


Planning for Public Health Stresses



Outline

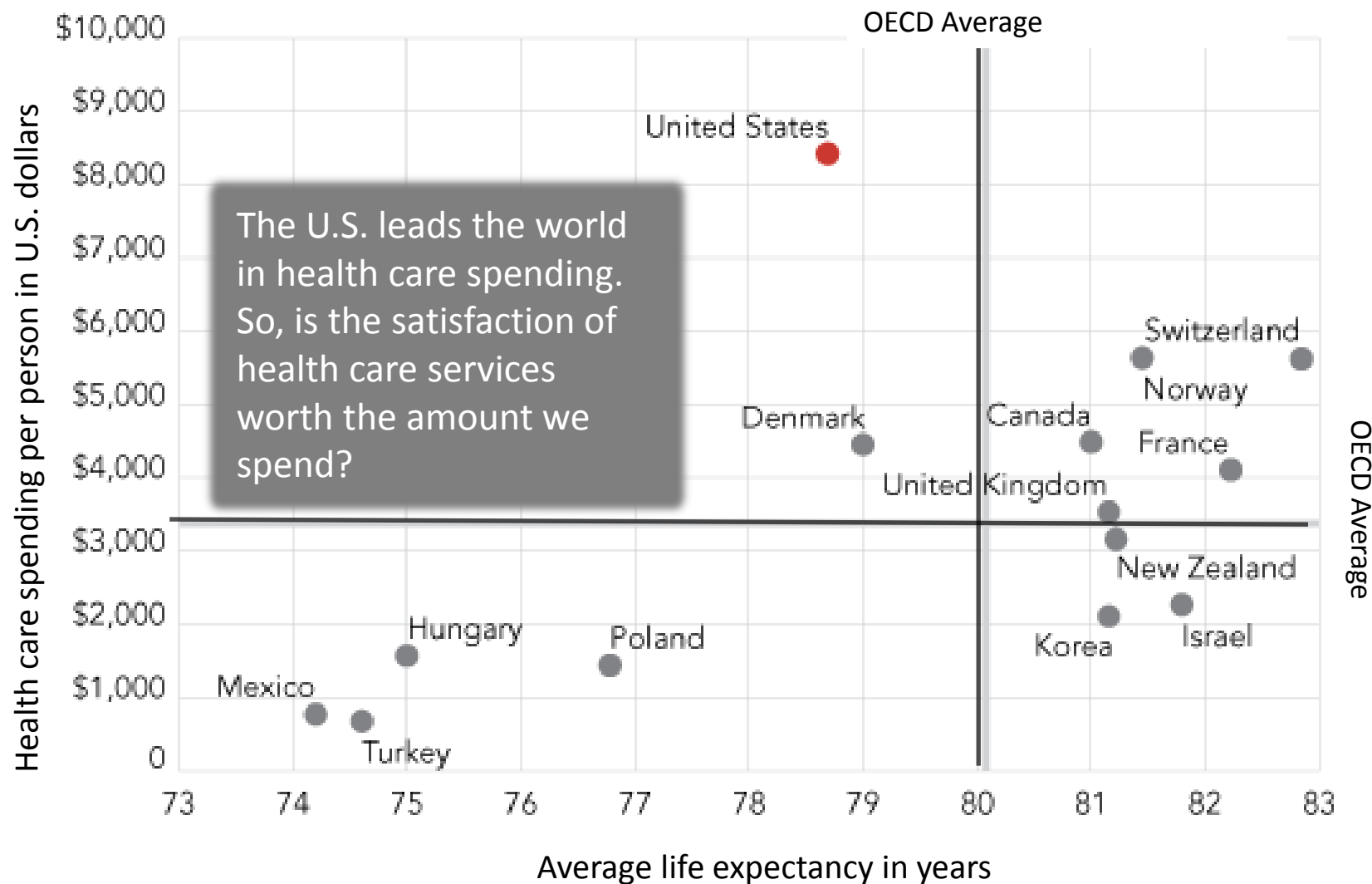
- Public Health in the United States
- Health risks caused by climate change
- Vulnerable populations
- Responding to health challenges





“Public health refers to all organized measures (whether public or private) to prevent disease, promote health, and prolong life among the population as a whole. Its activities aim to provide conditions in which people can be healthy and focus on entire populations, not on individual patients or diseases.”
-World Health Organization

Americans don't live longer than people in countries that spend much less on health care.



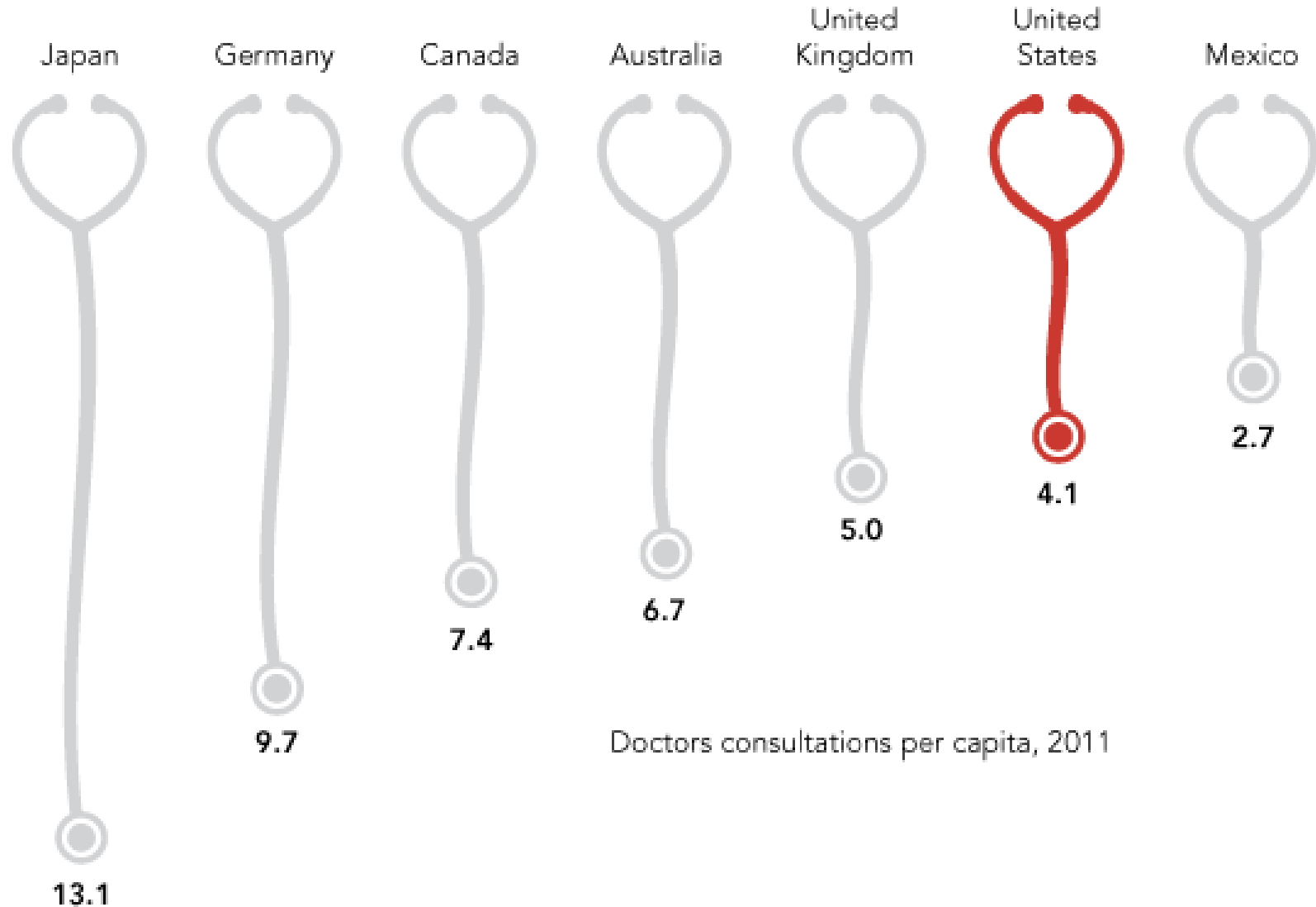
Source: Organization for Economic Co-operation and Development

Where do we rank?

Ranking	Country	Overall Life Expectancy
1	Monaco	87.2
2	Japan	84.6
12	Canada	82.5
14	France	82.3
29	United Kingdom	81
33	Slovenia	80
34	Costa Rica	79.8
35	United States	79.8
36	Chile	79.5
57	Brazil	76.2

Source: World Health Organization

Americans don't go to the doctor very frequently



Doctors consultations per capita, 2011

Our health care is too **Expensive**

Overall Ranking	Country	Ranking based on Expenditure per capita
1	France	4
2	Italy	11
10	Japan	13
37	Costa Rica	37
38	United States	1
39	Slovenia	29

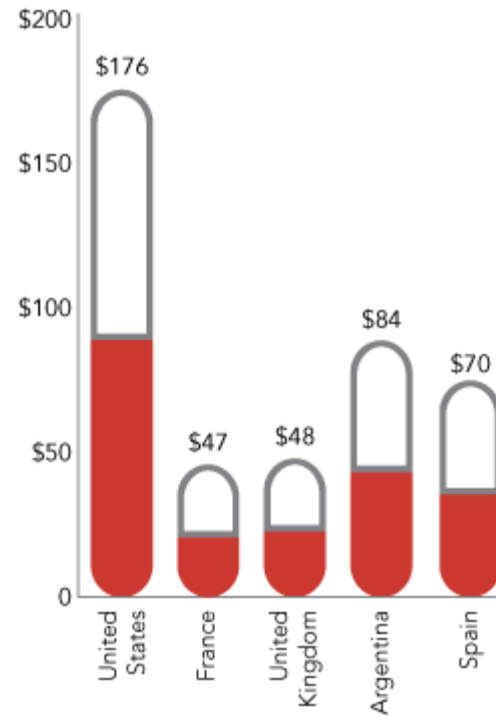
World Health Organization ranking of health systems based on:

- Health
- Responsiveness
- Fair financial contribution

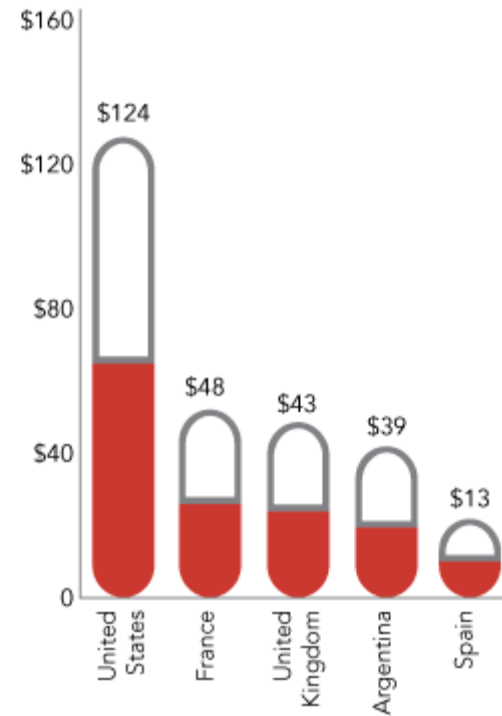
Source: World Health Organization

Commonly prescribed drugs are very expensive in the U.S.

