

Climate Change & Health

A Framework for Action

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CAT Public Health Work Group
May 1, 2014



Center for
Climate Change & Health





“Climate change is the biggest global health threat of the 21st century... The impacts will be felt all around the world – and not just in some distant future but in our lifetimes and those of our children.”

The Lancet



USDA, Wikimedia Commons



WQVA, Wikimedia Commons



Suat Emri, freedigitalphotos.net

Why aren't we doing more?

- No funding, no resources
- No mandate, not our job, silos
- Lack capacity
 - Funding, resources, knowledge, expertise
- Lack leadership
- Competing priorities
 - Tyranny of the urgent
- **Unclear exactly how this relates to what we do now**
- **Unclear what exactly we can do**

Physical Environments





Services Environments

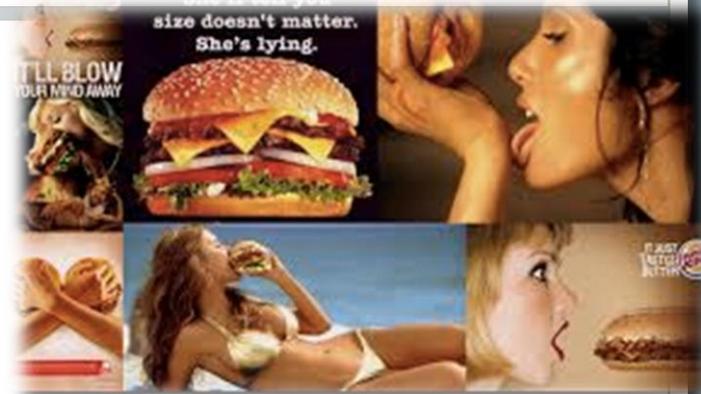


