

APA's Sustainability & Resilience Series

Planning for sustainability means balancing social, economic, and environmental resources, incorporating resilience, and linking local actions to regional and global concerns.

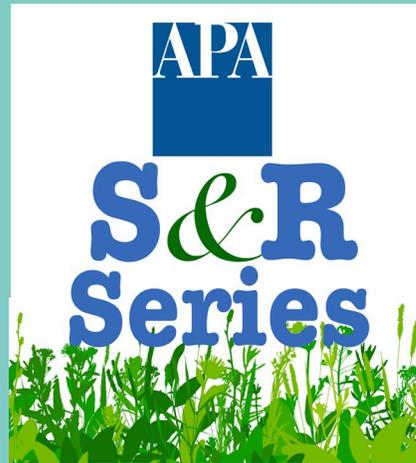
Planning for resilience means supporting the capacity of individuals, communities and systems to survive, adapt and thrive in the face of chronic stresses and acute shocks and even transform when conditions require it.

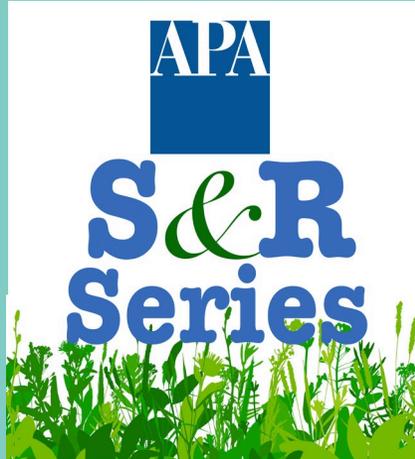
- ✓ *2 years, 12 topics, basics and intermediate*
- ✓ *Diverse perspectives, inclusive content*
- ✓ *Live & recorded offerings for AICP credit*
- ✓ *Applicable for the S&R AICP CM credit*

Interested volunteers & speakers: please email karla@ebenbach.com



A Climate Mitigation and Adaptation Primer for Planners





Today's Panel:

A Climate Mitigation and Adaptation Primer for Planners

December 16, 2022



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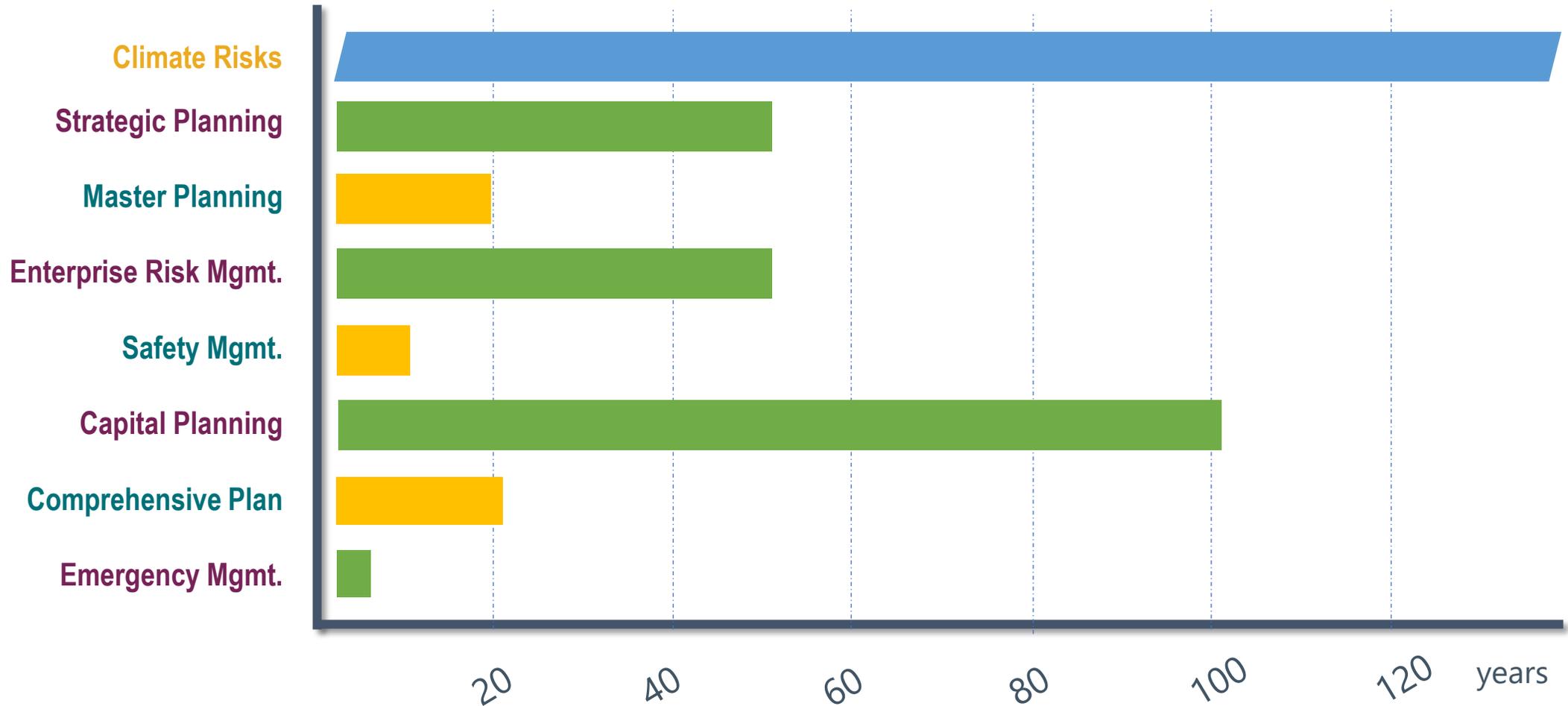
WHY PLANNERS?



