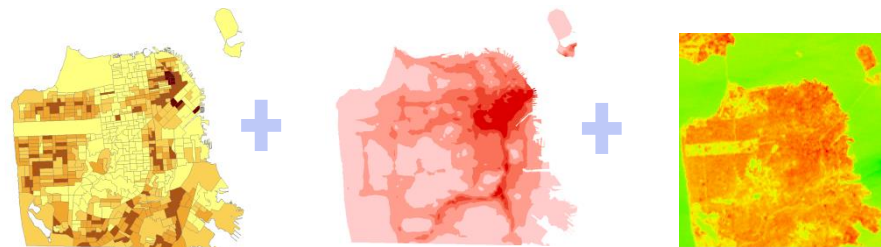
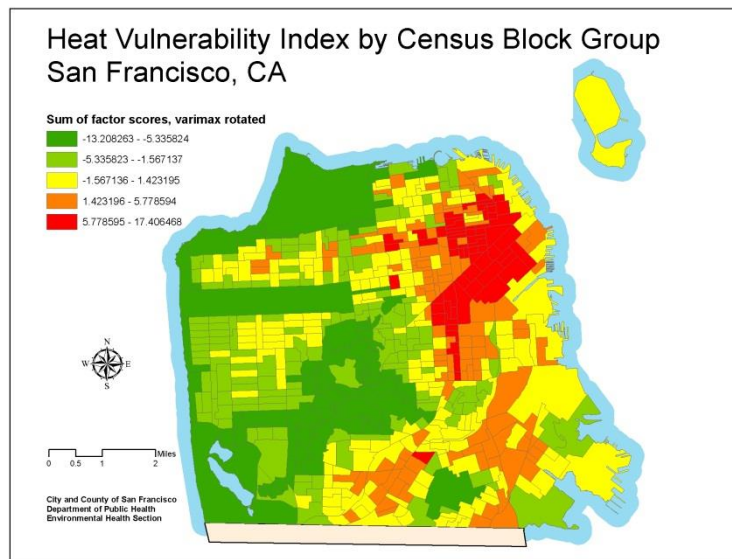
[View the Highlights](#)

-   
San Francisco Climate Projections
-   
Health Impacts
-   
Neighborhood Summary
-   
Community Resiliency Indicator Maps

# Extreme Heat Risk

## Climate and Health

Understanding the Risk:  
An Assessment of San Francisco's Vulnerability to Extreme Heat Events

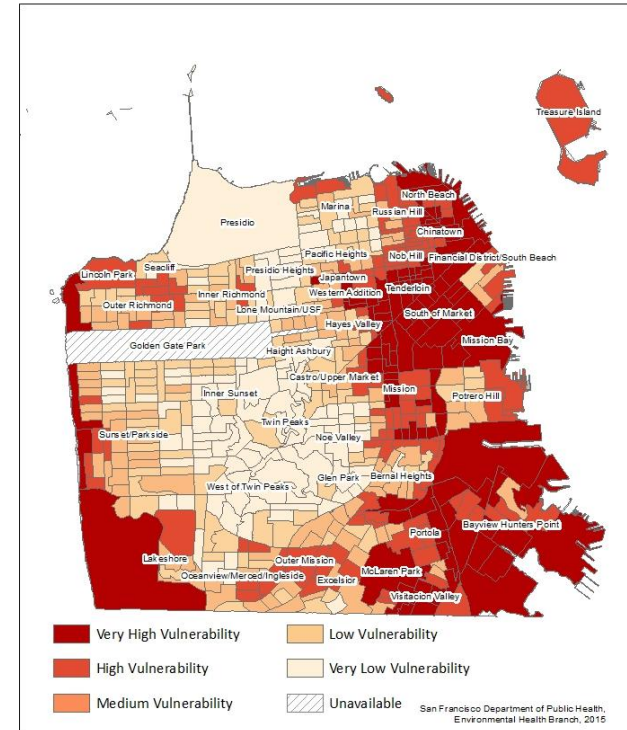




# Flooding and Extreme Storms

## Climate and Health Understanding the Risk:

### An Assessment of San Francisco's Vulnerability to Flooding & Extreme Storms



[Interactive Story Map](#)

[Live Stories](#)



San Francisco Department of Public Health  
City and County of San Francisco  
Population Health Division

Final Report, Winter 2016

# Strategies/Activities - Emergency Planning

San Francisco Department of Public Health  
Extreme Heat Response Plan  
An Annex to the SFDPH Emergency Operations Plan



PROGRAM ON HEALTH, EQUITY AND SUSTAINABILITY



## San Francisco Department of Public Health Response to a Flood Tabletop Exercise

After-Action Report/Improvement Plan  
Exercise Date: September 29, 2015





# Strategies/Activities - Education

## The most likely health outcomes of extreme storms and flooding include:



**Physical injuries** may increase due to slips and falls, automobile or bicycle collisions, or downed trees or power lines. These injuries are directly caused by flood inundation and extreme storms.



**Waterborne illnesses** are caused by proximity to contaminated water. San Francisco has little risk of contaminated drinking water, but stormwater overflows may result in raw sewage seepage onto streets or into the Bay.



**Respiratory illnesses** that impact the lungs, throat, and airways can be spread through airborne particles. Mold growth from water intrusion or flooding in buildings, as well as water damage which may cause exposure to toxic building materials, can trigger asthma, allergies, and other respiratory illnesses.



**Vector-borne disease** can be exacerbated by flood events since rainy seasons, particularly after dry seasons, have been proven to be correlated with rodent vectors such as hantavirus. Standing water may additionally attract mosquito vectors.



**Foodborne illnesses** may increase if a significant power outage impacts refrigeration in residents and food establishments, as well as if a combined sewer overflow impacts shellfish and other coastal seafood.



Any **disruption to the city medical services**, either by power outage or transportation network disruption, may cause additional health impacts. Residents dependent on methadone clinics or dialysis may need to find alternative treatments during service disruption.



**Carbon monoxide poisoning** is a potential health impact of power outages after hazard events. The poisoning is typically caused by improper usage of generators which that emit a harmful, odorless gas.



We are all at risk of increased sensitivity to **mental health impacts** before, during, and after hazard events. These impacts can be caused, triggered, or exacerbated by stress, isolation, or anxiety associated with events.



Any major flood inundation or extreme storm event may lead to **income loss**. Income loss has been correlated with many public health impacts.



## Staying Healthy in the Heat

**Climate and Health** is leading San Francisco's efforts to prepare the city's most vulnerable for climate change emergencies, while advancing urban health, social, and environmental justice.

The impact of climate change on human health is a major concern, especially for populations at high risk which include the elderly, low income, and those with chronic mental disorders and preexisting medical conditions.

**SFDPH Environmental Health**  
improving environments  
protecting health

PROGRAM ON HEALTH, EQUITY AND SUSTAINABILITY



# Next Steps

- **Climate and Health Adaptation Plan**

- Climate Health Risks
- Baseline Conditions
- Potential Interventions
- Indicators of Success
- Opportunities within the Health Department
- Stakeholder Engagement

- **Goals**

- Emphasize the wider scope of vulnerable populations
- Bring together Public Health and Health Care Delivery Systems
- Interagency and Cross Sector Collaborations
- Reduce health burden from climate change