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Social Environments



Economic Environments





Place Matters

ZIP CODE **95219**
Life Expectancy

73



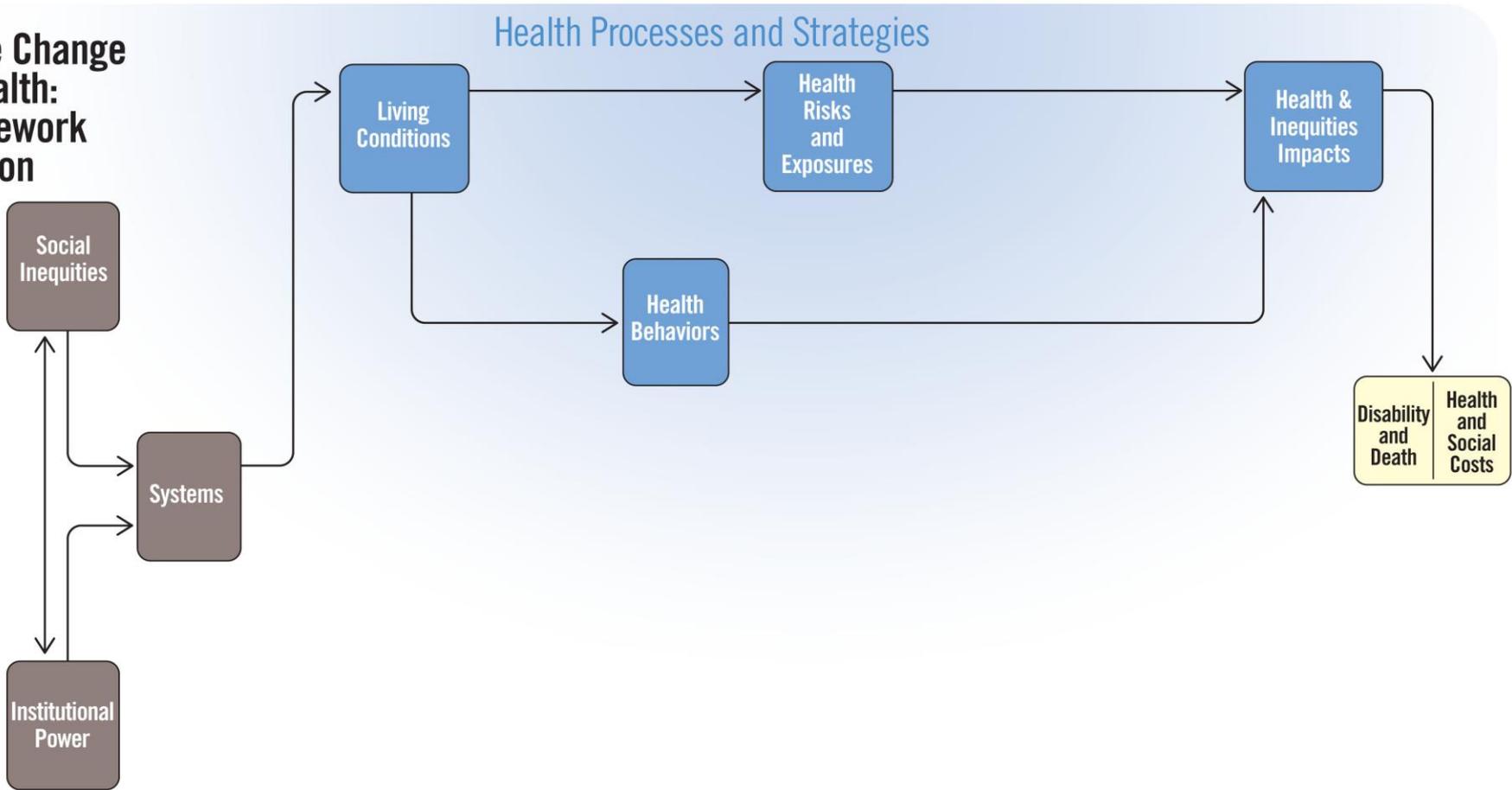
88

ZIP CODE **92657**
Life Expectancy

health
happens
here

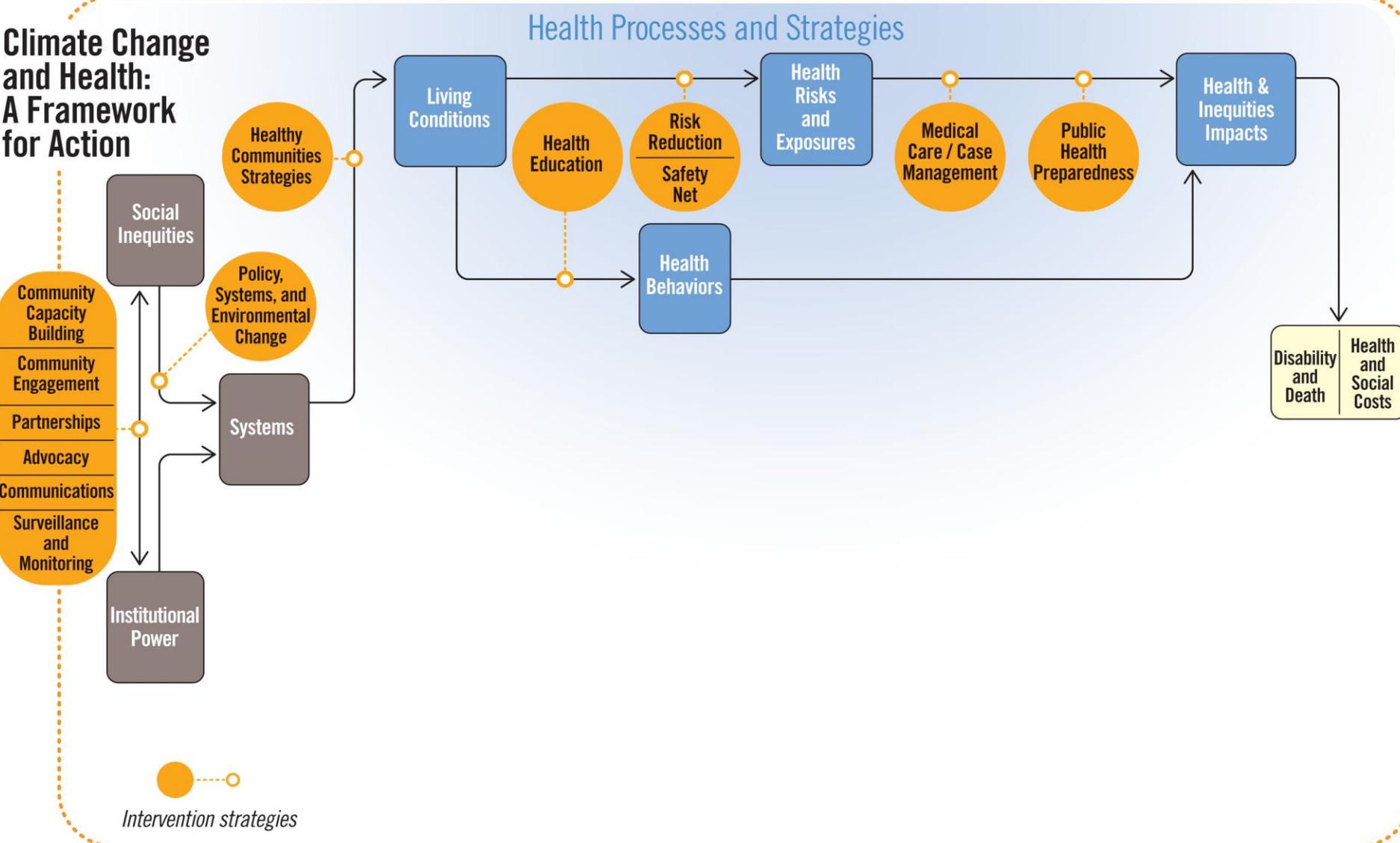


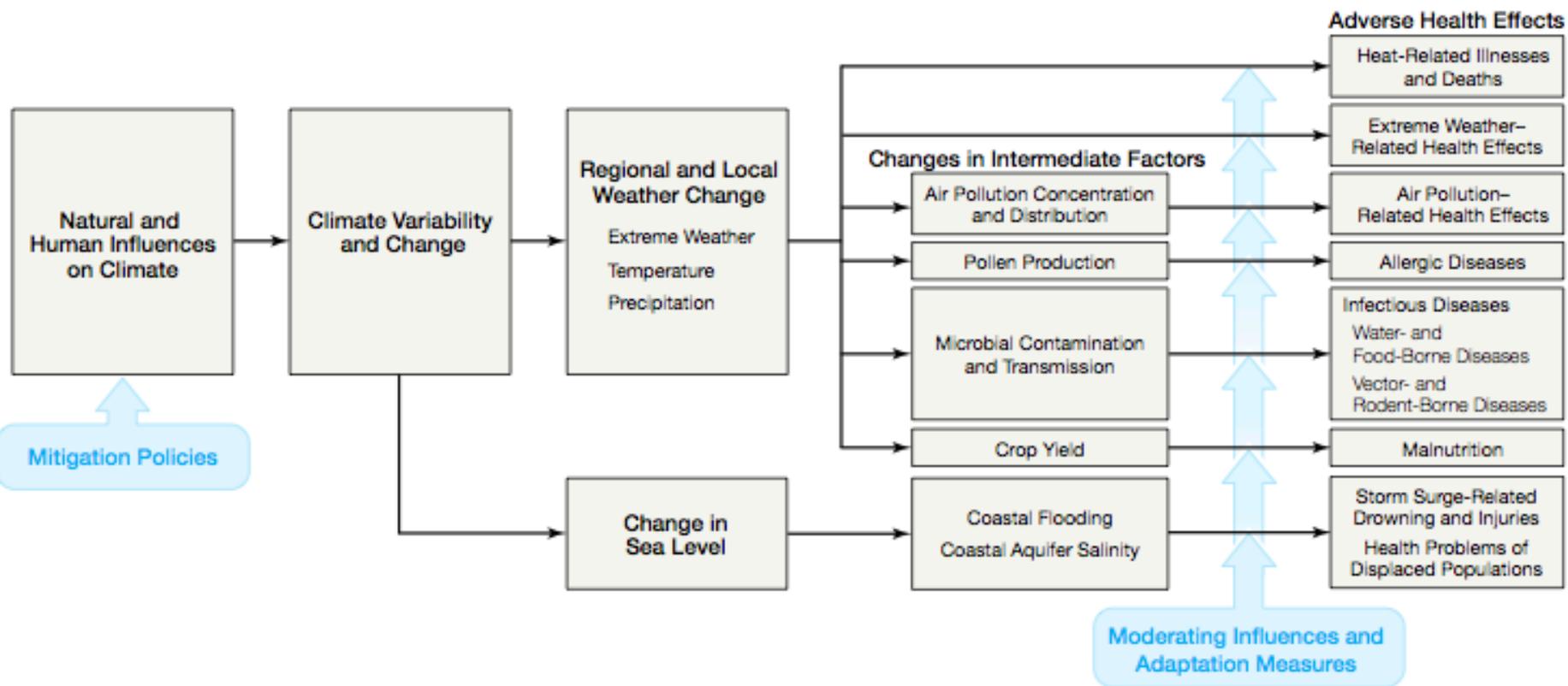
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Mitigation Policies for Reduction of Greenhouse Gas Emissions

Energy Efficiency
Use of Renewable Energy Sources
Forest Preservation

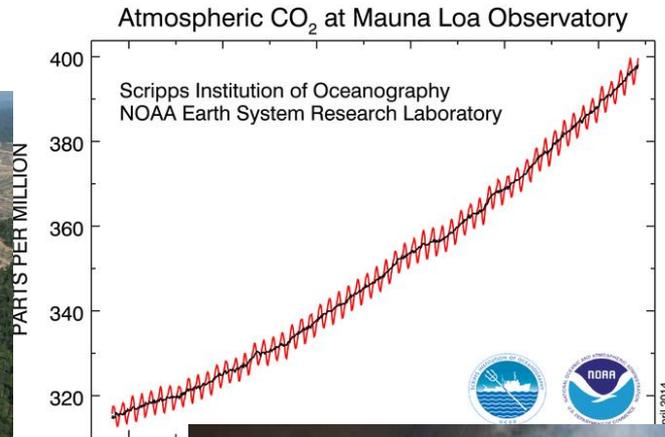
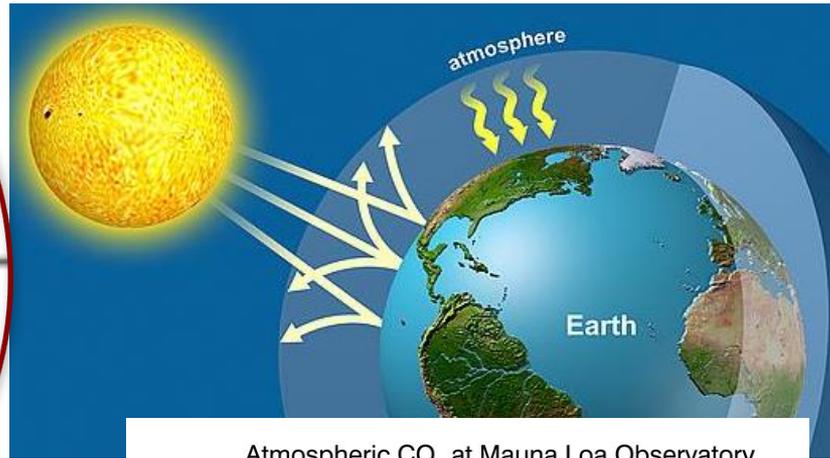
Moderating Influences

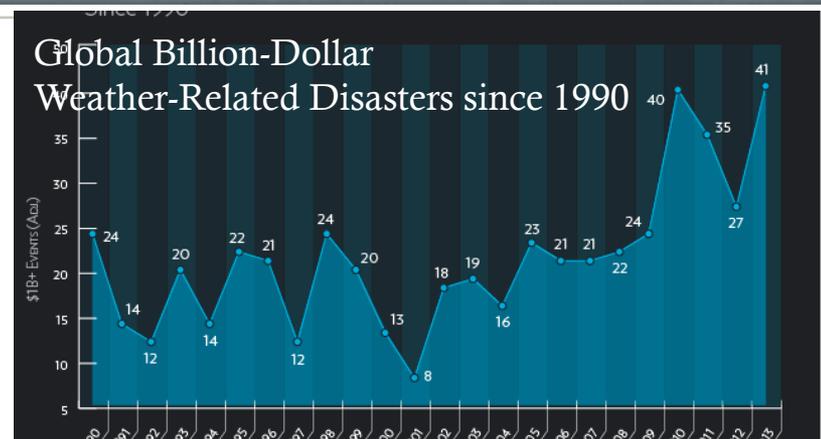
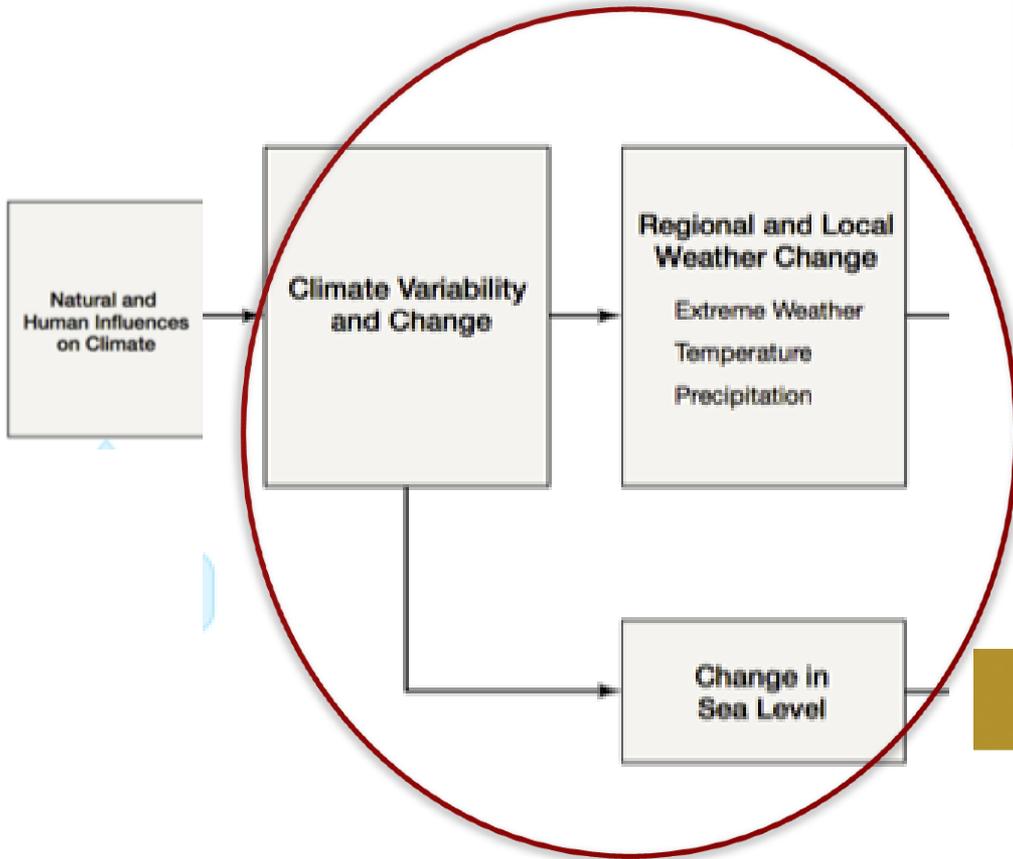
Population Density and Growth
Level of Technological Development
Standard of Living and Local Environmental Condition
Preexisting Health Status
Quality and Access to Health Care
Public Health Infrastructure