Cymbalta costs 2012

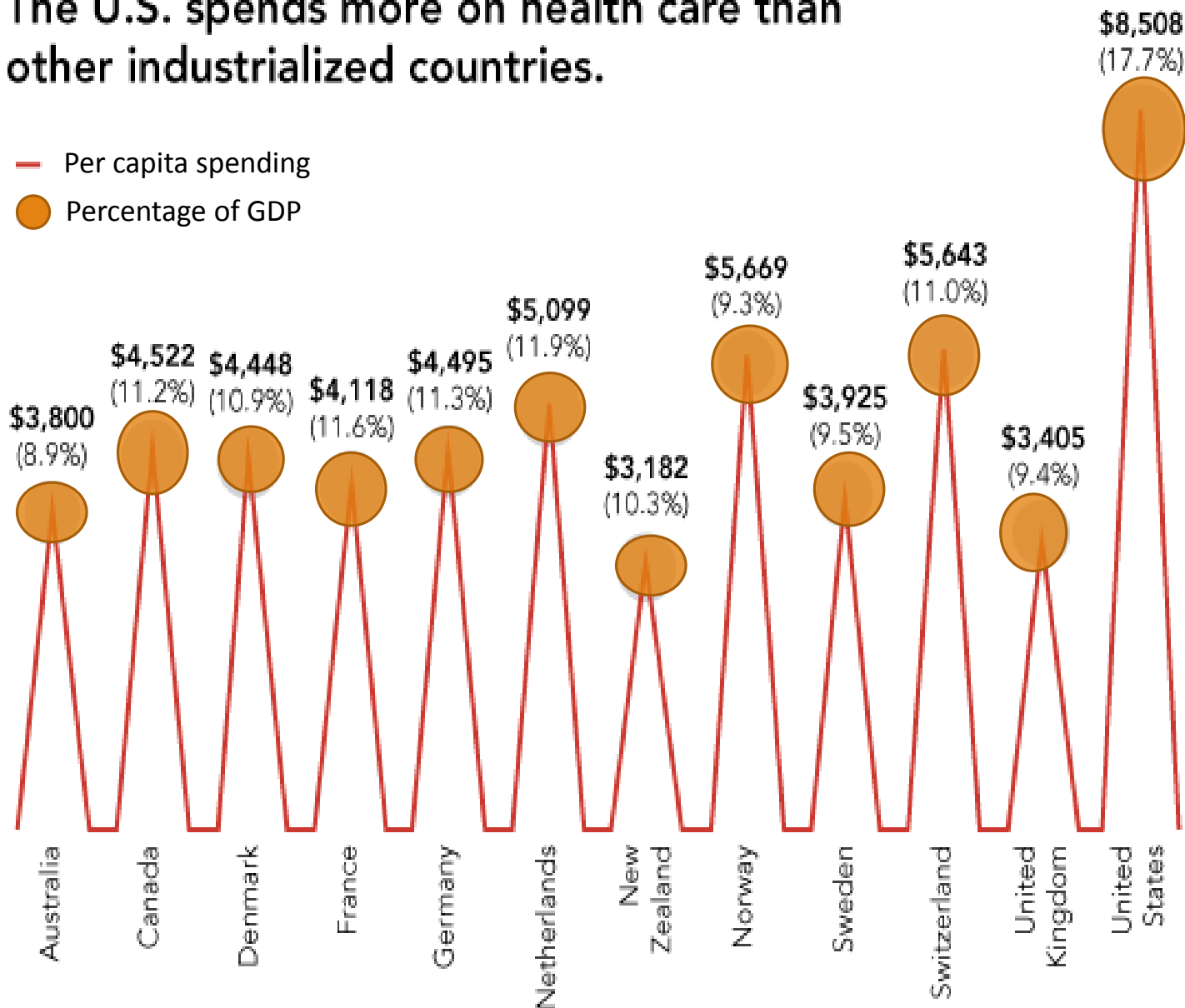


Lipitor costs 2012



Source: Organization for Economic Co-operation and Development

The U.S. spends more on health care than other industrialized countries.



Source: Organization for Economic Co-operation and Development

HEALTH CARE MARKETPLACE

A NEW WAY TO BUY
HEALTH INSURANCE

HEALTHCARE.GOV



#GetCovered

Affordable Care Act (ObamaCare)

ObamaCare's main focus is on providing more Americans with access to affordable health insurance, improving the quality of health care and health insurance, regulating the health insurance industry, and reducing health care spending in the United States.

-ObamaCare Facts



Benefits of ObamaCare:

- New healthcare benefits
- Preventive and wellness services
- Consumer protection
- Cost assistance for Middle-class and small businesses
- Medicaid expansion
- Improvements to Medicare
- Quality over quantity

Source: obamacarefacts.com

Affordable Care Act (ObamaCare)

Cons of ObamaCare:

- Taxes on small businesses
- Religious beliefs
- Rising premiums
- Tax for not having insurance
- Big business taxes
- Taxes on the 2%
- Hurts Medicare
- Increasing debt from ObamaCare



Source: obamacarefacts.com

Affordable Care Act (ObamaCare) vs. Universal Health Care

Universal Health Care

Affordable Care Act

Universal Coverage	Yes. Everyone is covered automatically at birth.	No. About 30 million will still be uninsured in 2022 and tens of millions will remain underinsured.
Full Range of Benefits	Yes. Coverage for all medically necessary services.	No. Insurers continue to strip down policies and increase patients' co-payments and deductibles.
Savings	Yes. Redirects \$400 billion in administrative waste to care; no net increase in health spending.	No. Increases health spending by about \$1.1 trillion over 10 years. Adds further layers of administrative bloat to our health system through the introduction of state-based exchanges.
Cost Control/Sustainability	Yes. Large-scale cost controls (negotiated fee schedule with physicians, bulk purchasing of drugs, hospital budgeting, capital planning, etc.) ensure that benefits are sustainable over the long term.	No. Preserves a fragmented system incapable of controlling costs. Gains in coverage are erased by rising out-of-pocket expenses, bureaucratic waste and profiteering by private insurers and Big Pharma.
Choice of Doctor and Hospital	Yes. Patients will be allowed free choice of their doctor and hospital.	No. Insurance companies continue to deny and limit care and to maintain restrictive networks.
Progressive Financing	Yes. Premiums and out-of-pocket costs are replaced with progressive income and wealth taxes. 95 percent of Americans will pay less for care than they do now.	No. Continues the unfair financing of health care whereby costs are disproportionately paid by middle- and lower-income Americans and those families facing acute or chronic illness.

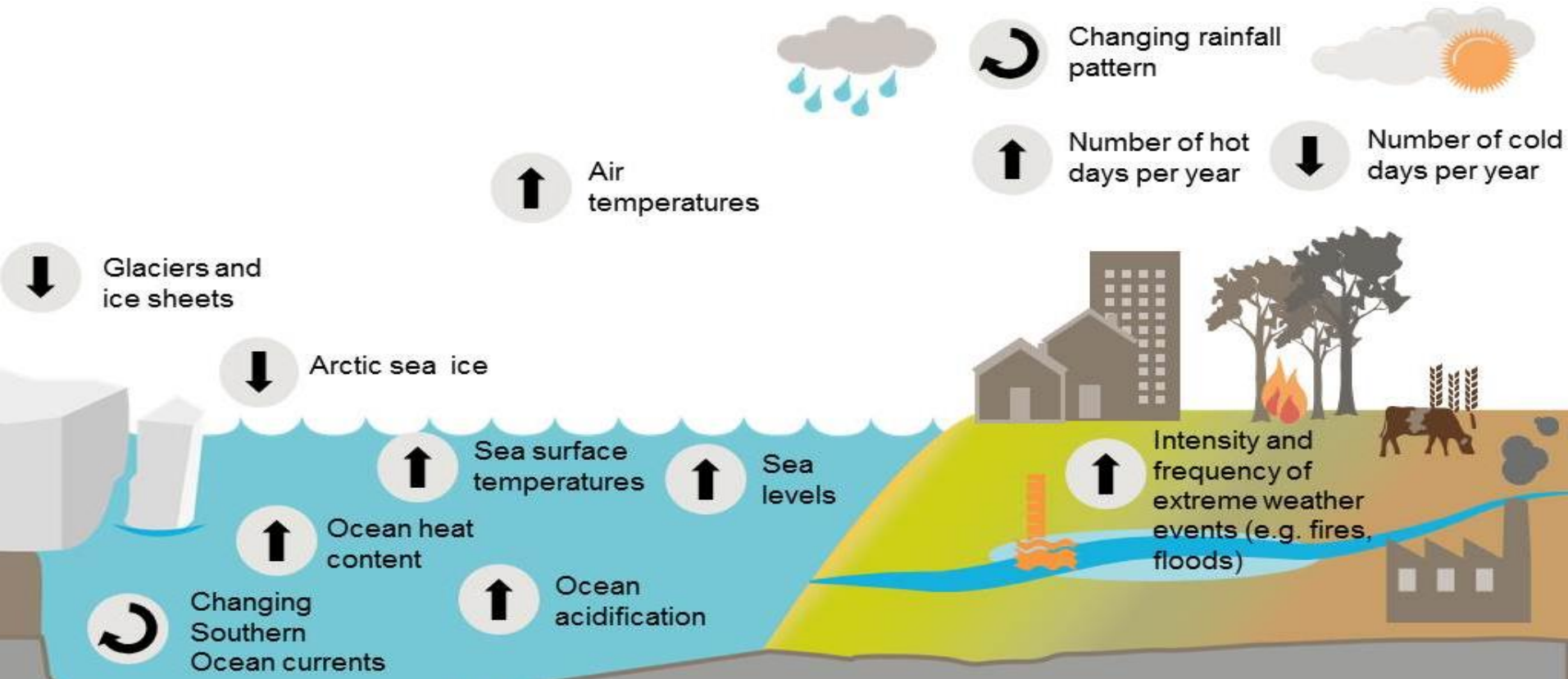
WWW.PNHP.ORG | INFO@PNHP.ORG

San Diego's Largest Public Health Risks



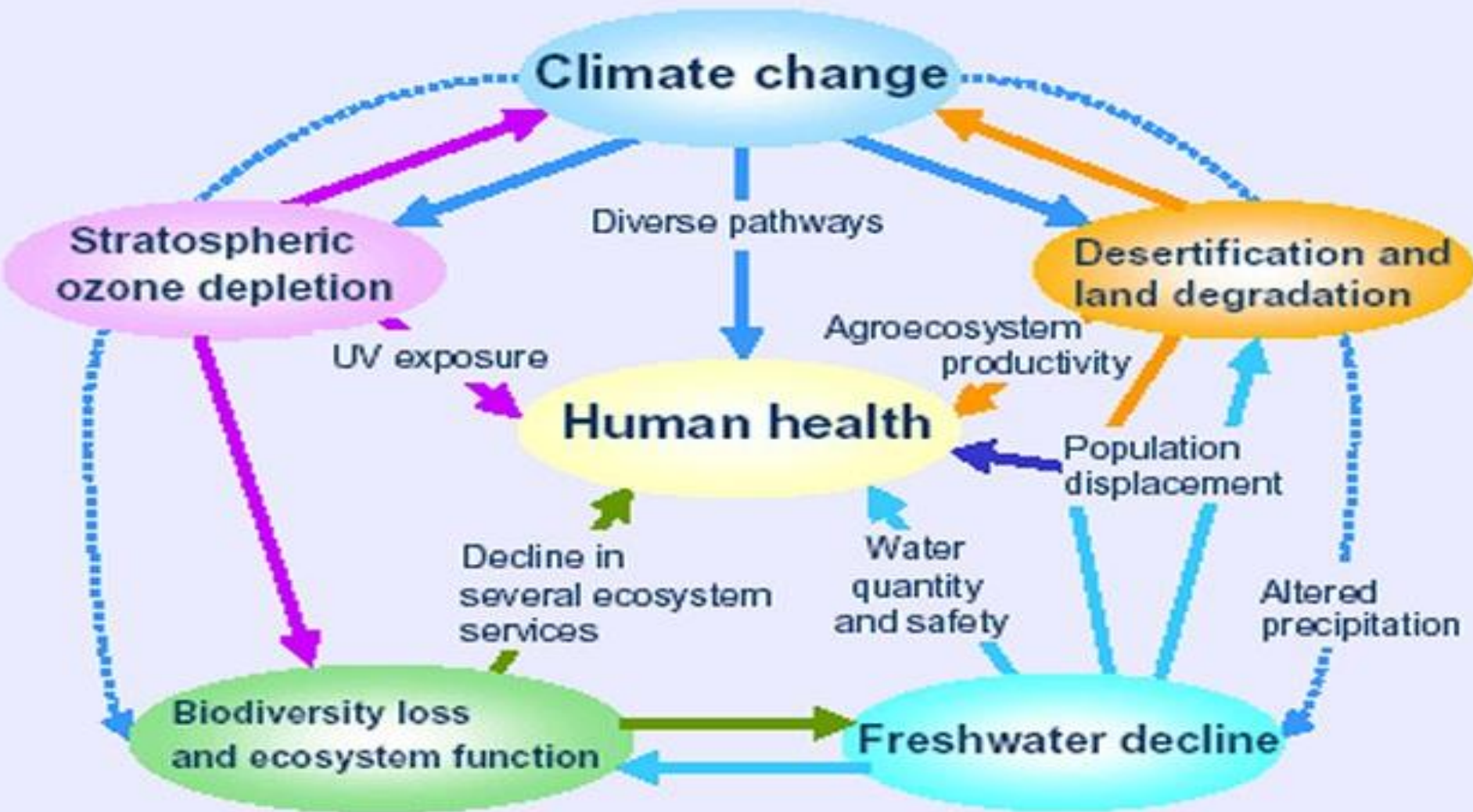
Climate change

There are multiple lines of evidence that show the climate system is changing



Source: Australian Government: Department of the Environment

Climate Change



Source: Elements: Environmental Health Intelligence

Risk: Air Pollution

	MAJOR SOURCES	HEALTH EFFECTS	ENVIRONMENTAL EFFECTS
SO₂	Industry	Respiratory and cardiovascular illness	Precursor to acid rain, which damages lakes, rivers, and trees; damage to cultural relics
NO_x	Vehicles; industry	Respiratory and cardiovascular illness	Nitrogen deposition leading to over-fertilization and eutrophication
PM	Vehicles; industry	Particles penetrate deep into lungs and can enter bloodstream	Visibility
CO	Vehicles	Headaches and fatigue, especially in people with weak cardiovascular health	
Lead	Vehicles (burning leaded gasoline)	Accumulates in bloodstream over time; damages nervous system	Fish/animal kills
Ozone	Formed from reaction of NO _x and VOCs	Respiratory illness	Reduced crop production and forest growth; smog precursor
VOCs	Vehicles; industrial processes	Eye and skin irritation; nausea; headaches; carcinogenic	Smog precursor

Source: U.S EPA

Risk: Air Pollution

Air

Roughly 40% of the U.S.'s total emissions (2.2 billion tons of Carbon Dioxide) come from electric power plants.

