

Climate & Health Tools and Innovations to Inspire Local Action



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City and County of San Francisco

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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

Climate Projections

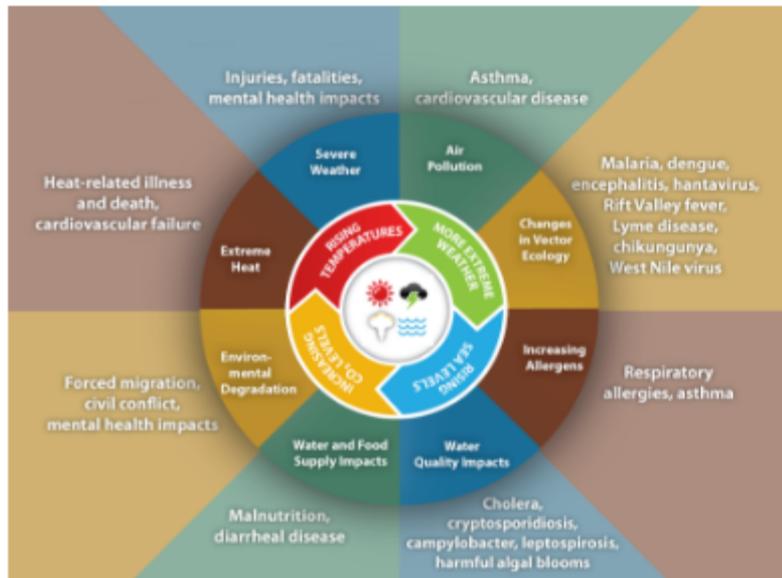


HAZARD	CLIMATE IMPACT	HEALTH IMPACT
Temperature 	Average yearly temperature to increase between 4.1 and 6.2 degrees Fahrenheit by 2100 Extreme Heat Days (over 85F) to increase by 15-40 by 2050, potentially 90 by 2100 Increase in heat wave length and frequency.	<ul style="list-style-type: none"> • Heat-Related Illness <ul style="list-style-type: none"> ◦ Dehydration ◦ Heat Stroke • Heat-Related Mortality <ul style="list-style-type: none"> ◦ Heart Disease • Air Quality Effects <ul style="list-style-type: none"> ◦ Respiratory Illness ◦ Asthma ◦ Allergies • Mental and Behavioral Health
Sea level Rise 	Projections indicate that in the most likely scenario, sea levels will rise between 7-15 inches by 2050 and 26-46 inches by 2100	<ul style="list-style-type: none"> • Fatal and Nonfatal Injury • Water-borne disease • Mental and Behavioral Stressors • Income Loss
Extreme Storms 	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.	<ul style="list-style-type: none"> • Fatal and Nonfatal Injury • Water-borne disease • Mental and Behavioral Stressors • Strain on public health infrastructure • Income Loss
Drought 	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.	<ul style="list-style-type: none"> • Income Loss • Food Insecurity <ul style="list-style-type: none"> ◦ Malnutrition • Air Quality / Allergens <ul style="list-style-type: none"> ◦ Respiratory Illness ◦ Asthma ◦ Allergies • Mental and Behavioral Health

Health Impacts

Health Impacts of Climate Change

Climate change impacts a wide-range of health outcomes. This page illustrates the most salient climate change impacts, their effect on exposures, and the subsequent health outcomes that result from these changes in exposures.



EXTREME HEAT

SEVERE WEATHER

AIR POLLUTION

CHANGES IN VECTOR ECOLOGY

INCREASING ALLERGENS

WATER QUALITY IMPACTS

WATER AND FOOD SUPPLY IMPACTS

1. An extreme drought could limit California agricultural output and increase the price of produce in San Francisco.
2. In drought years, San Francisco will have to require water rationing.
3. In children, food insecurity has been linked to increased rates of cognitive developmental deficits and behavioral and psychological dysfunction.