Adaptation Measures

Vaccination Programs
Disease Surveillance
Protective Technologies
Weather Forecasting and Warning Systems
Emergency Management and Disaster Preparedness
Public Health Education and Prevention
Legislation and Administration

Natural and Human Influences on Climate





NATIONAL ACADEMY OF SCIENCES
 NATIONAL ACADEMY OF ENGINEERING
 INSTITUTE OF MEDICINE
 NATIONAL RESEARCH COUNCIL

REPORT

IN BR

Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future

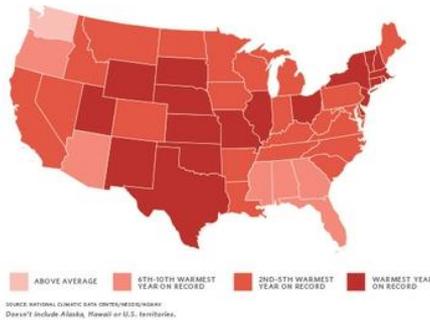
6" by 2030, 12" by 2050, 36" by 2100

Temperature

2012 WAS THE SECOND MOST EXTREME YEAR ON RECORD FOR THE NATION

SOURCE: NOAA, U.S. CLIMATE EXTREMES INDEX

RECORD HEAT ACROSS THE U.S. STATE-BY-STATE TEMPERATURES IN 2012



ALSO IN 2012:

WARMEST YEAR ON RECORD FOR THE U.S.
Doesn't include Alaska, Hawaii, or U.S. territories.
SOURCE: NOAA

356 RECORD HIGH TEMPERATURES TIED OR BROKEN
IN THE UNITED STATES.
SOURCE: NOAA, STATE OF THE CLIMATE REPORT



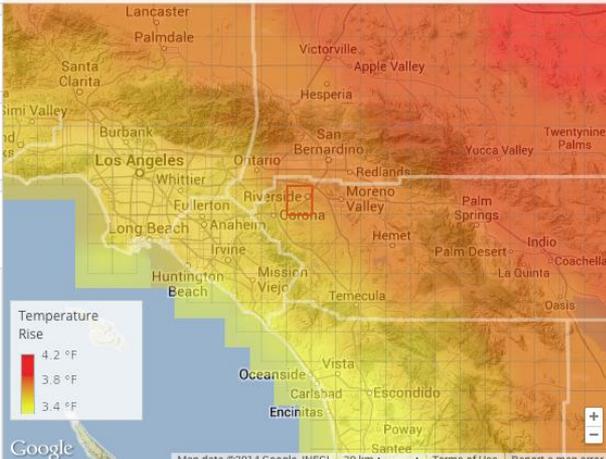
APPROXIMATELY **ONE-THIRD OF THE U.S. POPULATION EXPERIENCED 100+ TEMPERATURES**
FOR TEN OR MORE DAYS.
SOURCE: NOAA

LO Public Domain [White House](#)



Temperature

Projected changes in annual average temperatures for the low emissions scenario



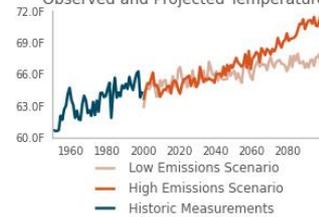
Use Metric Units Use County Average

CENTRAL FS MAGNOLIA AREA

The information in the chart below corresponds to the selected area on the map (outlined in orange).

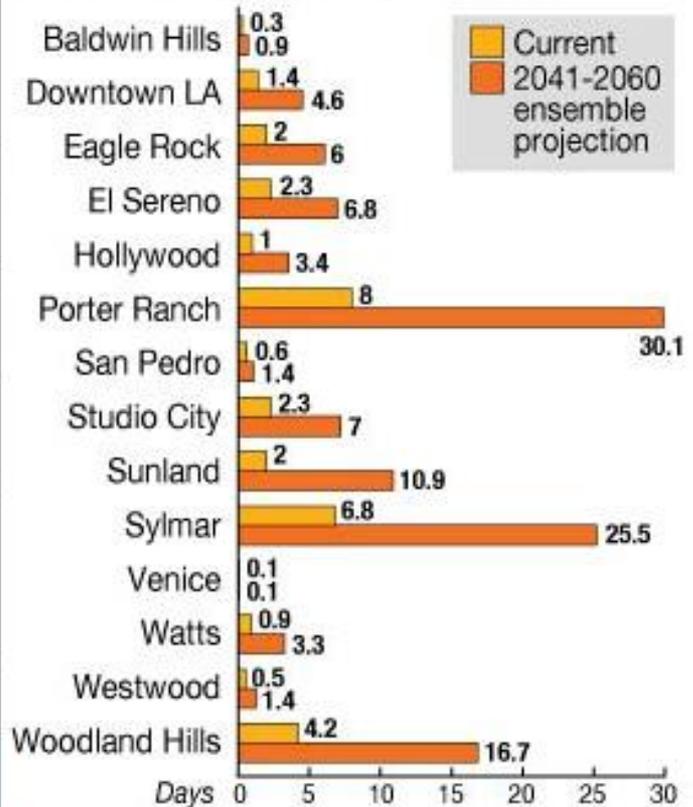
Historical Average	63.5 °F
Low-Emissions Scenario:	67.2 °F +3.7 °F
High-Emissions Scenario:	70.0 °F +6.5 °F