Source: NRDC



Toxic air contaminants:

Known or suspected to cause cancer or other serious health effects.

Examples:

Benzene- in gasoline

Perchloroethylene- emitted from some dry cleaning facilities

Methylene Chloride- frequently used solvent and paint stripper

Source: San Diego Air Pollution Control District

Risk: Air Pollution in San Diego

Motor vehicles are San Diego's leading source of air pollution and the largest contributor to greenhouse gases. San Diego's 3.1 million residents own **2.3 million vehicles**, collectively, and drive about **87 miles each day**

Source: San Diego Air Pollution Control District



Source: Los Angeles Times

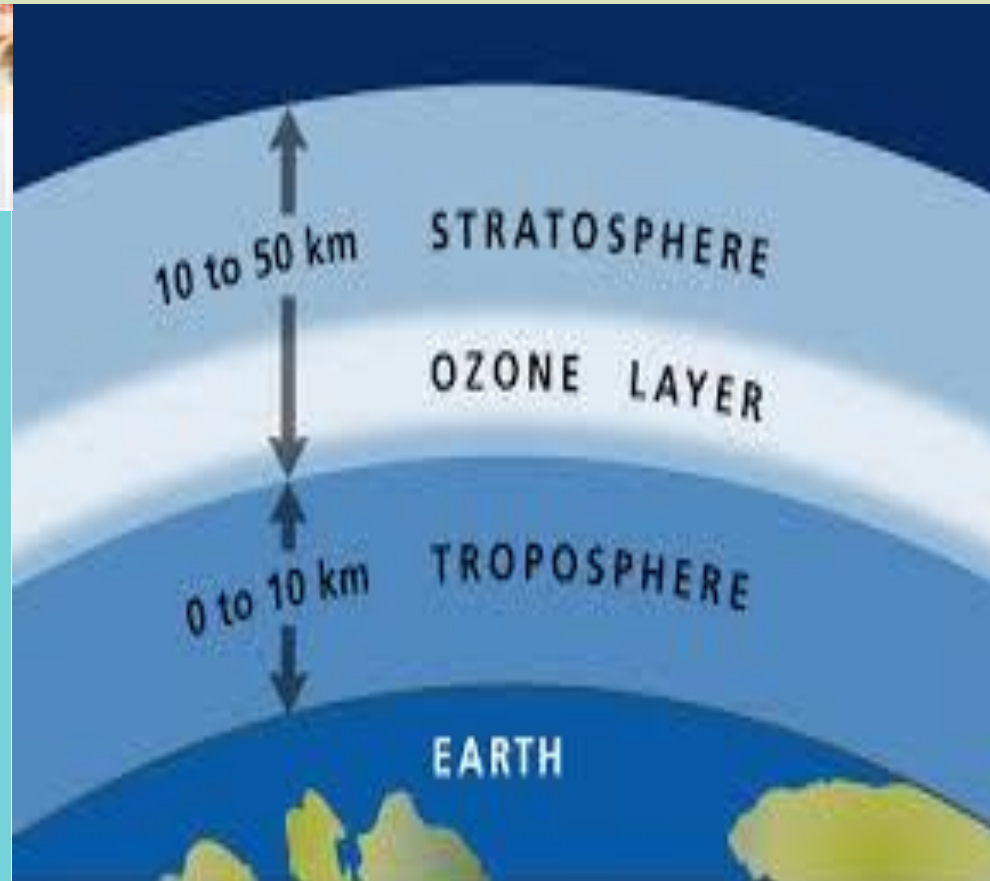
Risk: Air Pollution-San Diego Ozone

Ozone: A colorless gas composed of three oxygen atoms, produced naturally in Earth's upper atmosphere forming a protective layer against UV rays. It is also a main component of urban smog.



Facts:

- Ozone is harmful to breathe at ground level
- Ozone can irritate the respiratory system, reduce lung function and damage lung lining and intensify asthma
- A stage I ozone episode is a smog alert, when levels reach 20 ppm
- A stage II ozone episode occurs when ozone levels reach 35 ppm



Risk: Heat Stress

It turns out that **cities** experience a much greater health impact than rural and suburban areas because air pollution already exists in cities, which in turn heightens the extremity of heat waves that reach these regions

San Diego is expected to experience more days of extreme high temperatures each year, and heat waves could be longer and more humid with less cooling at night.

Source: University of San Diego

“Daily numbers of deaths increase during very hot weather in temperate regions”

Source: IPCC



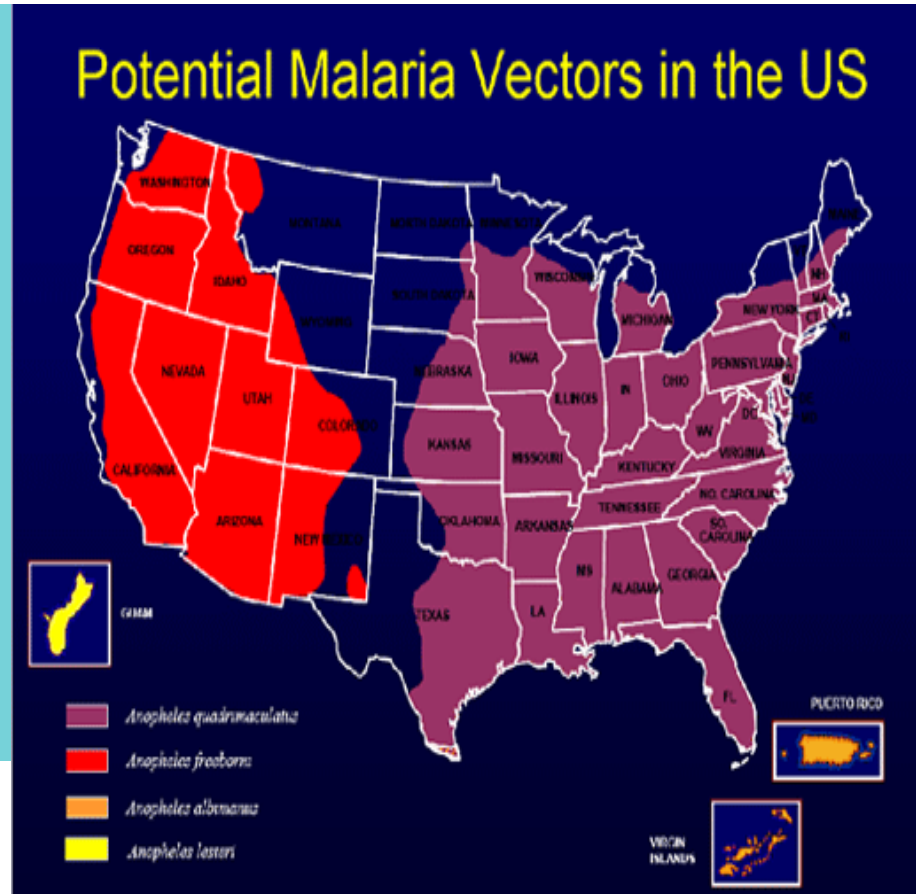
Symptoms of heat stress:

- Dizziness
- Headache
- Weakness
- Rapid Heartbeat
- Nausea
- Cramps
- Chest Pain
- Labored breathing

Source: Capital Tristate

Risk: Spread of Insect Transmitted Diseases

As the Earth heats and rainfall patterns shift, vectors that thrive in warm, tropical regions will begin to expand their horizons and come to new places that have been recently warmed to their liking.



Source: Citizendium.org

This means that regions and communities that are not used to having to protect themselves from disease, especially foreign ones, now have to protect themselves.

Vector: an organism, typically a biting insect or tick, that transmits a disease or parasite from one animal or plant to another. Source: Oxford Dictionaries

Risk: Spread of Insect Transmitted Diseases

Dengue Fever-An acute infectious disease transmitted by aedes mosquitos, and characterized by headache, severe joint pain, and rash.

West Nile Virus- Causes an illness marked by fever, headache, muscle ache, skin rash, and sometimes encephalitis or meningitis and that is spread especially from birds to humans by mosquitoes.

Source:

Encephalitis-
Inflammation of the brain usually caused by a direct viral infection or a hypersensitivity to reaction to a virus or foreign protein.

Source: Medical Dictionary-
The Free Dictionary by Farlex

Source: Merriam-Webster Dictionary

Malaria-A serious disease that causes chills and fever that is passed from one person to another by the bite of mosquitoes.

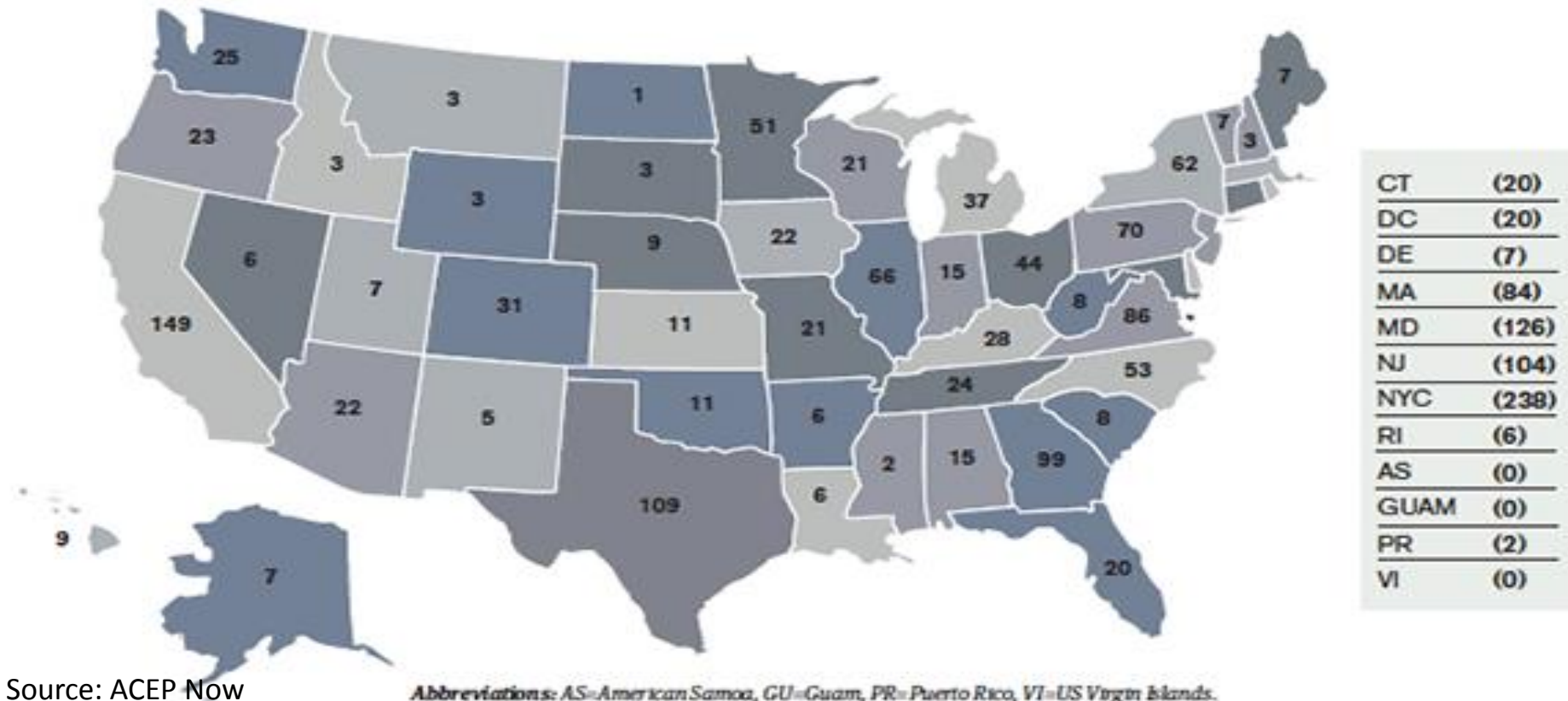


Risk: Spread of Insect Transmitted Diseases

Two most common insect transmitted diseases in San Diego County are encephalitis and malaria, both carried by mosquitos.