ENVIRONMENTAL DEGRADATION

Neighborhood Summaries



Total Resiliency Score: 2

Resiliency Rank: 25

Jump to an indicator:

- [Hazard](#)
- [Environment](#)
- [Transportation](#)
- [Community](#)
- [Public Realm](#)
- [Housing](#)
- [Economy](#)
- [Health](#)
- [Demographics](#)

Neighborhoods are scored by their resiliency to climate change per category on a scale of 1 (least resilient) to 5 (most resilient).

[Download raw data here.](#)

[← Back to Neighborhoods](#)

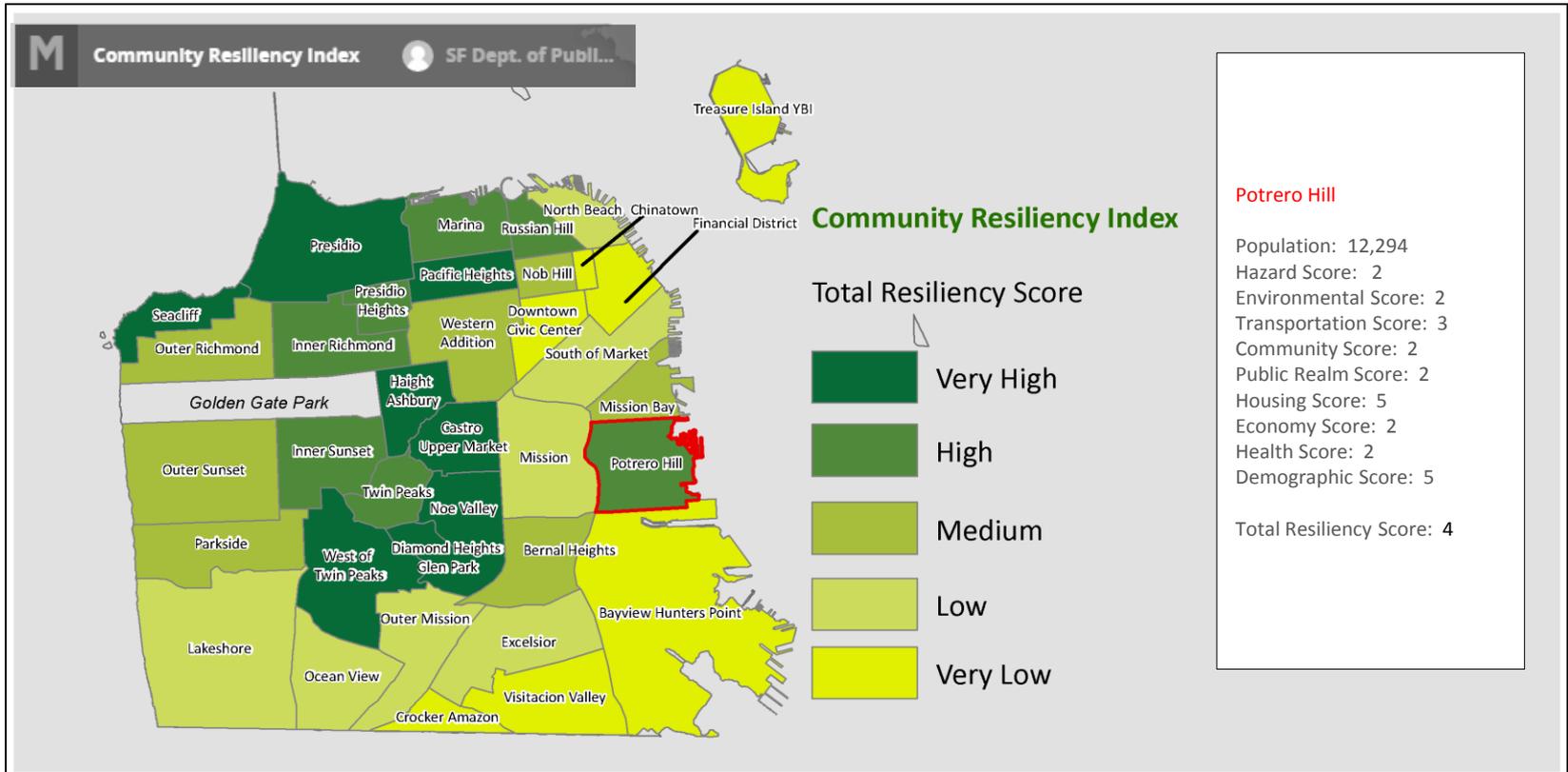
Mission



Image Source: Wikimedia Commons User:Victorgrigas

CATEGORY	INDICATOR	RESILIENCY SCORE
Hazard	Percent of the neighborhood in the 100 year storm flood plain.	0.0%
	Percent of the neighborhood in 'high' or 'very high' heat vulnerability areas	78.1%