Observed and Projected Temperatures

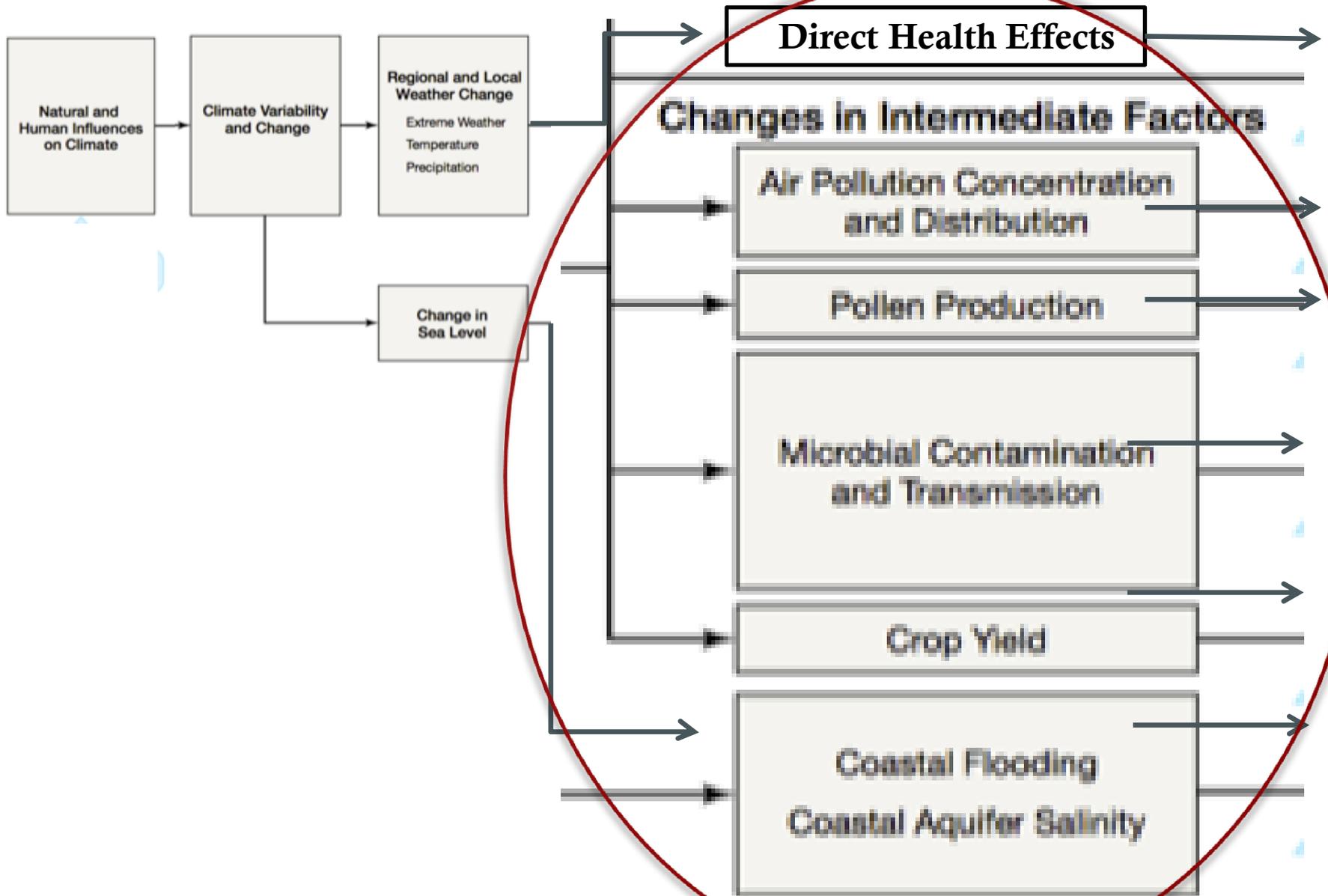


Current and projected temperature extremes for the Los Angeles area

Average annual days exceeding 95 degrees F

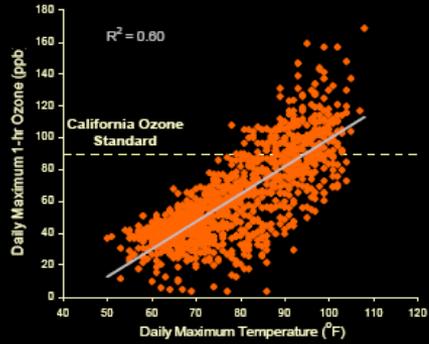


UCLA LARC 2012

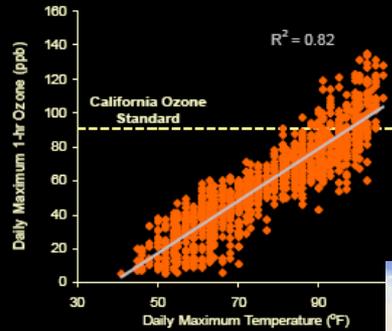


Higher Temperatures Worsen Air Pollution

Ozone versus Temperature



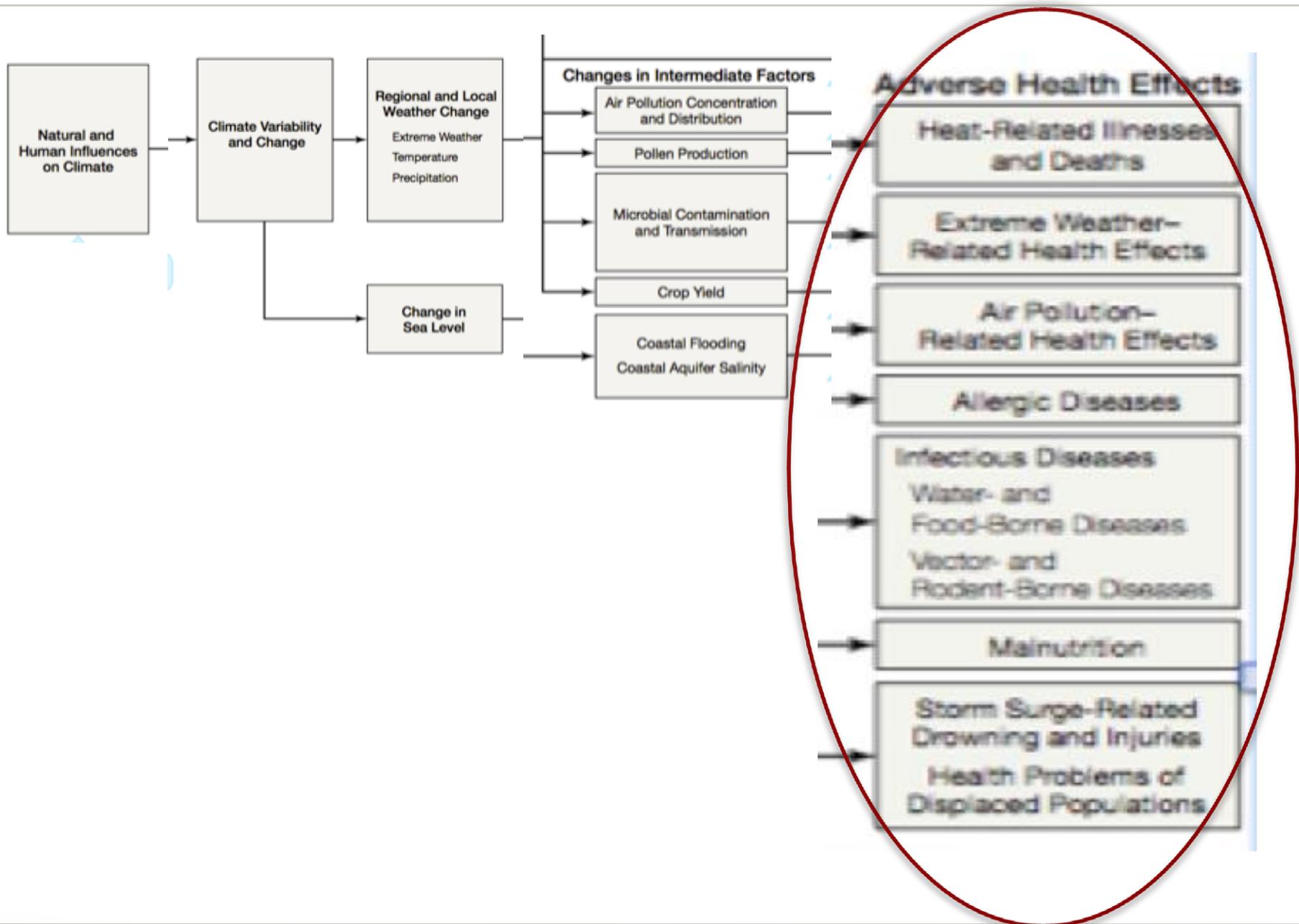
Riverside, 2003-2005



Fresno, 2003-2005



Photo: Tudor Van Hampton / ENR



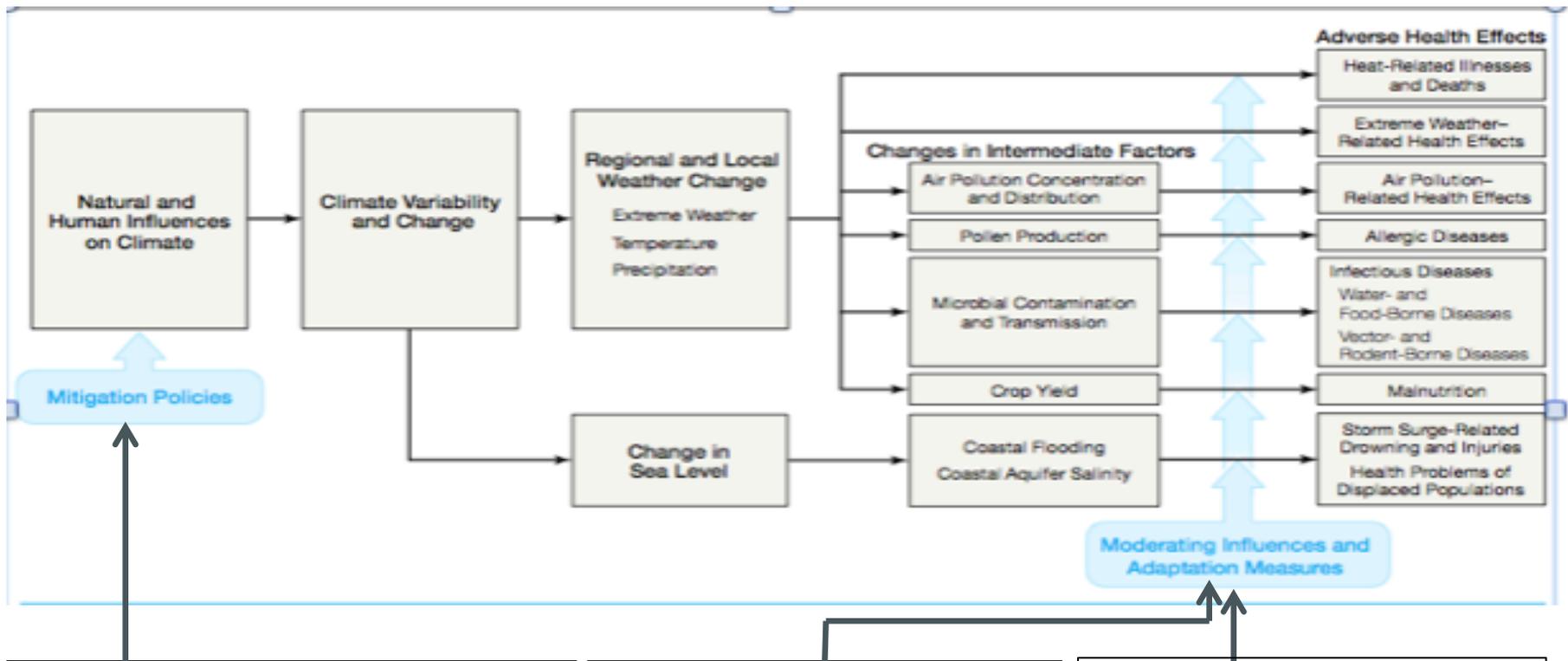




Health-Care Costs of Climate Events

Climate-related health stressor	Premature Deaths	Hospitalizations	Total Health-care Costs \$\$ (thousands)
Ozone pollution	795	4,150	6,534,642
Heat wave	655	1,620	5,353,425
Hurricane	144	2,197	1,392,833
Infectious disease	24	204	207,447
River flooding	2	43	20,357
Wildfires	69	778	578,640
Total	1,699	8,992	\$14,087,344

Knowlton, Health Affairs, 2011



Mitigation to cut GHG emissions

- Clean renewable energy
- Fuel/energy efficiency
- Reduce VMTs
- Low carbon fuels
- Forest preservation
- Reduced meat consumption