Source: County of San Diego

149 Cases of Malaria in California have been recently recorded, taking second place after NYC.



Source: ACEP Now

Risk: Drought



- San Diego draws from watersheds that are nearly 100% affected by drought.
- All of California is in exceptional drought, the largest within the last 150 years

Source: City of San Diego

Possible public health implications of drought:

- Compromised quantity and quality of drinking water
- Increased recreational risks
- Effects on air quality
- Diminished living conditions related to energy, air quality, sanitation and hygiene
- Compromised food and nutrition
- Increased incidence of illness and disease

Source: CDC (Centers for Disease Control and Prevention)

Between 85- 90% of San Diego's drinking water comes from Colorado River and Northern California (is imported), while only 10% comes from local rainfall.

Source: City of San Diego

Risk: Wildfires

Possible public health implications of Wildfires:

- Heat induced illness
- Respiratory Symptoms
- Burns
- Water and Land Pollution

Wildfire smoke itself can cause:

- Scratchy throat
- Coughing
- Irritated sinuses
- Shortness of breath
- Chest Pain
- Headaches
- Stinging Eyes
- A runny nose
- Asthma exacerbations

Source: CDC



VULNERABLE POPULATIONS

*COMMUNITIES IN SAN DIEGO COUNTY THAT
ARE MOST SUSCEPTIBLE TO CLIMATE
CHANGE*

FACTORS OF VULNERABILITY

Age

- Elderly (65+ yrs.)
- Children (0-7 yrs.)

Pre-existing illnesses

- Respiratory diseases
- Cardiovascular diseases

Low socioeconomic status (SES)

Location

- Coastal communities
- Industrial zones & freeways

Frequent outdoor activity

- Athletes
- Outdoor workers

County	Total Population	Children under 18	Adults over 65	Pediatric Asthma
San Diego	3,177,063	726,268	380,276	63,708

Adult Asthma	COPD	Heart Disease	Diabetes	Poverty
215,294	111,464	158,275	233,550	465,651

(American Lung Association)

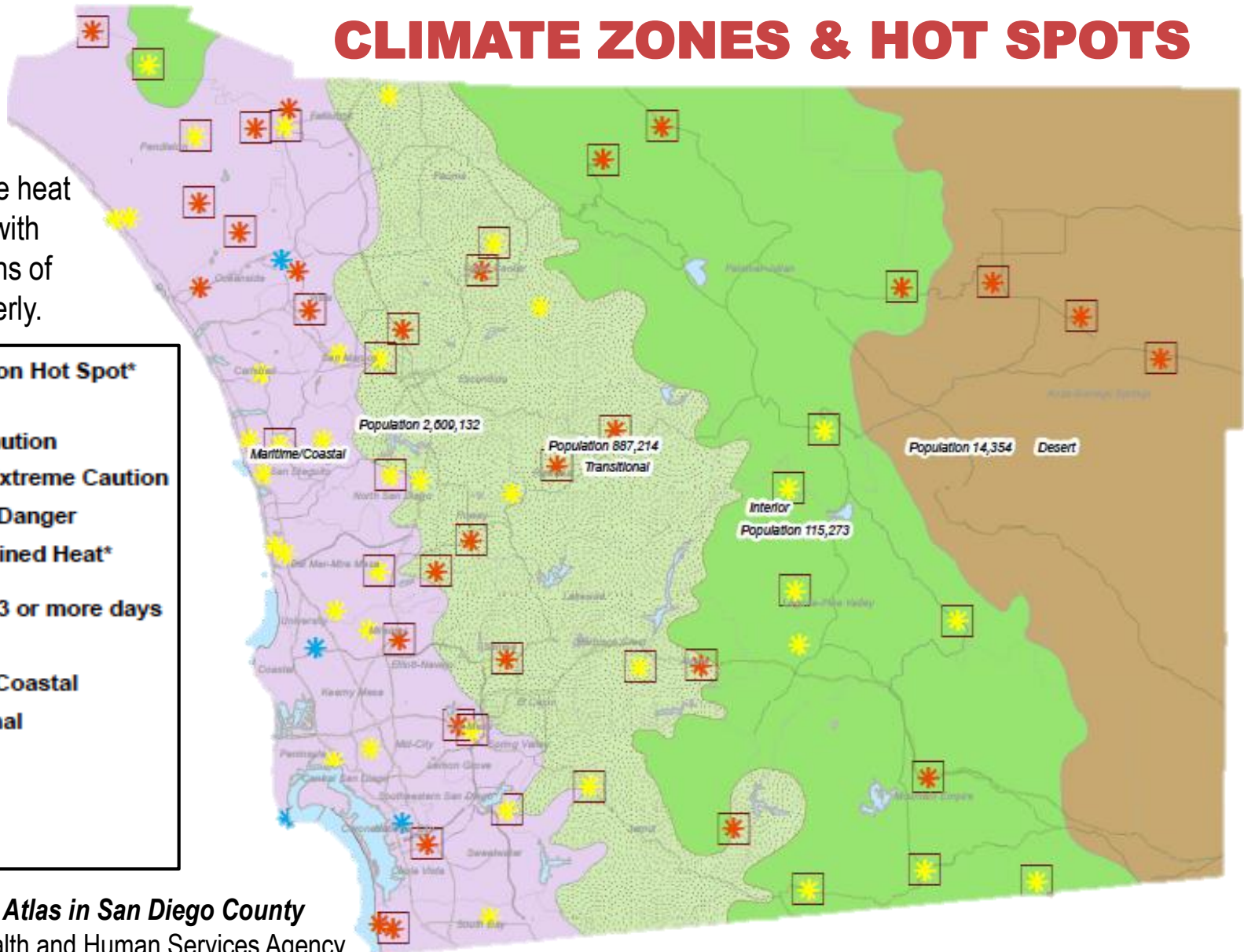
GENERAL CLIMATE CHANGE IMPACTS & EFFECTS TO HEALTH

WEATHER EVENT	HEALTH EFFECTS	POPULATIONS MOST AFFECTED
Heat waves	Heat stress	Extremes of age, athletes, people with respiratory disease
Extreme weather events (rain, hurricane, tornado, flooding)	Injuries, drowning, mass population movement	Coastal, low-lying land dwellers, low SES, elderly, children
Droughts, floods, increased mean temperature	Vector - food - and water-borne diseases, food and water shortages, malnutrition	Multiple populations at risk, low SES, elderly, children
Sea-level rise	Injuries, drowning, water and soil salinization, ecosystem and economic disruption	Coastal, low SES
Increases in ground-level ozone, airborne allergens, and other pollutants	Respiratory disease exacerbations (COPD, asthma, allergic rhinitis, bronchitis)	Elderly, children, those with respiratory disease
Climate change generally; extreme events	Mental health	Young, displaced, agricultural sector, low SES

(Center for Disease Control)

SAN DIEGO COUNTY CLIMATE ZONES & HOT SPOTS

Potential danger zones of extreme heat to communities with dense populations of children and elderly.

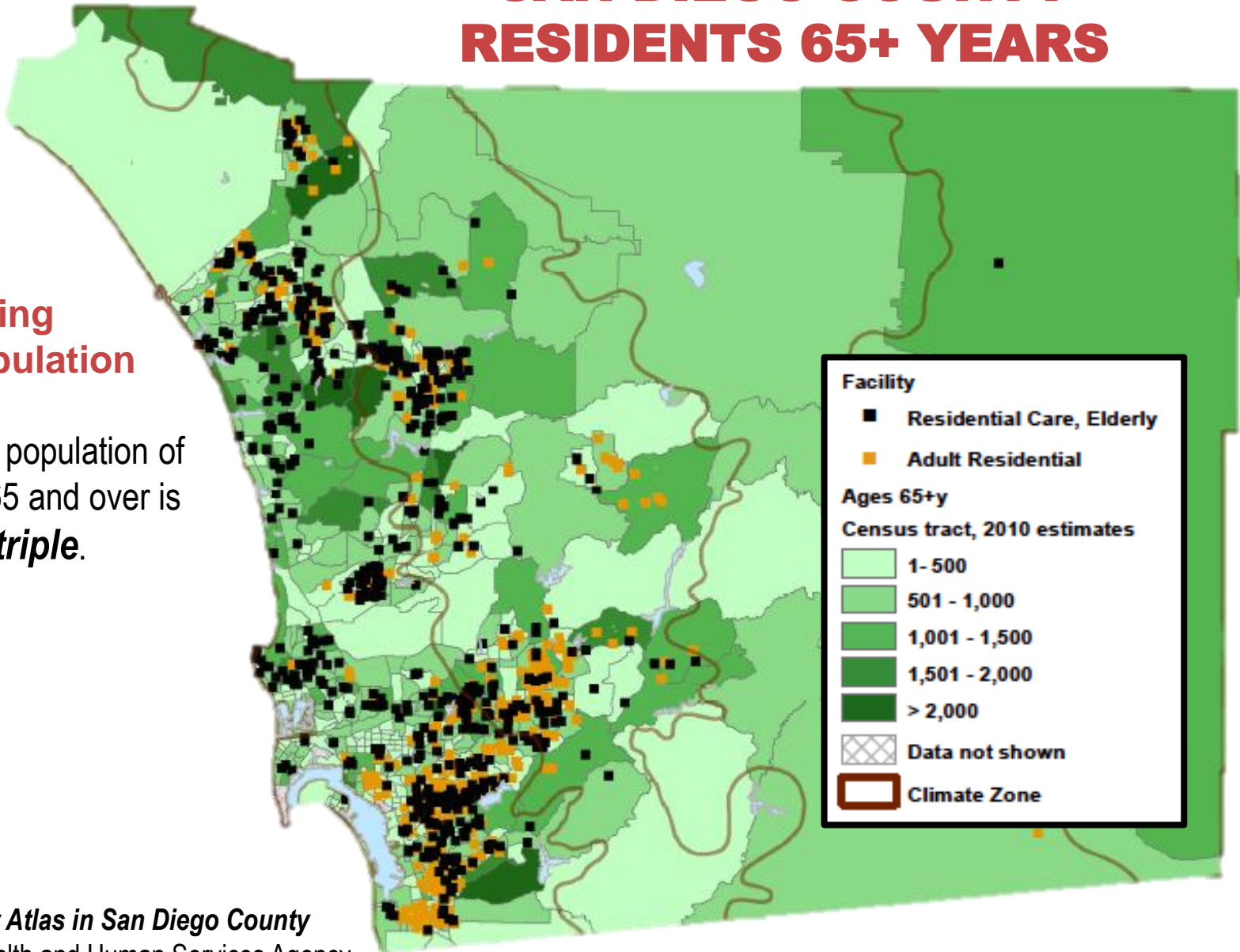


Heat Vulnerability Atlas in San Diego County (August 2012) Health and Human Services Agency