	Percent of the neighborhood in a liquefaction or landslide zone	31.4%
Hazard Risk Score		2
Environment	Percent impervious surface	83.7%
	Percent tree cover	7.5%
	Average annual PM2.5 concentration from all sources	8.8
	Percent of the neighborhood a contamination risk	6.3%

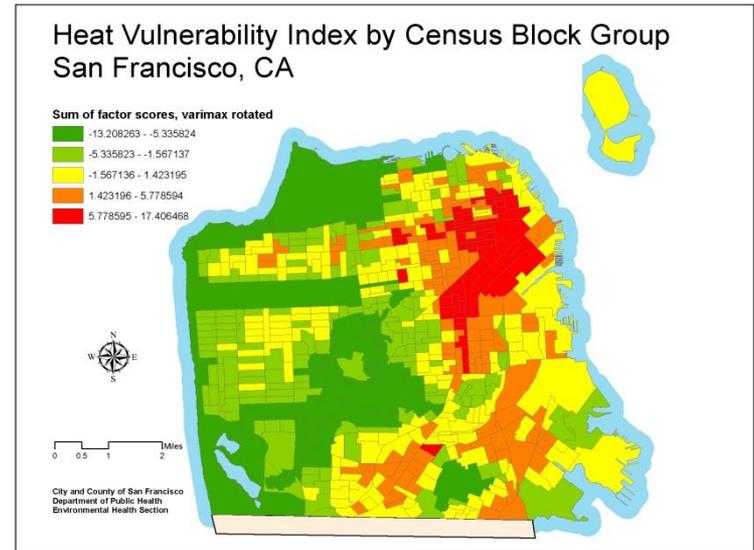
Community Resiliency Indicators



Extreme Heat Risk

Climate and Health

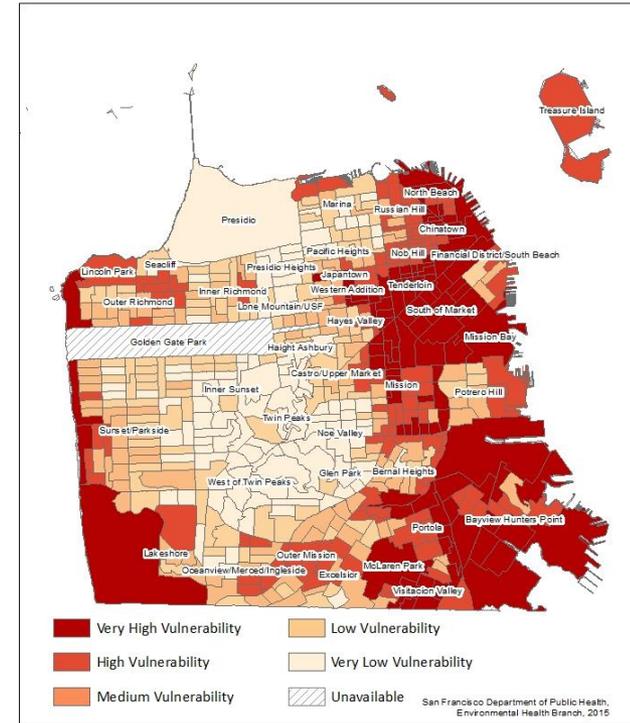
Understanding the Risk:
An Assessment of San Francisco's Vulnerability to Extreme Heat Events



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



San Francisco Flood Vulnerability: A Health Focused Assessment

Click each of the indicators below to view the corresponding map.