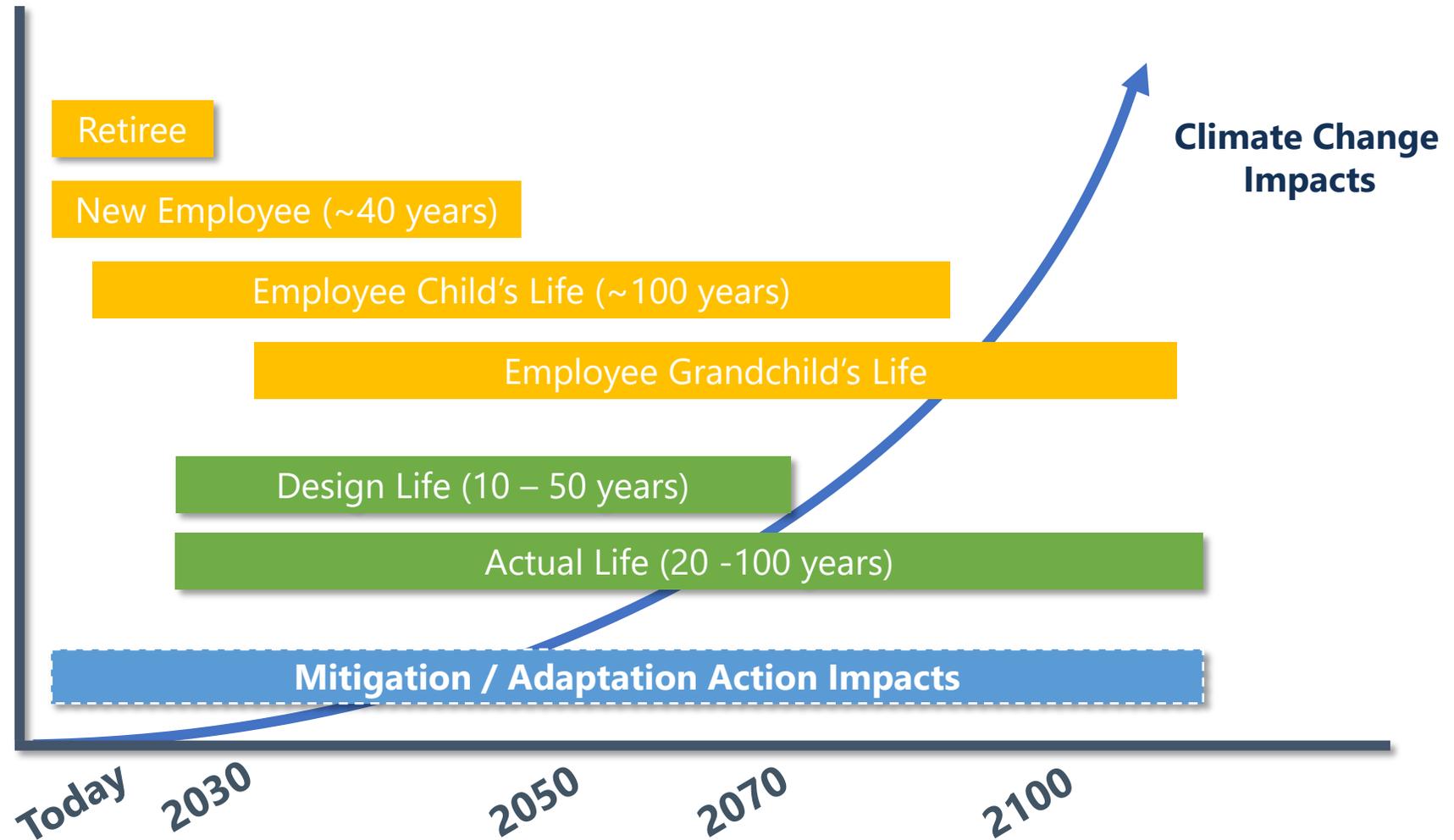
We have a(n):