SAN DIEGO COUNTY RESIDENTS 65+ YEARS

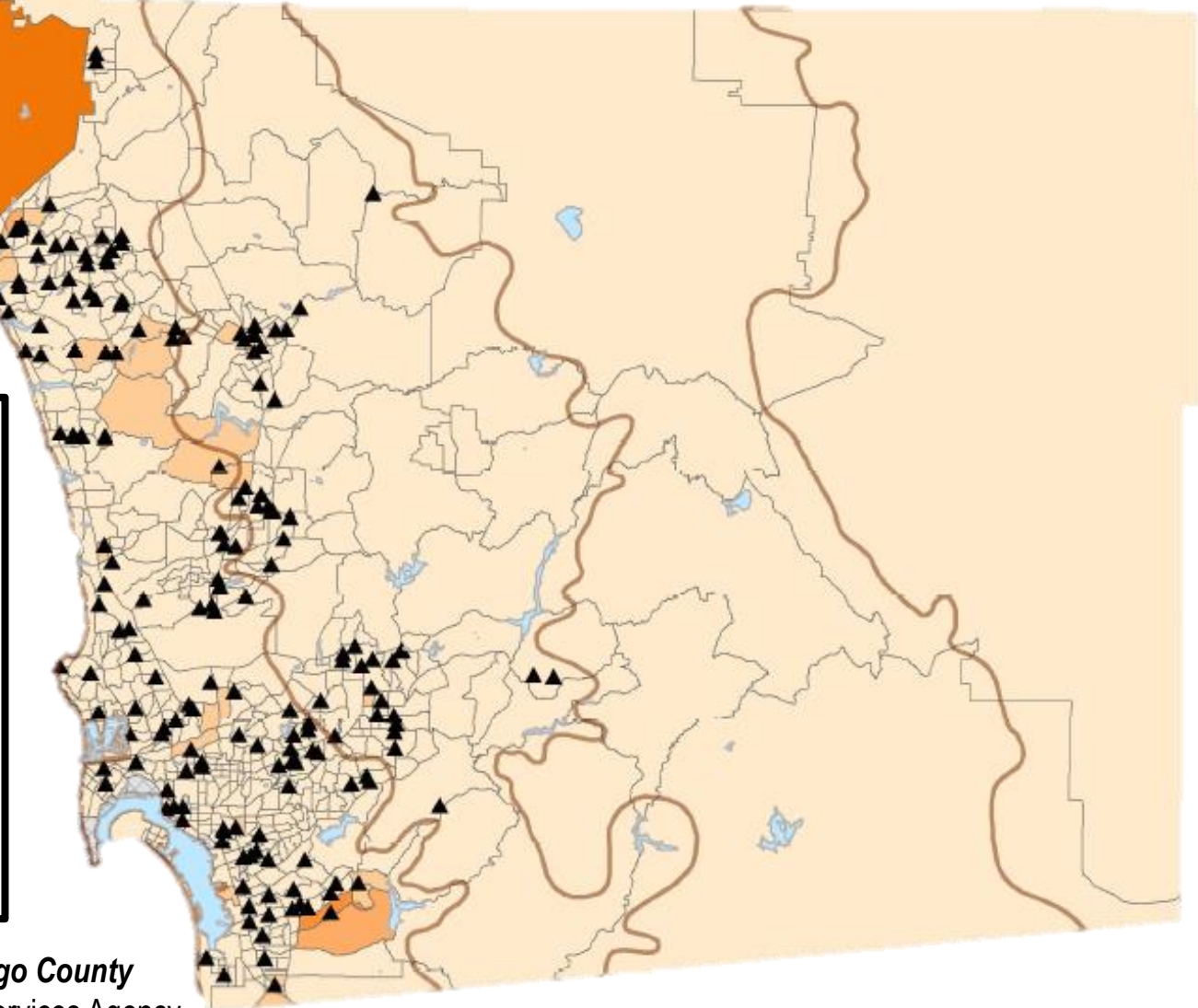
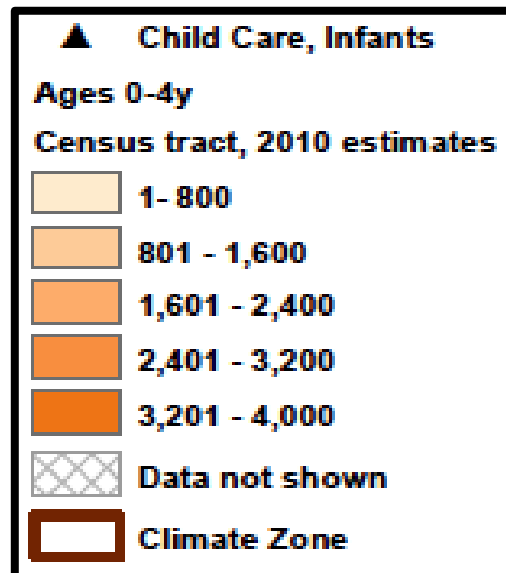
The Growing Aging Population

By 2030, the population of those aged 65 and over is projected to **triple**.



Heat Vulnerability Atlas in San Diego County
(August 2012) Health and Human Services Agency

SAN DIEGO COUNTY RESIDENTS 0-4 YEARS OF AGE

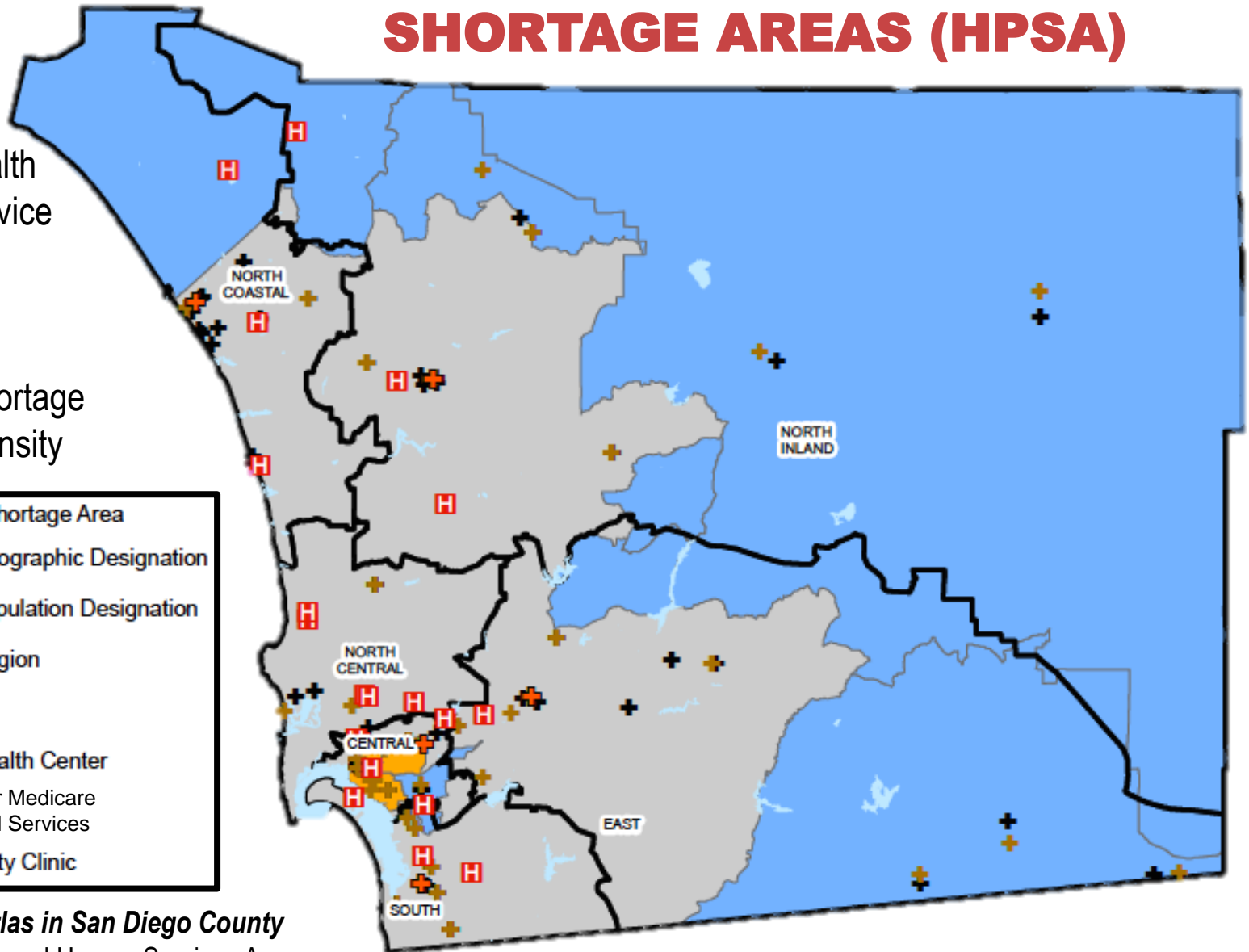


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HEALTH PROFESSIONAL SHORTAGE AREAS (HPSA)

Geographic: Shortage in Health and Human Service Agency (HHSA) service area

Population: Shortage in population density



Heat Vulnerability Atlas in San Diego County
(August 2012) Health and Human Services Agency

PRE-EXISTING ILLNESSES

“San Diego County is currently a *marginal nonattainment* area for the National Air Quality Standard of for ozone.”

- *Air Quality in San Diego 2013 Annual Report* by Air Pollution Control District

Higher temperatures increase ground-level ozone levels

➤ Increased health risk for the with *respiratory diseases*

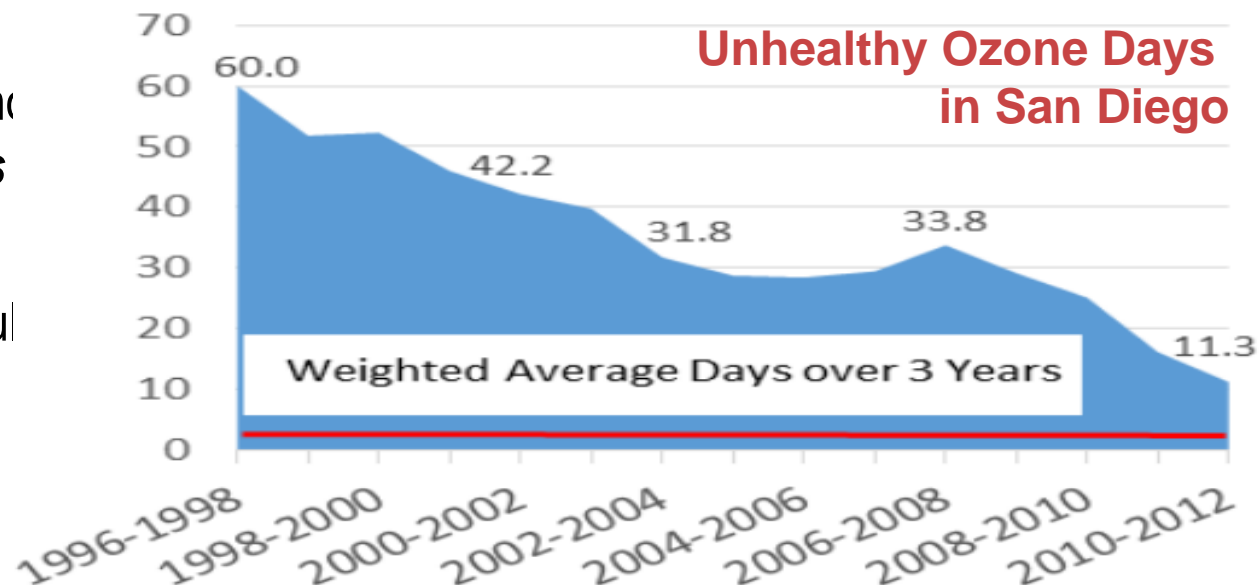
Since 1996, ozone and particulate pollution in San Diego has significantly decreased.

(*American Lung Association*)