Coastal Flood Risk: This indicator shows flooding from a 100-year storm in the year 2100, which is projected to add an additional 36 inches on top of sea level rise. In total, such a scenario would result in 77-inches of inundation, and represents the scenario San Francisco is using for planning purposes.

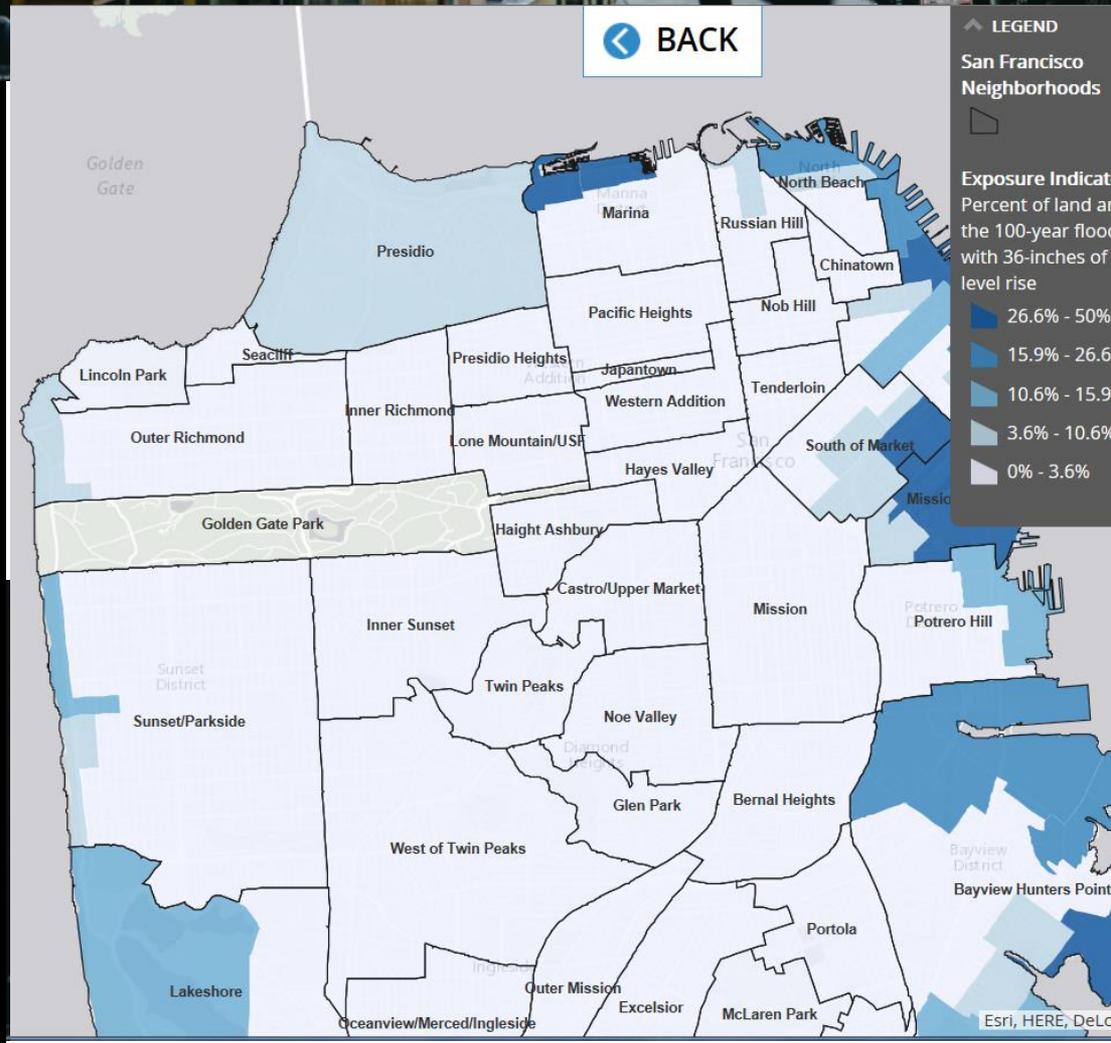
Inland Flood Risk: This indicator shows the percent of land area with over 6-inches of projected flood inundation during a 100-year storm. This data layer was created using a 100-year, 3-hour storm scenario that shows flooding depth above grade in locations where that depth exceeds the 6-inch height of storm drains.