- **Comprehensive Perspective**
- **Long-range Outlook**
- **Place-based Orientation**
- Concern for Health, Safety and Welfare
- **Sensitivity to Unintended Consequences**
- Expertise in **Community Engagement**
- Capacity for **Collaboration & Leadership**

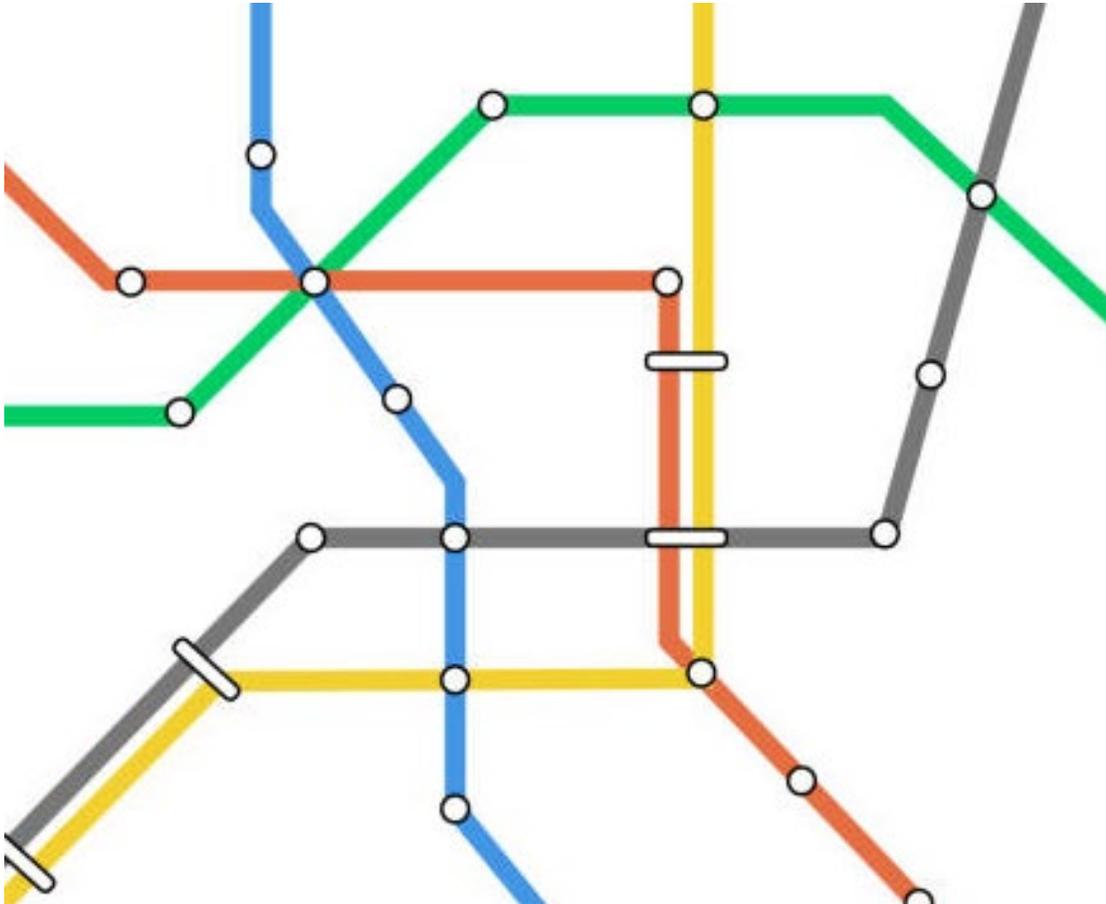
WHY PLANNERS?