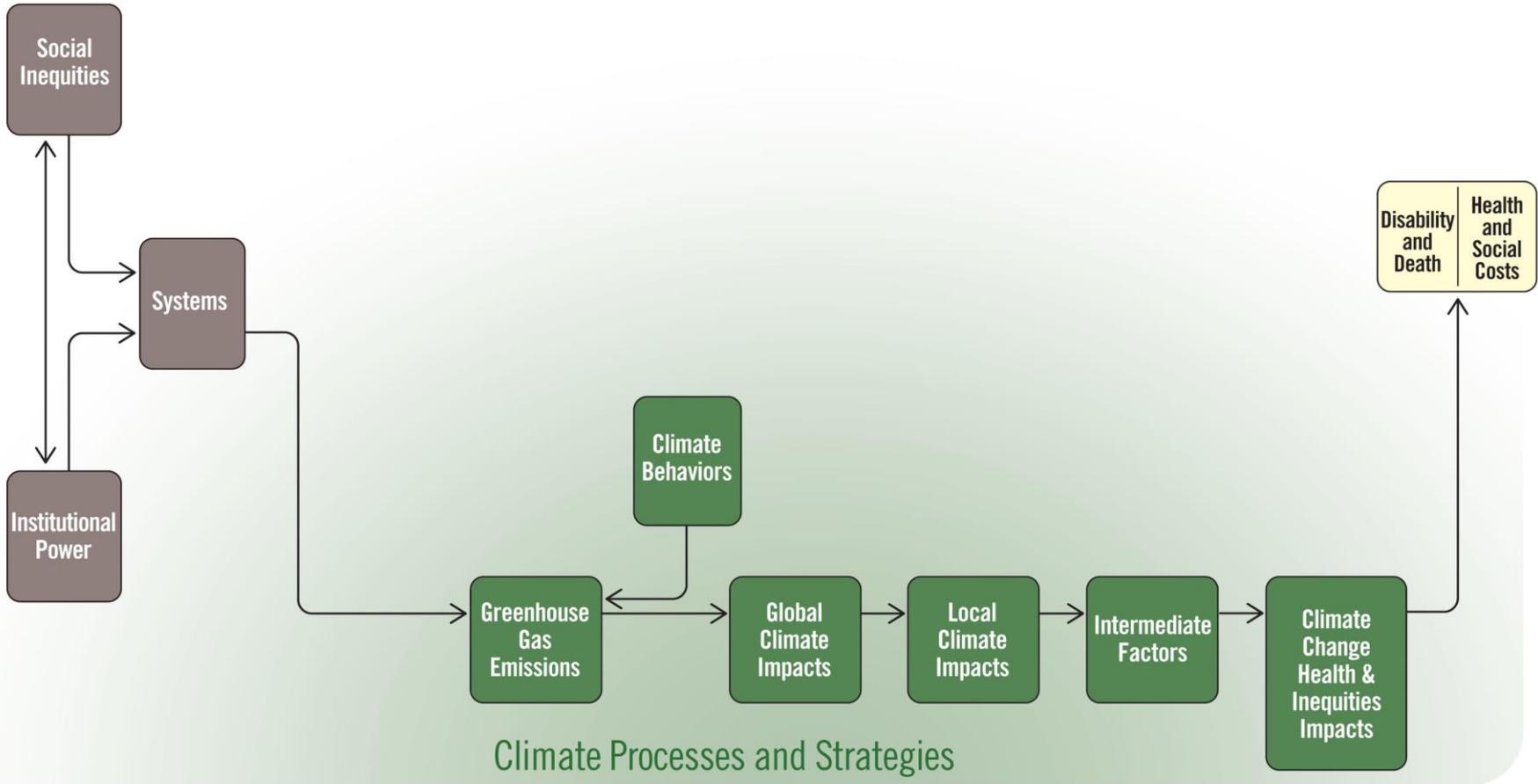
Moderating influences

- PH infrastructure
- Health services
- Population health status
- Level of development
- Population density

Adaptation measures to reduce impacts of climate change

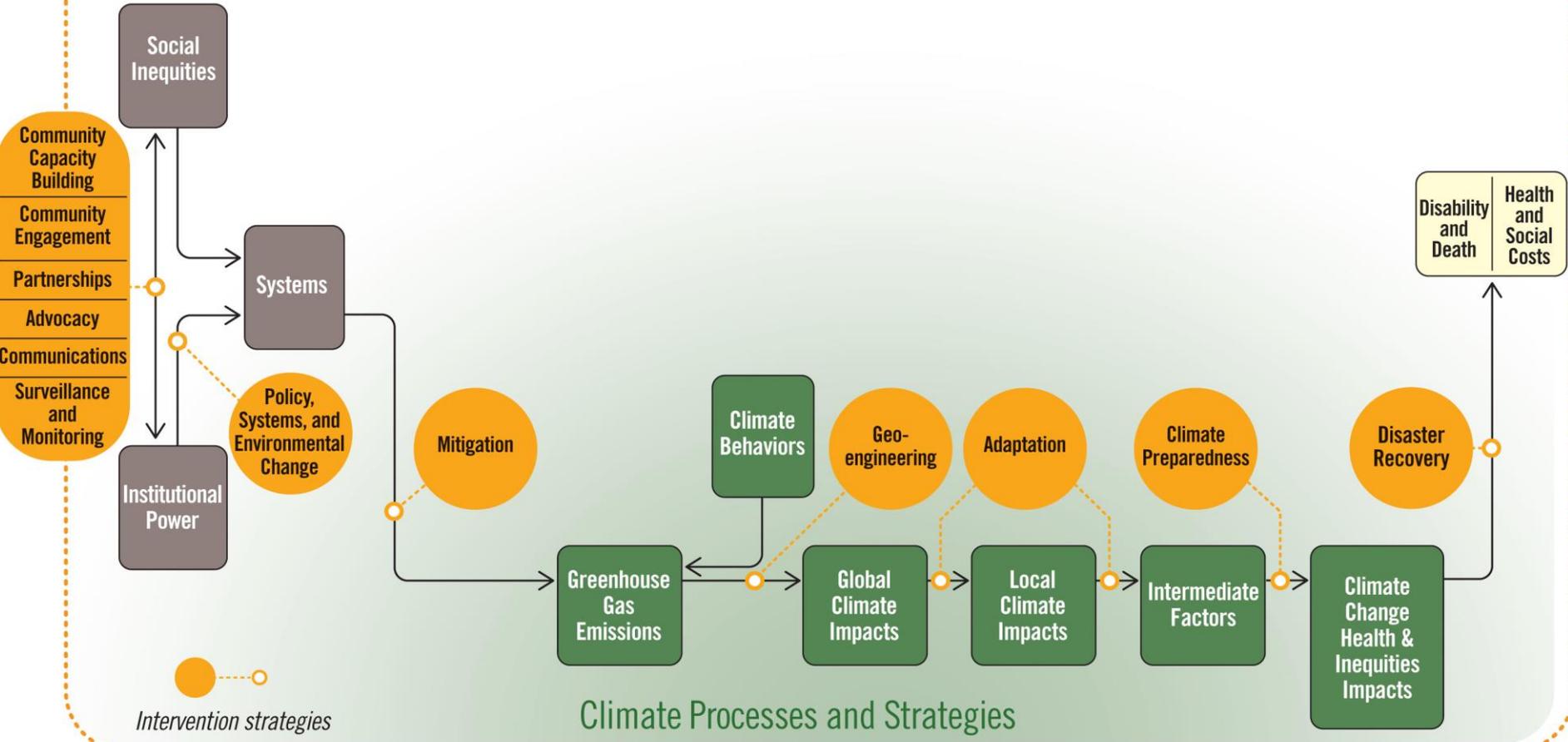
- Infrastructure
- Warnings, surveillance
- Preparedness/recovery
- Sustainable agriculture
- Urban greening

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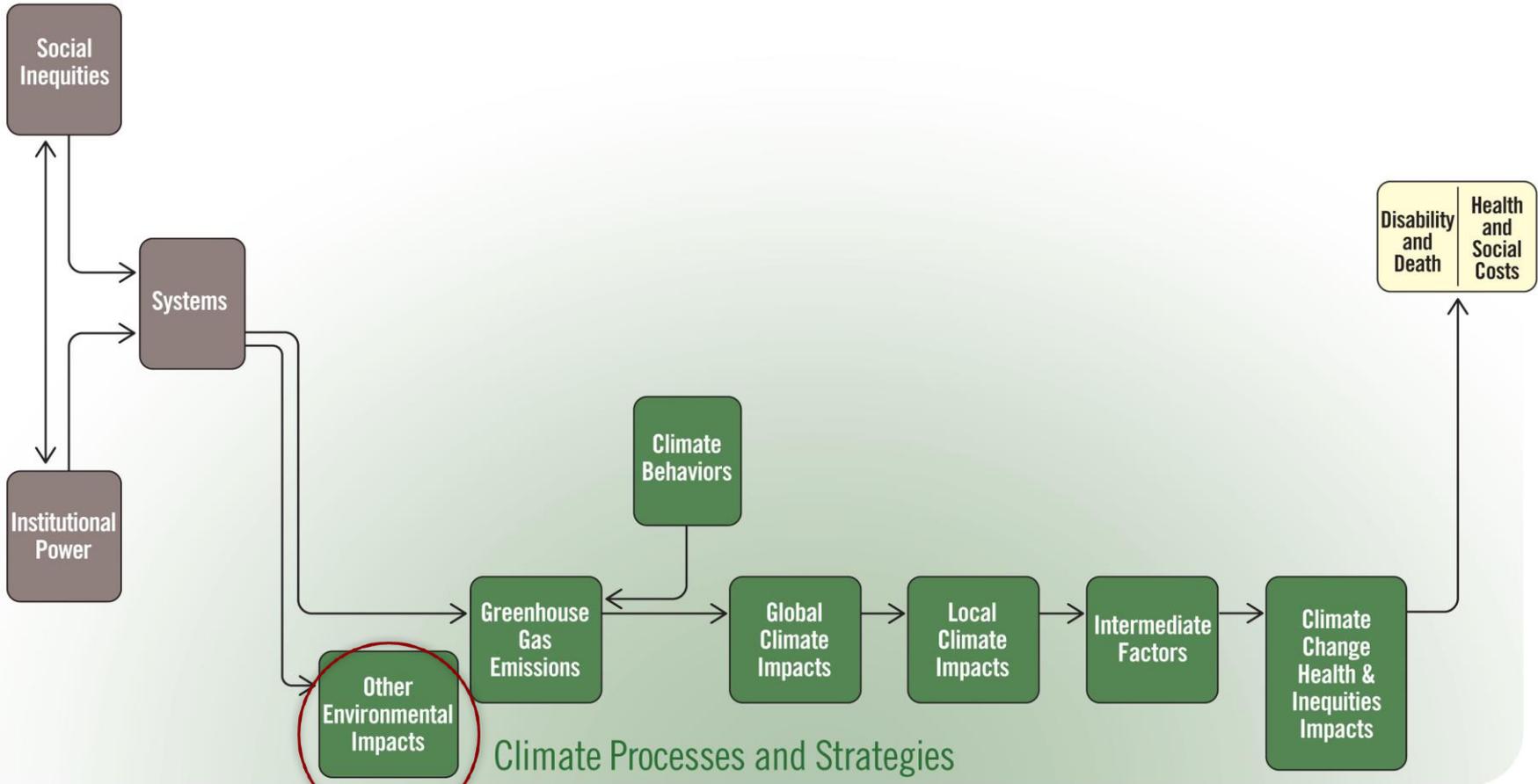
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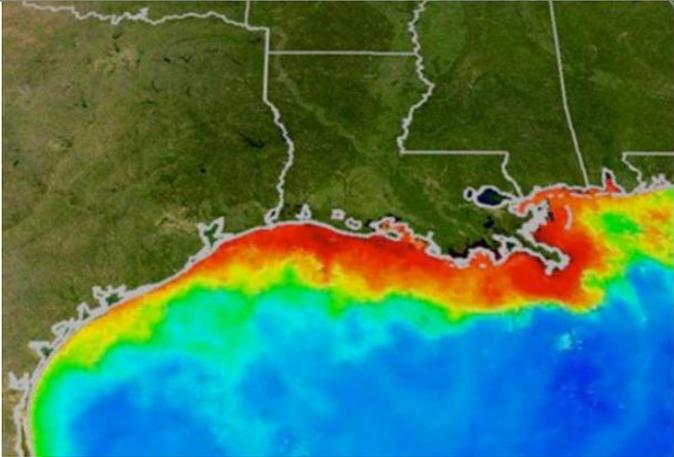
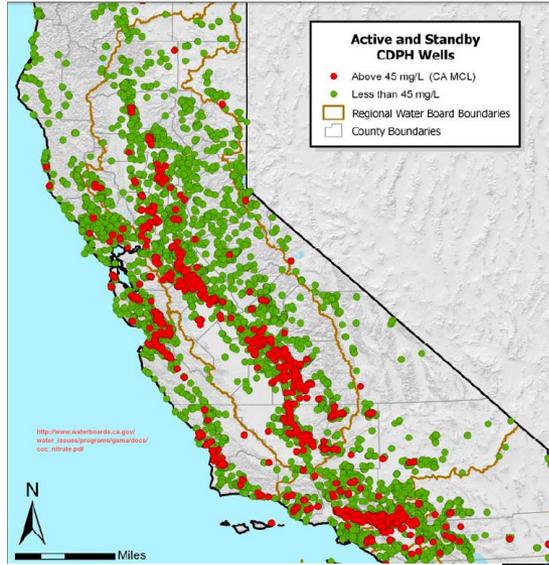