Elevation: Exposure to both coastal and inland flood inundation is higher at lower elevations. Although elevation was factored into both the inland and coastal flood risk models, it was included as a separate indicator in the flood vulnerability index because of its status as a preeminent determinant of most likely locations for flood inundation.

Section 2: Living Conditions

The quality of one's housing and living conditions affects an individual's vulnerability to flooding in various forms. Residents living in poor quality housing and populations without access to housing or a strong social network are at higher risk of adverse health impacts from flood inundation and extreme

<http://arcg.is/1WFW05D>





HEALTH IMPACTS OF CLIMATE CHANGE

MOLD, RESPIRATORY
ILLNESS, AND HOW YOU
CAN PROTECT YOURSELF

Climate change is happening now and faster than expected. We often think of climate change as impacting our environment, but as the planet warms, changes in temperature and precipitation are going to lead to other effects that threaten human health and safety. Weather patterns will trend towards the extremes: storms and drought, heat waves and cold snaps, and these events will have robust and cascading impacts on your health. A major health

<http://bit.ly/1Sw0Y57>

Health Impacts of Mold Exposure Include...

- ☹️ Cough or Wheeze
- ☹️ Pneumonia
- ☹️ Asthma Attacks
- ☹️ Dermal (skin) and Ocular (eye) Irritation
- ☹️ Nasal Congestion
- ☹️ Upper Respiratory Tract Infections
- ☹️ Mental Health Impacts
(Depression, Memory Loss, Difficulty Concentrating)
- ☹️ Headache
- ☹️ Diarrhea
- ☹️ Pulmonary Hemorrhage (in Infants)

People living in moldy homes are...



...50% more likely to currently have asthma.



...33% more likely to have ever been diagnosed with asthma.



...50% more likely to cough.



...44% more likely to wheeze.



...52% more likely to have upper respiratory tract symptoms.



...linked to a 50% increase in the odds of having at least four colds in a year.