WHY PLANNERS?



WHY PLANNERS?



Deep uncertainty requires planning:

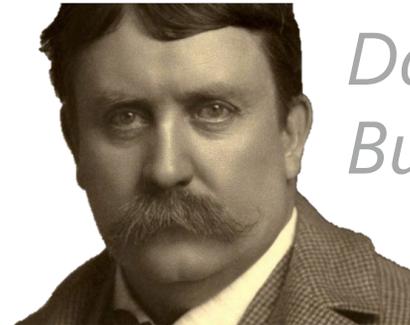
- What could happen in the future?
- What is our risk tolerance?
- What is vulnerable?
- Where are our priorities?
- When should we act?
- When do we change course?
- How much resilience is enough?
- Who benefits?

WHY PLANNERS?



WHY PLANNERS?

*Make big plans,
aim high in hope and work...
long after we are gone
[the plan] will be
a living thing....*



*Daniel
Burnham*

A Climate Mitigation and Adaptation Primer for Planners

APA Presentation 12-16-2022

CO₂ Tons/Year

3.0e+02 3.0e+00 3.3e+01 3.3e+02 1.8e+03 4.5e+03 1.5e+04 3.4e+04 8.2e+04

CO₂ Emissions. @PythonMaps

This map shows the world's CO₂ emissions and shows tonnes of CO₂ within 0.1x0.1 degree grid tiles in 2018.

Data source - https://edgar.jrc.ec.europa.eu/dataset_ghg60

The global population emits approx.
34 billion tons of CO₂ per year.



A glowing map of the United States is centered in the image, surrounded by a dense, golden web of lines that radiate outwards, symbolizing carbon emissions. The map is set against a dark background, and the lines are a bright, golden-yellow color. The overall effect is one of intense energy and complexity.

The average American is responsible for producing 14.4 tons of CO₂ per year; compared to 7.1 tons for a Chinese citizen.

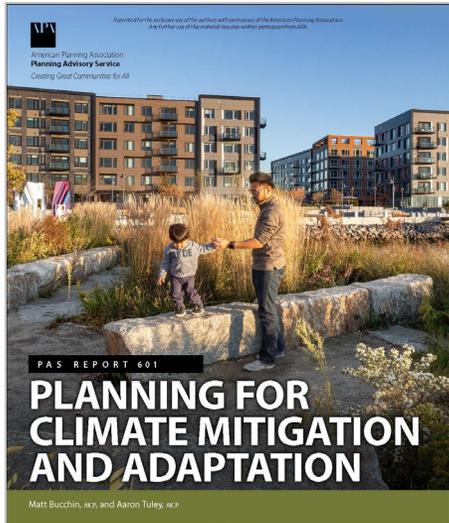
(A. Symington, Visual Capitalist 11/29/2022)

TODAY'S AGENDA

- Overview APA's Planner Advisory Service Report # 601 – Planning for Climate Mitigation and Adaptation
 - » Climate science and key impacts
 - » Climate mitigation and adaptation
 - » Tools and resources for planners
- Q&A



CLIMATE CHANGE PAS REPORT – CONTRIBUTORS



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CASE STUDY CONTRIBUTORS

- Tamara Cook
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- Marco N. Velotta

CLIMATE CHANGE PAS REPORT – 10 CHAPTERS

1

A Warming Planet

- Introduction to the climate emergency
- Why planners?