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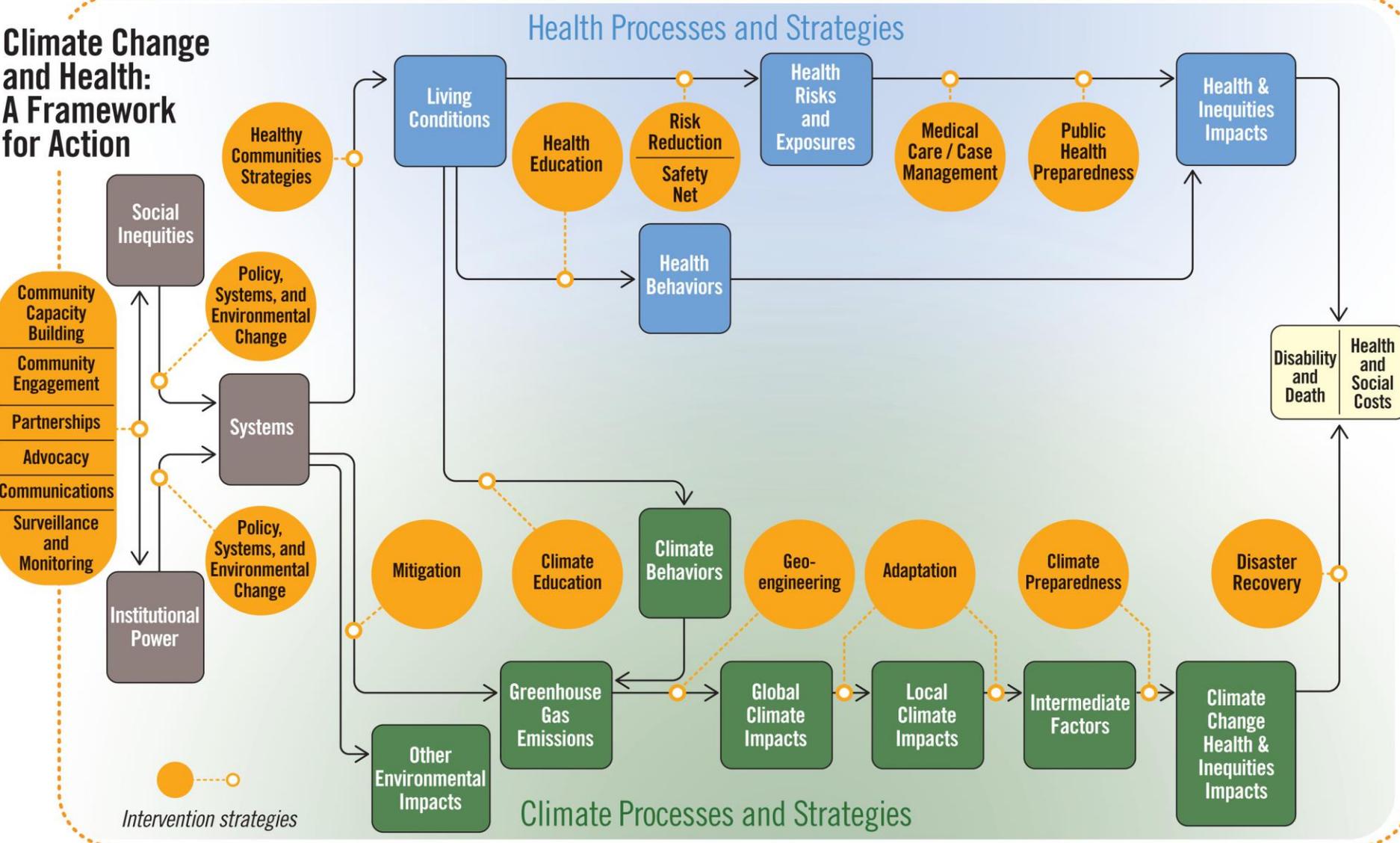
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Vulnerability & Resilience

- Vulnerability
 - the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of ecological or climate change
 - human populations at higher risk, due to both environmental and individual factors
- Resilience
 - the capacity of an ecosystem to respond to a disturbance – for example a flood or drought or pest invasion - by resisting damage and recovering
 - the capacity of an individual, community, or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function and prosper
- Characteristics of resilience or vulnerability co-exist at the same time in any community or individual.
- Together, the intersection of resources, including social connection, coping mechanisms, exposures, and susceptibility that will determine the extent to which climate change impacts health and well-being.

Individual & Community Climate Vulnerability & Resilience

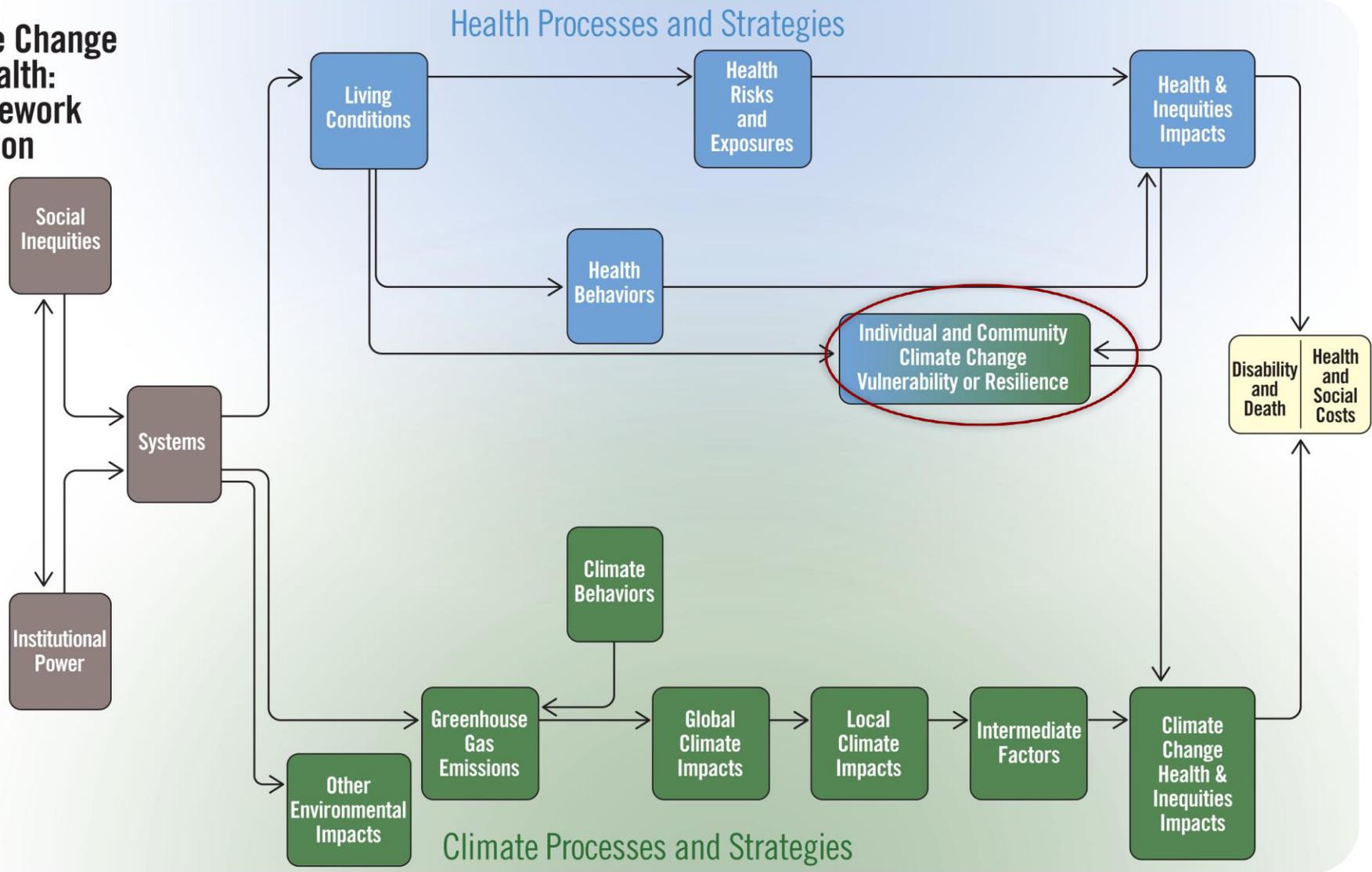
- Population health status
- Public health infrastructure
- Government function
 - Health, social services
- Food systems
- Infrastructure
 - Transportation, housing
- Economic status
- Social support
- Population density