Strategies/Activities - Emergency Planning

San Francisco Department of Public Health Extreme Heat Response Plan

An Annex to the SFPDH Emergency Operations Plan



City Cooling Centers



- 1 - New Valley Branch Library, 451 Jersey Street
- 2 - Anza Library, 550 37th Avenue
- 3 - Mission Branch Library, 300 Bartlett Street
- 4 - Golden Gate Valley Library, 1801 Green Street
- 5 - Glen Park Branch Library, 2825 Diamond Street
- 6 - Mission Bay Branch Library, 560 4th Street
- 7 - Chinatown Branch Library, 1135 Powell Street
- 8 - Annunciation Greek Orthodox Cathedral, 245 Valencia Street
- 9 - Bethel Christian Church, 1325 Valencia Street
- 10 - Bill Graham Civic Auditorium, 99 Grove Street
- 11 - Davies Symphony Hall, 201 Van Ness Avenue
- 12 - Embarcadero YMCA, 169 Stewart Street
- 13 - Enola Maxwell Middle School of the Arts, 655 De Haro Street
- 14 - Holy Trinity Greek Orthodox Church, 999 Brotherhood Way
- 15 - Lock-Wilmerding High School, 755 Osgan Avenue
- 16 - Mescone Center North & South, 747 Howard Street
- 17 - Mescone Center West, 800 Howard Street
- 18 - Nob Hill Masonic Auditorium, 1111 California Street
- 19 - Notre Dame Des Victoires Church, 566 Bush Street
- 20 - Palace Hotel, 2 New Montgomery Street
- 21 - Sacred Heart Cathedral Preparatory, 1055 Ellis Street
- 22 - San Francisco Christian Center, 5045 Mission Street
- 23 - St. Anne's Church, 850 Church Street
- 24 - St. Ignatious College Preparatory, 2001 37th Avenue
- 25 - Stonestown Family YMCA, 333 Eucalyptus Drive
- 26 - Stonestown YMCA Annex Building, 3150 20th Avenue
- 27 - Veteran's Building (War Memorial), 401 Van Ness Avenue
- 28 - War Memorial Opera, 301 Van Ness Avenue

Cooling Centers are only opened in the event of an official Health Warning.
Be certain to call the cooling center to verify availability and hours.
More neighborhood based cooling centers will be added in 2014.



Strategies/Activities - Education

Extreme Heat Preparedness



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



Climate models predict . . .

BY 2050, THERE WILL BE

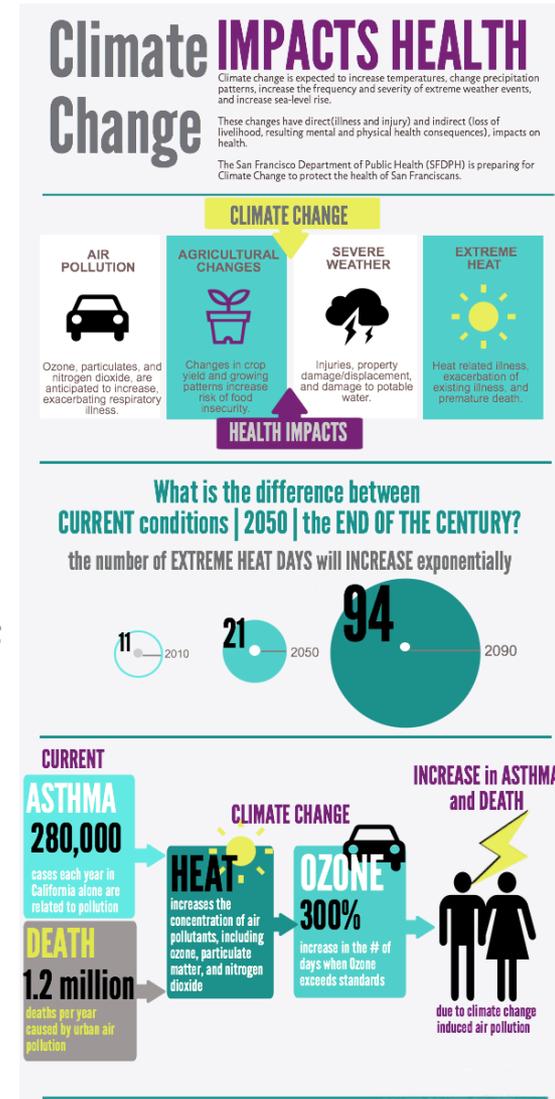
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EXTREME HEAT DAYS
IN SAN FRANCISCO



Call to Action

- **Simply Science**
- **Place Based** - Importance of maps to communicate at risk areas and conversations about variation with the neighborhoods
- **Community Connection** Importance of personal stories and experience
- **Healthy Equity** - Emphasizing the wider scope of vulnerable populations
- **Climate and Health Adaption Plan**



Ready to Change

We can prevent the most catastrophic climate scenarios

“Tackling climate change could be the greatest global health opportunity of this century” ~
Lancet June 2015

Promote mitigation and adaptation strategies with health co-benefits. “No-Regret” options