Good (0-50)	Moderate (61-75)	Unhealthy for Sensitive Groups (101-150)	Unhealthy (151 – 200)	Very unhealthy (201-300)
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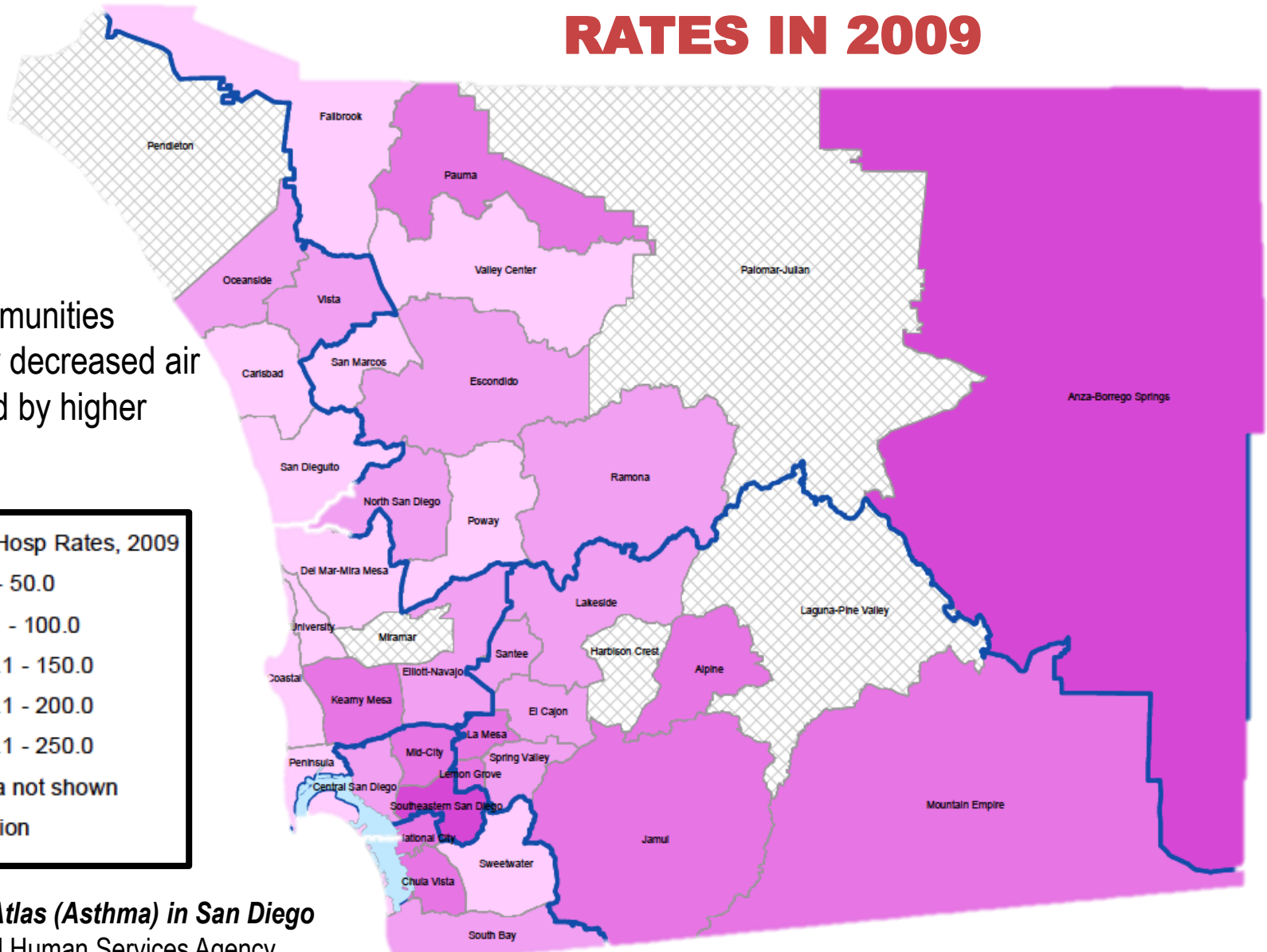
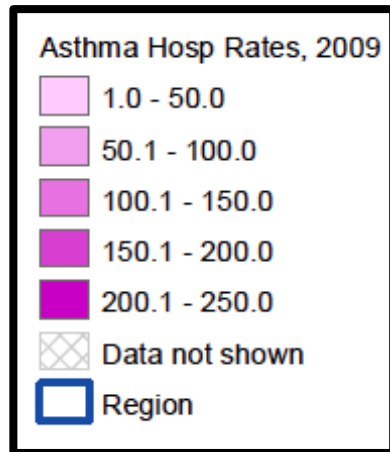


See hourly combined AQI, Ozone, and PM2.5 conditions at airnow.gov



ASTHMA HOSPITALIZATION RATES IN 2009

Potential communities threatened by decreased air quality caused by higher temperatures.



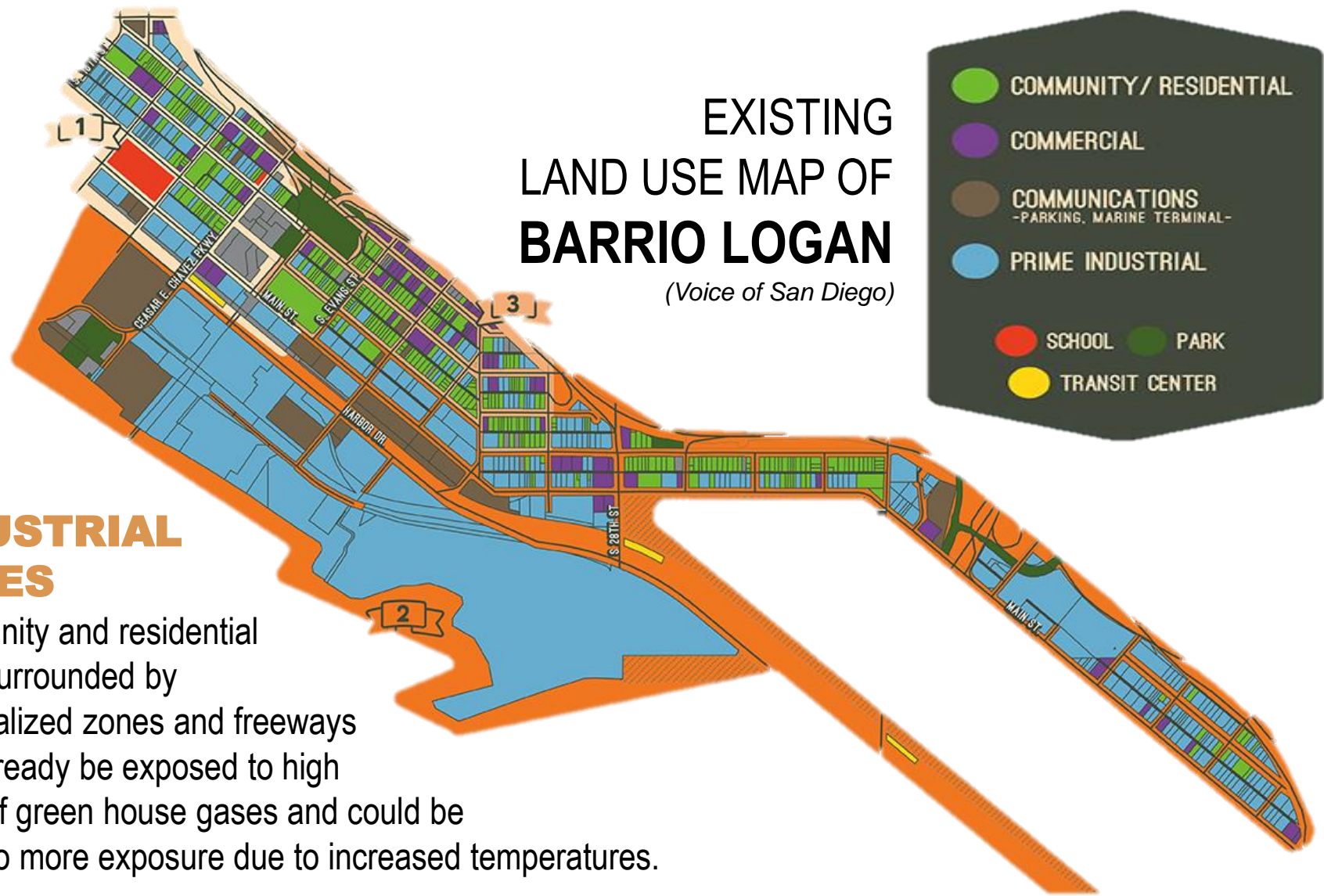
Chronic Disease Atlas (Asthma) in San Diego County, Health and Human Services Agency

LOCATION: INDUSTRIAL ZONES

EXISTING LAND USE MAP OF BARRIO LOGAN

(Voice of San Diego)

- COMMUNITY / RESIDENTIAL
- COMMERCIAL
- COMMUNICATIONS
-PARKING, MARINE TERMINAL-
- PRIME INDUSTRIAL
- SCHOOL
- PARK
- TRANSIT CENTER



INDUSTRIAL ZONES

Community and residential areas surrounded by industrialized zones and freeways may already be exposed to high levels of green house gases and could be at risk to more exposure due to increased temperatures.

LOCATION: HEAVY TRAFFIC ROADWAYS

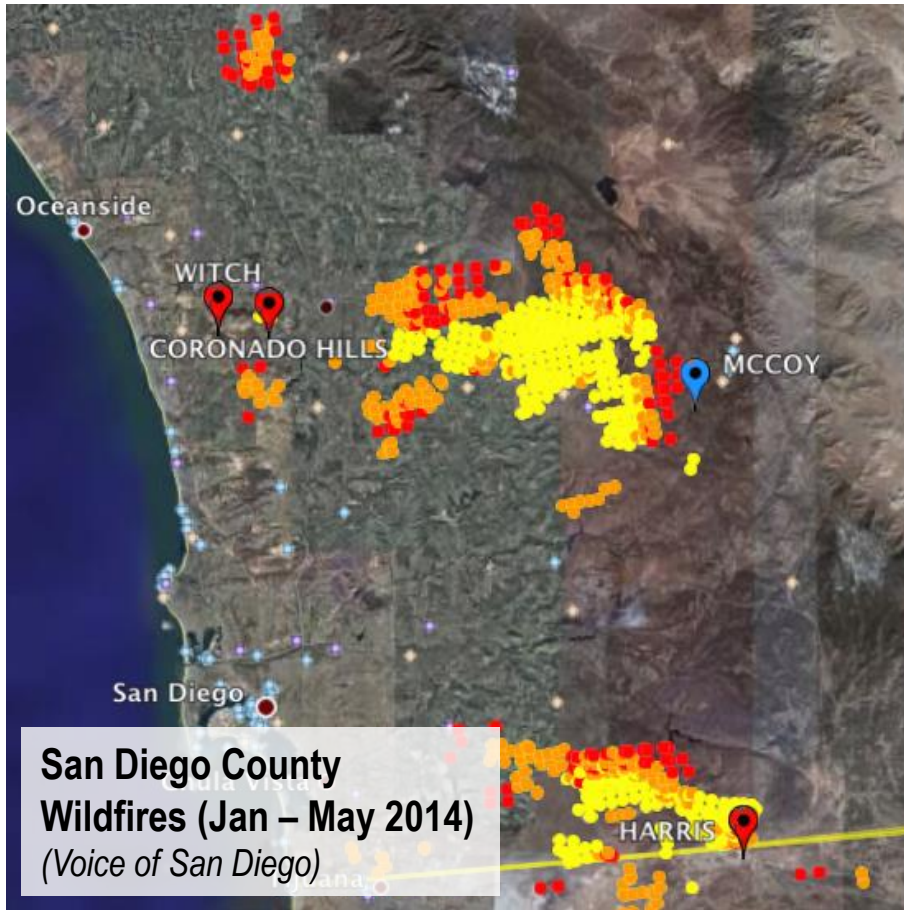
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VOCs	Vehicles; industrial processes	Eye and skin irritation; nausea; headaches; carcinogenic	Smog precursor

(National Ambient Air Quality Standards, EPA)



Higher temperatures can increase the risk of these health effects in communities frequently exposed to the listed pollutant sources – especially areas near heavy traffic freeways & roadways.

LOCATION: WILDFIRES



Areas that experience frequent wildfires are at risk to health effects from the exposure of smoke and CO₂.



Travelling smoke and debris affect areas outside of the immediate wildfire locations.

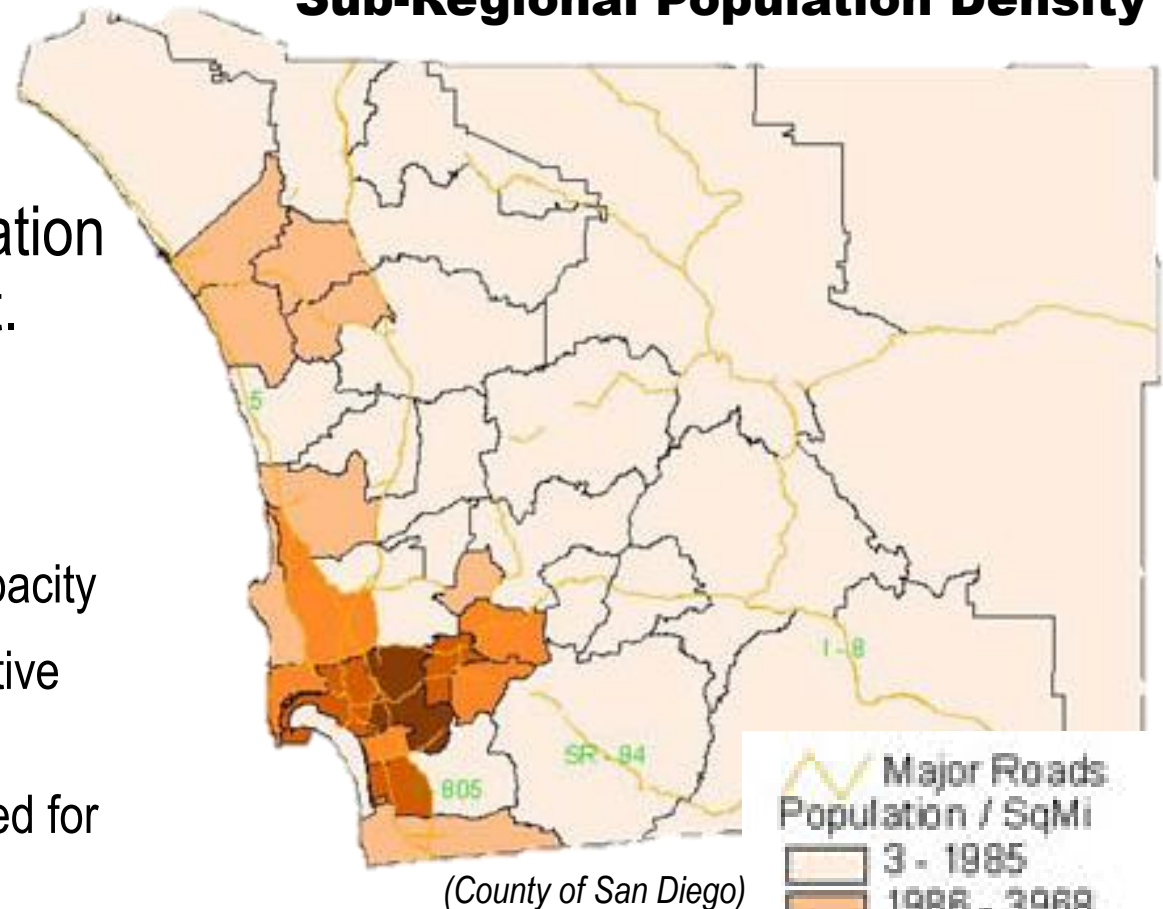
LOCATION: COASTAL REGIONS

San Diego County Sub-Regional Population Density

Most of San Diego's population live near or along the coast.