A close-up of a child's face, split vertically. The left side shows a young girl's eyes and the right side shows a young boy's eyes. Overlaid text reads: "ZIP CODE 95219 Life Expectancy 73 < 88 ZIP CODE 92657 Life Expectancy". Below this is the logo "health happens here" with a location pin icon.



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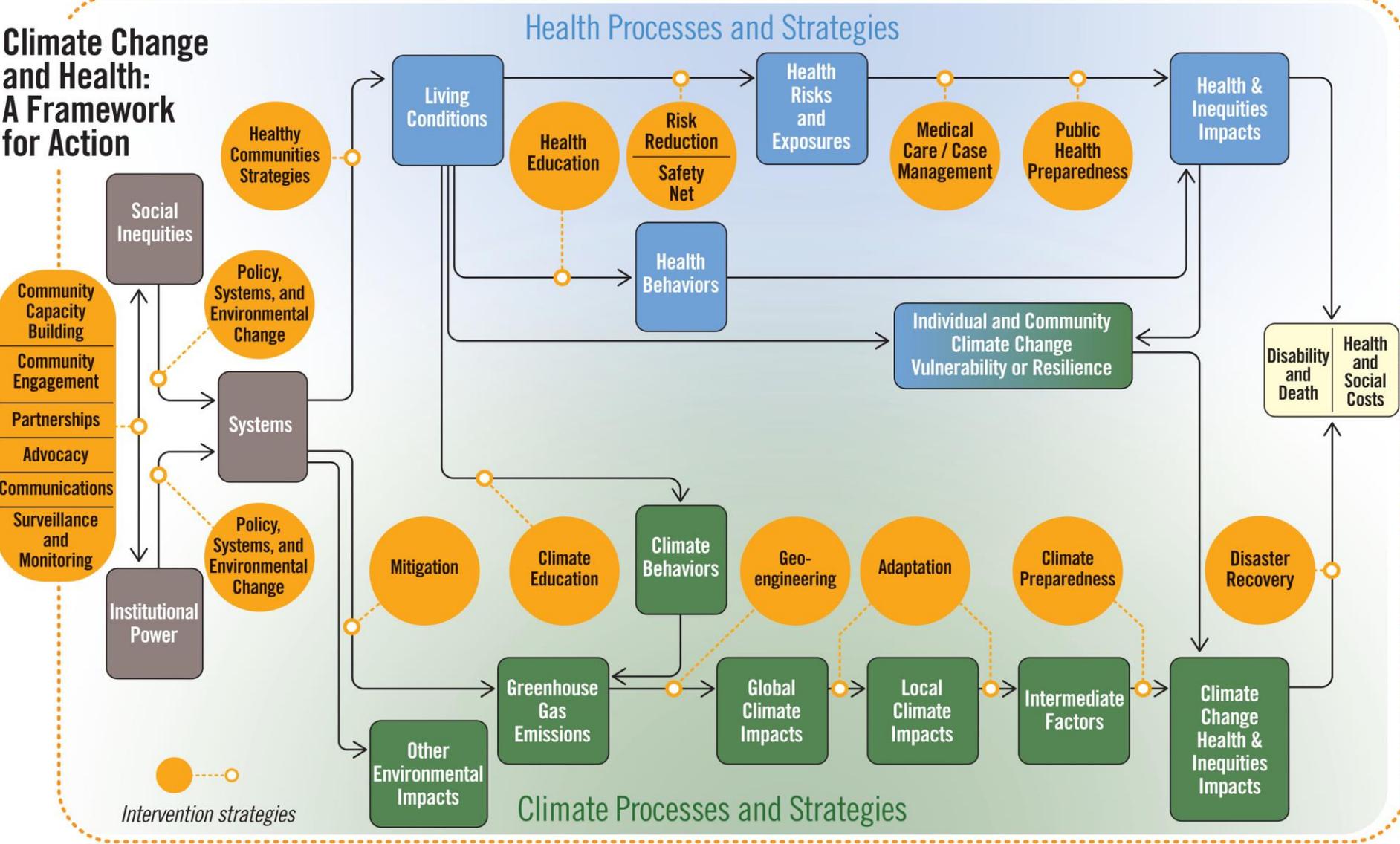


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The Climate Gap

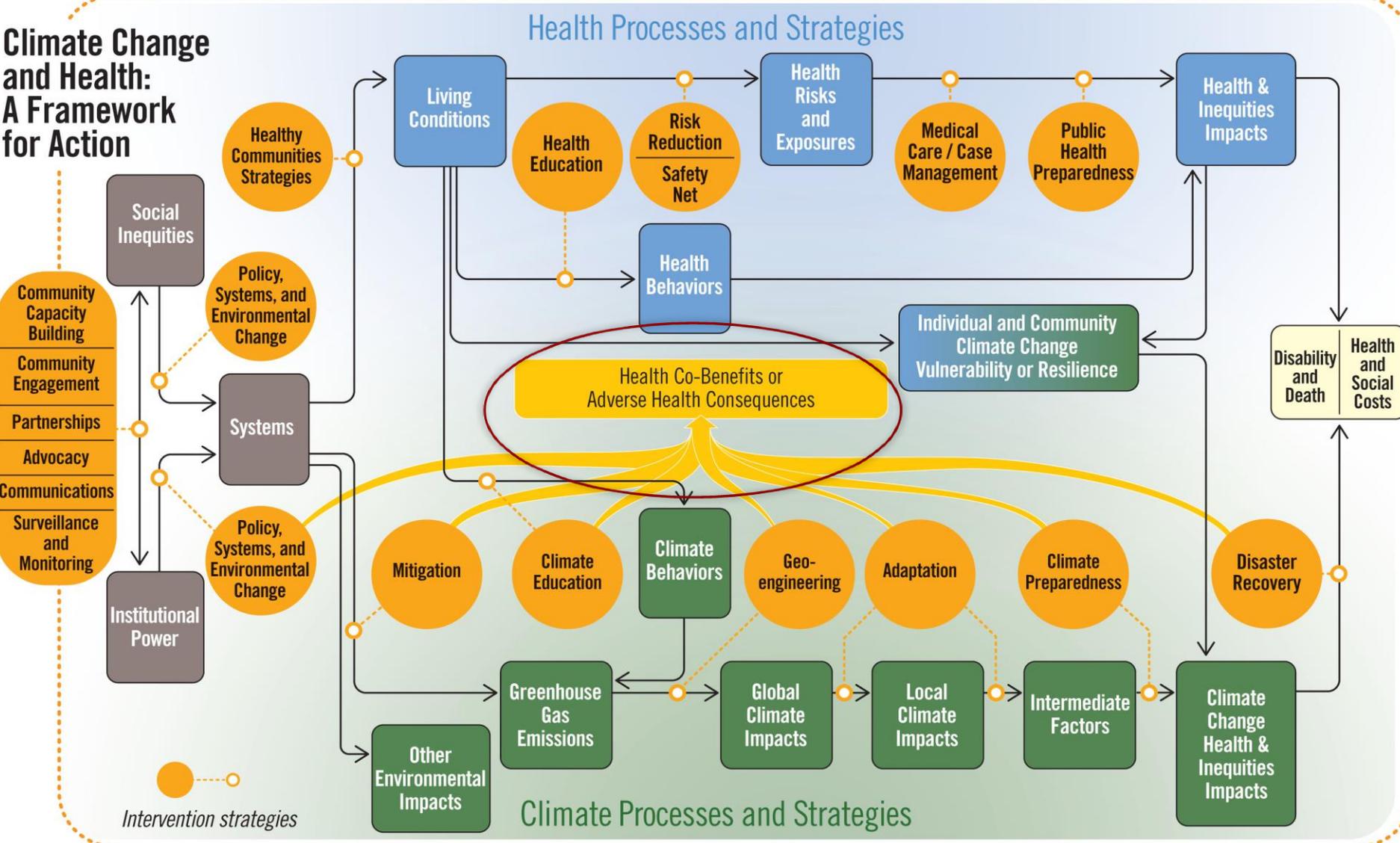


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Active Transportation Co-Benefits

- Reductions
 - Air pollution
 - Noise
 - Infrastructure costs
 - Community severance
 - GHG emissions
 - Increases
 - Physical activity
 - Social capital
- Reductions
 - Respiratory disease
 - Cardiovascular disease
 - Diabetes
 - Depression
 - Osteoporosis
 - Cancer Stress
 - Avoidable increases
 - Bike/ped injuries