Disadvantages for Coastal Communities:

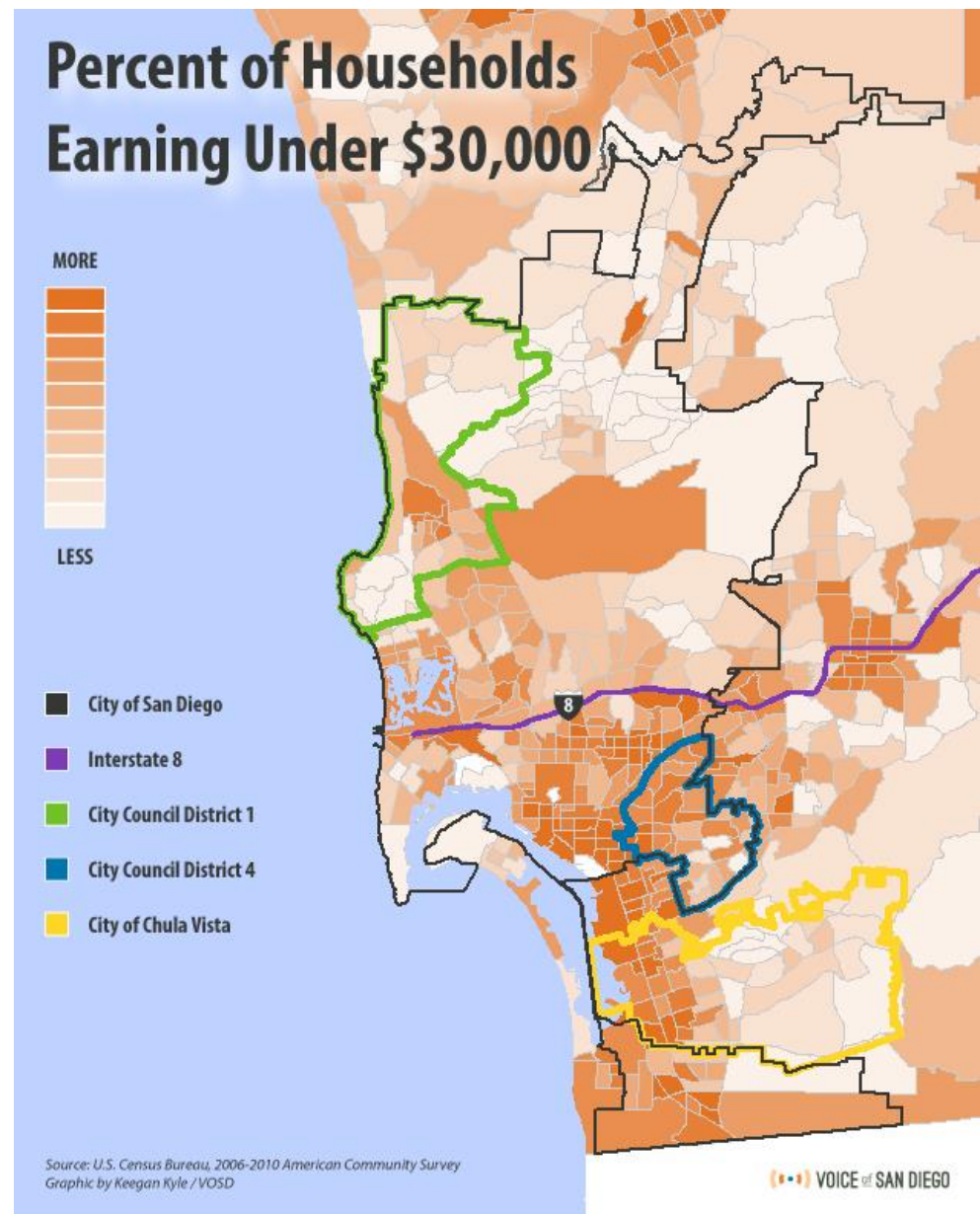
- Less physiological adaptive capacity
- Less aware of the risk & protective behaviors
- Built environment is not designed for warmer conditions
 - Less than 52% of San Diego's overall population have air conditioning



(Climate Change Public Health Impacts Assessment & Response Collaborative)

STRESSES TO LOW SOCIO- ECONOMIC HOUSEHOLDS

- Cost of health care services apply stress to low income households
- Increased overall energy demand may increase energy costs for households
- Households eligible for energy utility financial assistance programs may be more at risk of not utilizing cooling appliances due possible higher energy costs.



(U.S. Census Bureau 2006-2010)

ARE WE READY FOR THE COSTS?

“Californians experience the worst air quality in the nation, resulting in yearly economic costs of approximately \$71 billion (\$36–\$136 billion), with about **\$2.2 billion (\$1.5–\$2.8 billion) associated with hospitalizations and medical treatment of illnesses related to air pollution exposure.”**

- California Climate Change Center

WHERE ARE THE COSTS?

Increased demand for water from drought

Increased energy demand from:

- The need for more cooling centers
- Increased air conditioner use in residential and commercial buildings

Increased health care demands from:

- Increased stress on public health services
- The need for more services in vulnerable areas

More timely action is required to prepare our vulnerable populations from climate change risks as procrastination may lead to higher costs.

What actions should we take?

Responding to Health Challenges

Posed by climate change impacts

Cross-disciplinary Approach

- Multiple strategies are needed to help communities build resistance to and resiliency against the impacts of climate change in regards to public health.

- Approaches will incorporate:
 - health care
 - land use
 - transit
 - agriculture
 - infrastructure
 - traditional community-based structures of support including families, neighbors, and voluntary organizations



Source: One Health

Essential Partnerships



- Stakeholders

- Federal, **state**, and **local** government agencies
- Academia
- Private Sector
- NGO's
- **Public Citizens**



Need new collaborations with:

- Architects and city planners (reduce energy demand, limit vulnerability to climate risks)
- Transportation planners (reduce GHG emissions, promote safe, healthy travel)

Preparing for Extreme Heat



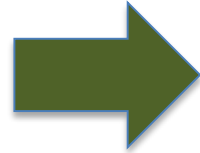
- Refine California Heat Contingency Plan to specifically fit San Diego
 - Identify and implement heat adaptation strategies with health co-benefits
- Increase health care system's extreme heat preparedness and "surge capacity"



- Improve Heat-Health Alert Warnings
- Improve access to cooling centers
 - Provide transportation
- Ensure back-up energy sources for cooling centers
- Educate vulnerable populations on how to be prepared for extreme heat

Urban Heat Islands

Identification
of urban heat
islands



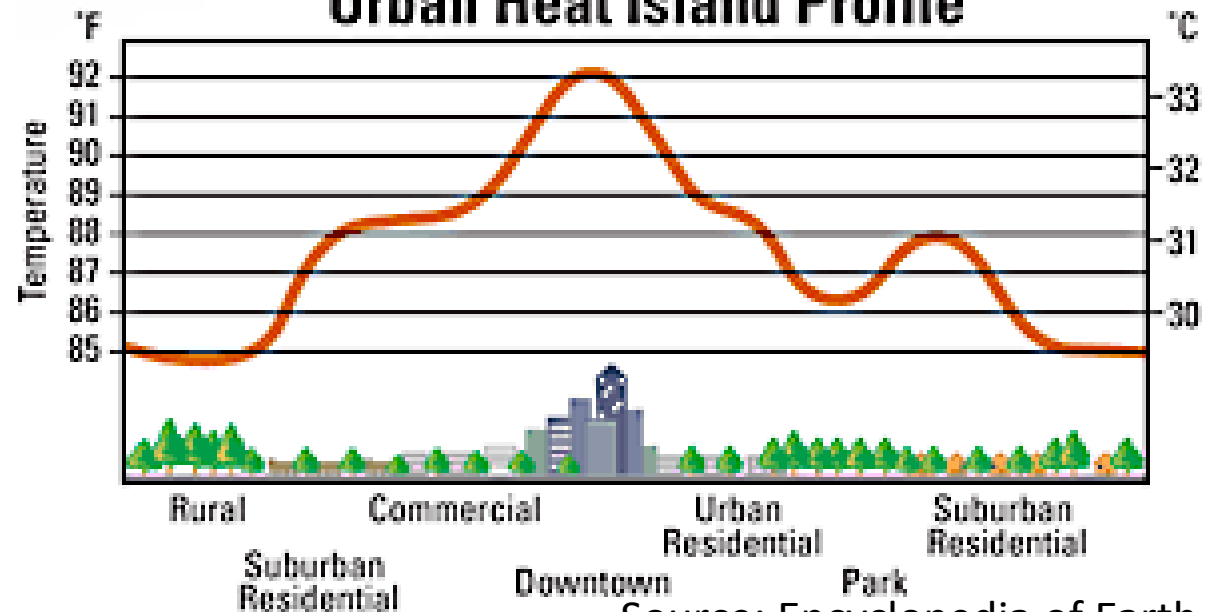
Targeted efforts to
increase shading
and heat-reflective
pavements/roofing

City Recommendation

Create a urban heat
island effect index

- set quantifiable
goals for heat
reduction

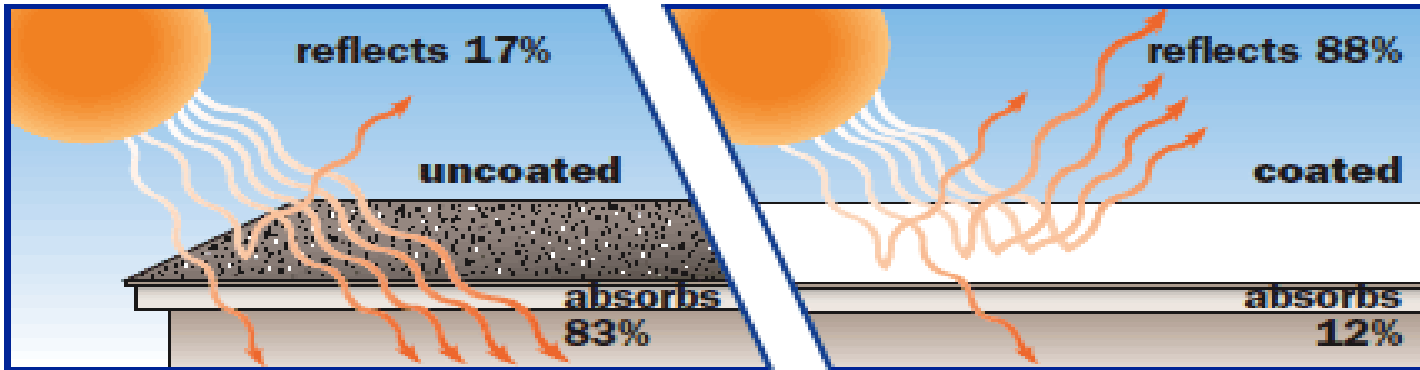
Urban Heat Island Profile



Source: CDPH CA.gov

Source: Encyclopedia of Earth

Heat Solutions: Built Environment



Warmer inside, higher energy bills

Cooler inside, lower energy bills

- Cool roofing
- Cool pavements
- Shading: plant trees and use vegetation
- Manage and restore parks
- Increase road connectivity and bike/walk infrastructure
- Energy efficiency measures
 - Roof deck insulation
 - wall insulation
 - high performance windows
 - building orientation

Source: CA.gov

Protect your family from extreme heat!

- Check on elderly or at-risk friends or neighbors regularly -- or ask someone to look in on you if you feel vulnerable to heat.
- Know where the public cooling centers are located. Call 2-1-1 San Diego or visit CoolZones.org for a list of locations.

WHAT CAN YOU DO?



STAY COOL

- Find an air-conditioned shelter
- Avoid direct sunlight
- Wear lightweight, light-colored clothing
- Take cool showers or baths
- Do not rely on a fan as your primary cooling device



STAY HYDRATED

- Drink more water than usual
- Don't wait until you're thirsty to drink more fluids
- Avoid alcohol or liquids containing high amounts of sugar
- Remind others to drink enough water



STAY INFORMED

- Check local news for extreme heat alerts and safety tips
- Learn the symptoms of heat illness

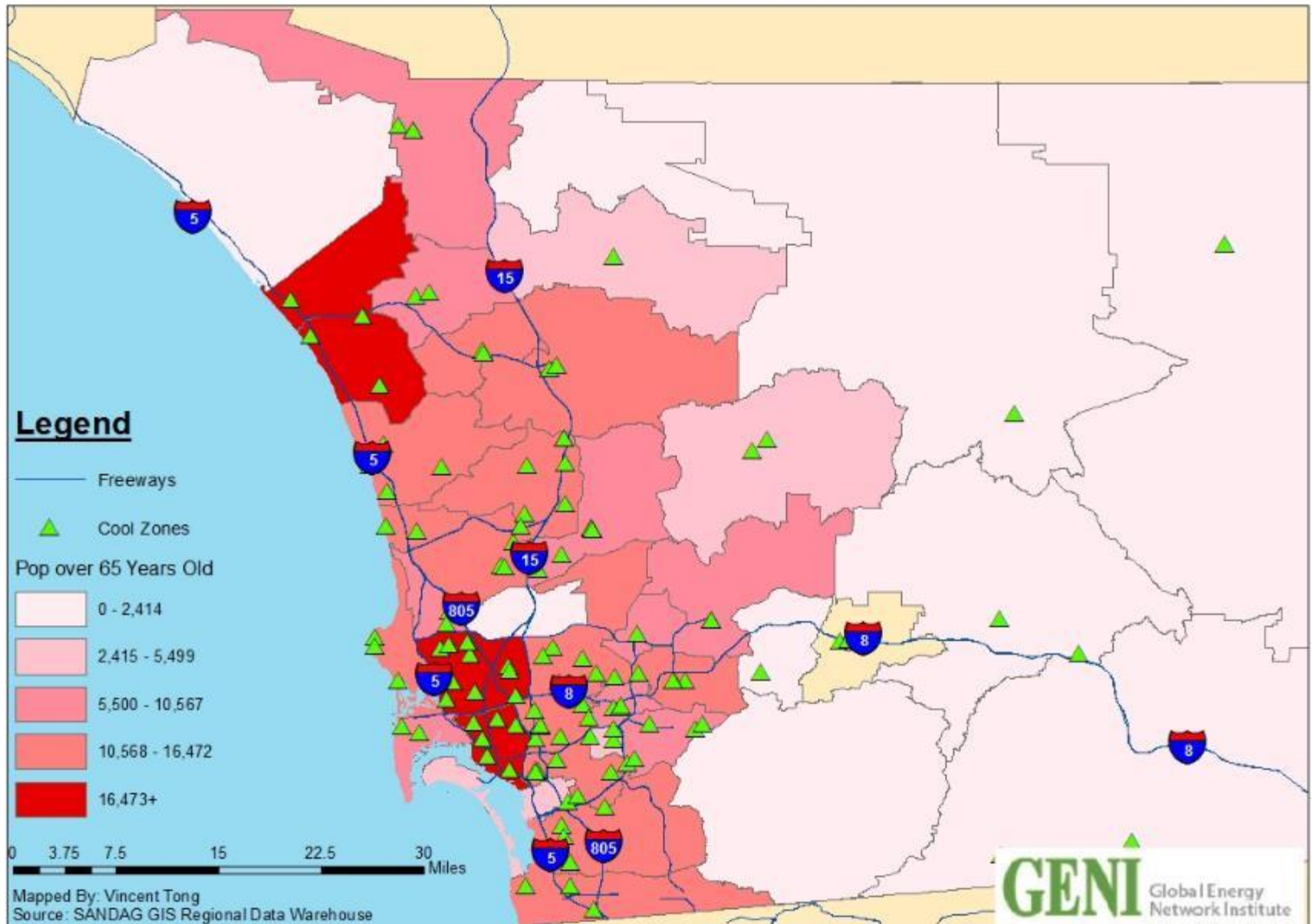


LEARN MORE!

Visit CDC's Environmental Public Health Tracking Network to learn more about climate change and extreme heat at

cdc.gov/ephtracking

San Diego County Cool Zones w/ respect to Elderly Population



GENI Global Energy Network Institute

Wildfire Preparedness

- Register your mobile phone with AlertSanDiego if you haven't already!

- Decks are a major risk. Make sure they are built of non-flammable material.

HOW TO PROTECT YOUR HOME FROM WILDFIRES

Create a "fuel-free" buffer zone (area clear of vegetation) of at least 50 feet around your home.



Source Firewise Communities,
www.firewise.org



**CHECK YOUR
WEEKEND FORECAST**

WEATHER.USATODAY.COM

Wildfire Smoke & Your Health

- Protect yourself from wildfire smoke
 - Stay indoors
 - Run your AC if you have it
 - Don't use anything that burns such as gas stoves, wood stoves, candles
 - Drink plenty of fluids to moisten respiratory tract
 - Air filters can be helpful. Change filters frequently.
 - Dust masks will not protect your lungs from fine particles present in wildfire smoke.



Source: Air Pollution Control District

Combat Air Pollution

Personal Recommendations

- Check news reports on the radio, TV, or online for pollen reports or daily air quality conditions (EPA's Air Now)
- After spending time outdoors, wash off pollen that may have collected on your face, skin, or hair.



City Recommendations

- Expand the Electronic Death Reporting System for the continuous monitoring of asthma
- Create our own Spare the Air Program like the Bay Area Air Quality Management District



My Air
My Health

U.S. Department of Health and Human Services
U.S. Environmental Protection Agency



Air Pollution Solutions: Built Environment

- Lower GHG emissions
 - Urban greening: low pollen producing plants
 - Increase public transit
 - Design more walkable, bikable communities
 - Conserve energy and use renewables!

This will directly benefit respiratory and cardiovascular disease and promote physical activity.

Low Pollen & Low Water/Drought Resistant Trees for the SouthWest

Brachychiton populneus
(Bottle Tree)



Ceratonia siliqua (Carob)
female



Source: Arizona Health Sciences Center



Copenhagen, Denmark is a model city for air pollution.

Source: Asthma Foundation

Prevent Water Pollution from Sea Level Rise & Flooding

It is up to **YOU** to keep our water **swimmable**, **fishable**, and **drinkable** as storm water and urban runoff increase!

- Don't dump anything into the storm drains
- Use pesticides/fertilizers sparingly
- Throw trash in garbage- including cig butts!
- Use a car wash

- Pick up dog poop



- Fix clunker car
- Direct water from driveway back to garden
- Sweep driveways

Aspen's Urban Runoff Management Plan

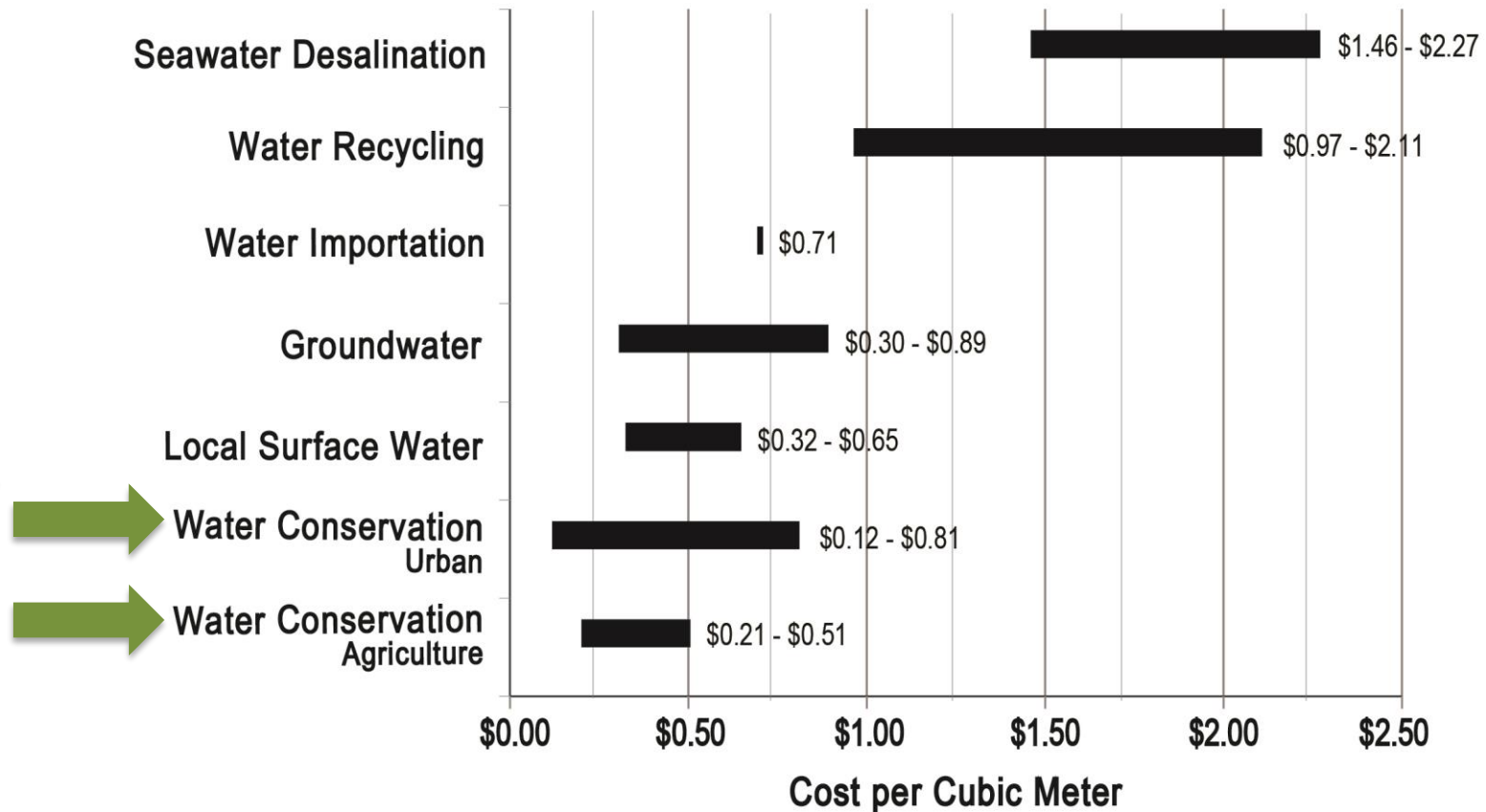
- Vaults
 - Water passes through trash rack
 - Floating pollutants are skimmed off
 - Top water pours out of vault, sediment is trapped at the bottom
- Street Sweeping
- Pervious Pavers



Preparing and Responding to Drought

Comparison of costs of future water supply solutions

Conservation is the most cost-effective solution



Source: Brian Richter, The Nature Conservancy and University of Virginia

Household Level: Conservation is Key



Mandatory Water
Restrictions
Stage 2 Drought Alert
effective **July 24, 2014**

City of San Diego Requirements

- Water landscapes < 3 times per week before 10AM, after 6PM.
- Use hand held hose with shut off valve for car washing
- Serve water to restaurant patrons only upon request

Protect your family from water shortage and malnutrition

- Visit EPA's WaterSense for tips on conserving water, such as replacing leaky pipes.
- Agricultural water users can find conservation options with a local Cooperative Extension Service agent.

Source: San Diego Gov

Infectious Disease

Protect your family from infectious diseases

- When planning international travel, check with the CDC's website for info on recent disease outbreaks and take appropriate precautions.
- During mosquito season at home, apply insect repellent with 20-30 percent DEET in the mornings and early evenings.
- Get vaccinated



**Don't
Wait...
Vaccinate**

City Recommendations

- Track diseases and trends related to climate change
 - Vector-, water-, and food-borne diseases

Raise Awareness and Foster Action!



Safety Expects the Unexpected

- Small changes we make in our daily lives are essential to ensuring our health and well-being.
- A county of everyday people making everyday decisions with environmental and personal health in mind can create lasting change.

“Many of the major public health challenges will only be addressed if we engage with processes that **shape our living environment**”



True healthcare reform starts in your home, not in Washington.

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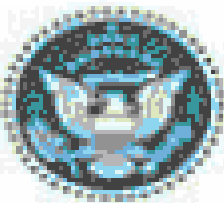


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