Co-benefits of Sustainable, Local Food Systems

- Reductions

- GHG emissions
- Pesticide use
- Synthetic fertilizer use
- Food miles
- Antibiotic use
- Water pollution
- Soil erosion
- Biodiversity loss
- Meat consumption
- Unsustainable H2O consumption

- Increases

- Access affordable healthy food
- Rural community strength
- Agricultural land preservation

- Reductions

- Obesity
- Cardiovascular disease
- Cancer (breast, prostate, colorectal)
- Type II Diabetes
- Antibiotic resistance
- Pesticide illness



Heat Resilience Co-Benefits

- Urban greening
 - Places to be active
 - Healthy food access
 - Reduce storm water run-off
 - Decrease flooding risk
 - Replenish groundwater
 - Improve aesthetics
 - Reduce crime
- Reduce heat island effect
 - Reduce heat illness risk
 - Decrease energy consumption
 - Lower energy costs
 - Reduce air pollution



Climate Change and Health

- Climate change has direct impacts on health & well-being
- Climate change is a threat multiplier
 - Climate change exacerbates existing health challenges
- Climate change effects the systems on which human life depends – air, water, food, shelter, security.
- Climate change disproportionately impacts vulnerable populations and disadvantaged communities
- **Co-benefits offer many opportunities to simultaneously improve health and address climate change**

Mitigation - IPCC 5th Report

- Human-caused CAPS continue to increase (1970-2010);
- Current actions are not consistent with keeping temperature increase to less than 2°C
- Without additional measures, project 3.7 to 4.8°C increase in global mean temperature in 2100 (*high confidence*)
- Require substantial cuts in emissions by mid-century through large-scale changes in energy systems and possibly land use
- Delaying more robust GHG emissions reductions through 2030 will substantially increase difficulty of transition, costs, and narrow options

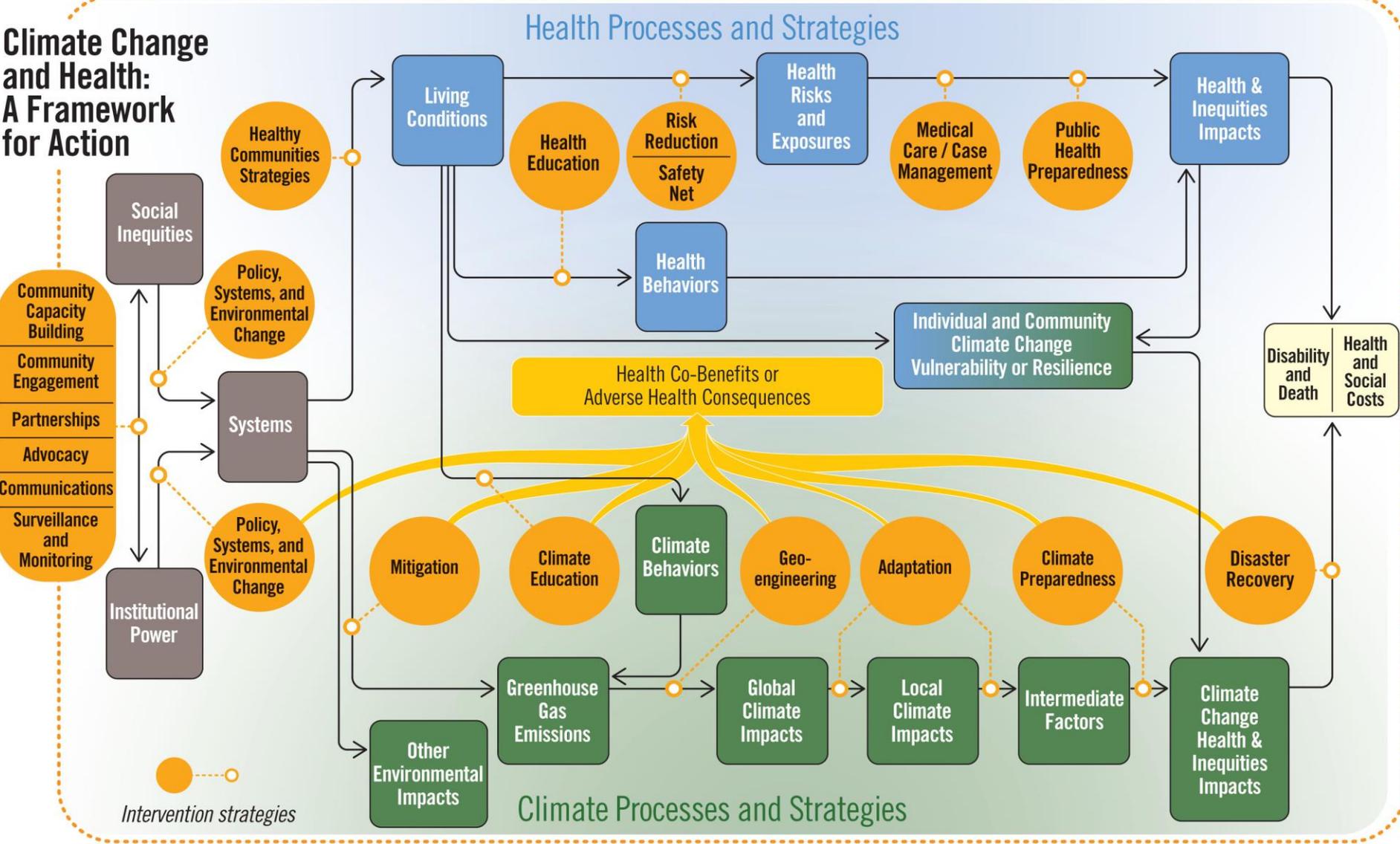
<http://www.ipcc.ch>

Public believes climate change is happening & wants government to act now

- There is scientific consensus for climate change 62%
 - Republicans 69%
 - Tea Party supporters 58%
 - African-Americans 86%
- Effects happening now 54%
- Willing to assume costs to address climate change 88%
- Believe climate change preparedness create jobs 60%
- **Local government and states should act 82%**

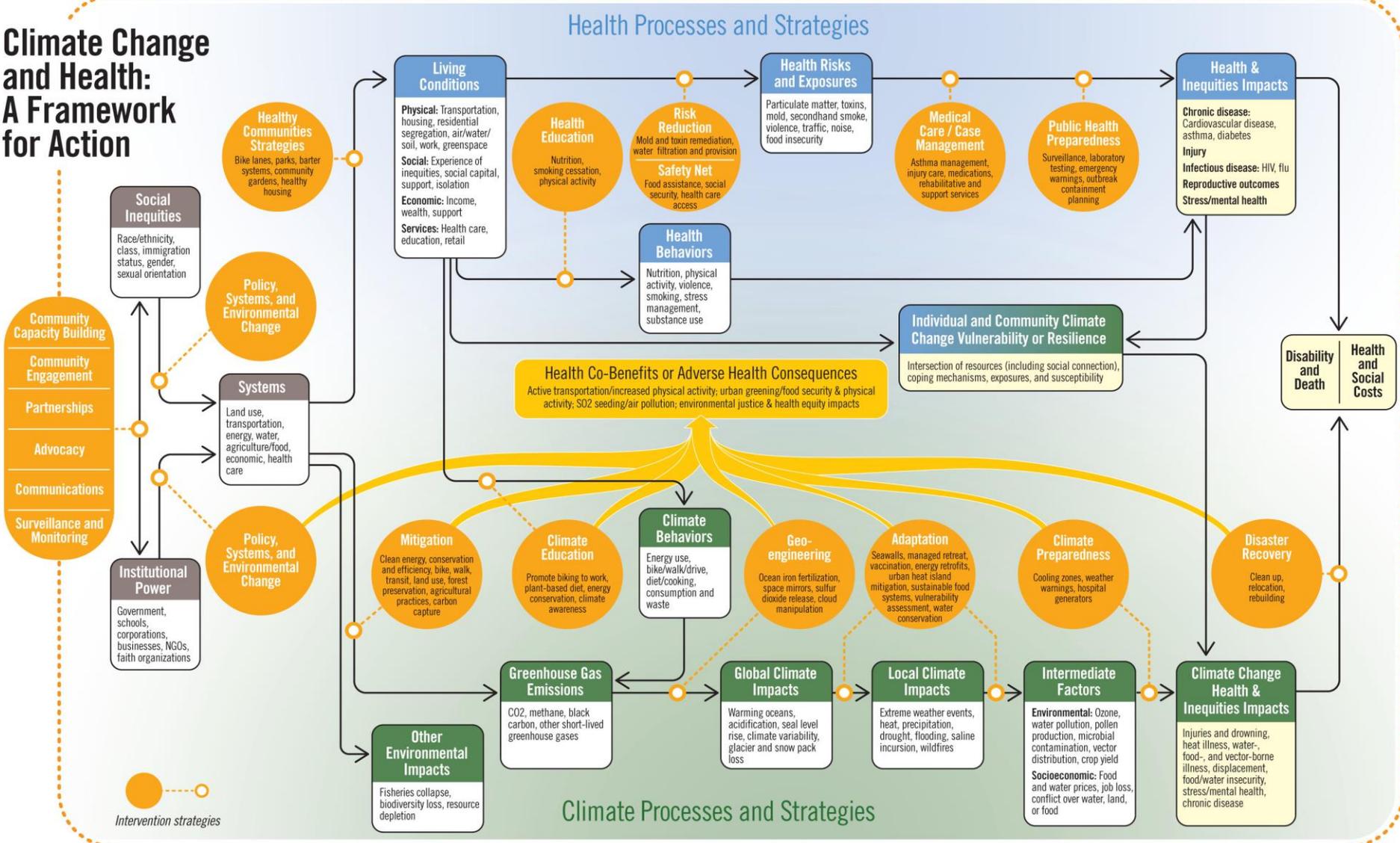
- **Climate change is a public health emergency**
- **It is our professional and moral responsibility to act now.**

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Thank you.

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