SETTING THE STAGE

2

Climate Change & Impacts

- Climate Science and its impacts
- Regional impacts

CLIMATE SCIENCE

3

Planning Response to Climate change

- Introduction to climate change mitigation & adaptation
- Connection between climate change and spatial planning & climate resilience communities

INTRODUCE MITIGATION AND ADAPTATION

4

Climate Mitigation: Emissions Generation and Reduction

- GHG emissions generation & reduction

MITIGATION BASICS

5

Climate Mitigation Planning

- Climate mitigation policy & regulatory frameworks
- Challenges and benefits

MITIGATION PLANNING TOOLS

CLIMATE CHANGE PAS REPORT – 10 CHAPTERS

6

Climate Impacts and Adaptive Responses

- Identification of climate impacts by sector (e.g., energy)

ADAPTATION
BASICS

7

Climate Adaptation Planning

- Climate adaptation planning

ADAPTATION
PLANNING

8

Case Studies in Climate Mitigation

- 7 case studies for climate mitigation

MITIGATION CASE
STUDIES

9

Case Studies in Climate Adaptation

- 5 case studies for climate adaptation

ADAPTATION CASE
STUDIES

10

Taking Climate Action

- A planner's role
- Principles for climate action
- Climate planning framework
- Planner's commitment
- Climate action tools

TOOLS FOR
ACTION

KEY FINDINGS

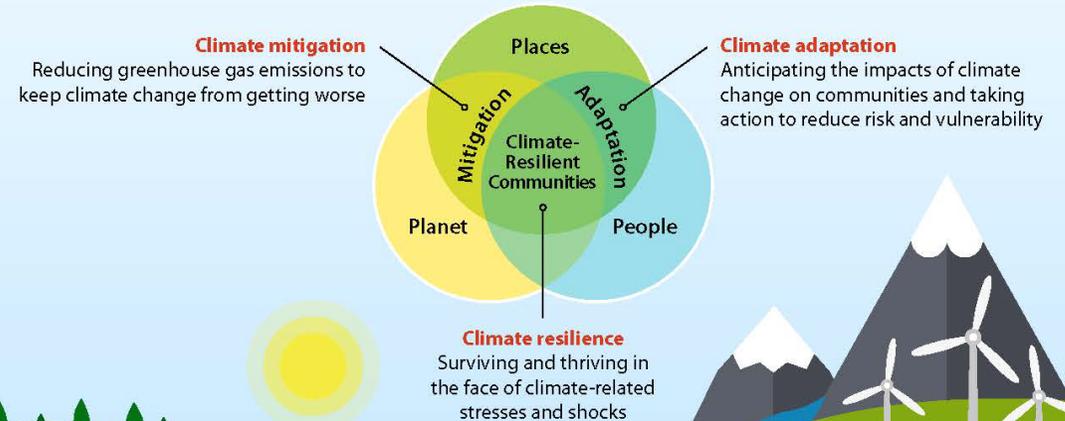
- Global climate change is getting worse at an increasing rate
- Projected impacts of climate change are intensifying and not equal
- Global responses to address climate change has not been enough
- The United States will need to take a leadership role in solving climate change
- Climate solutions across all sectors are needed
- Planners need to take the leadership role in addressing the climate crisis

MOVING TARGET? 50% REDUCTION IN GHG EMISSIONS BY 2030; NET ZERO BY 2050

“Global commitments, national policies, and local planning must all work together confronting and combating climate change and its impacts on people, places, and our planet.”
APA President Leo Asuncion, Jr., AICP

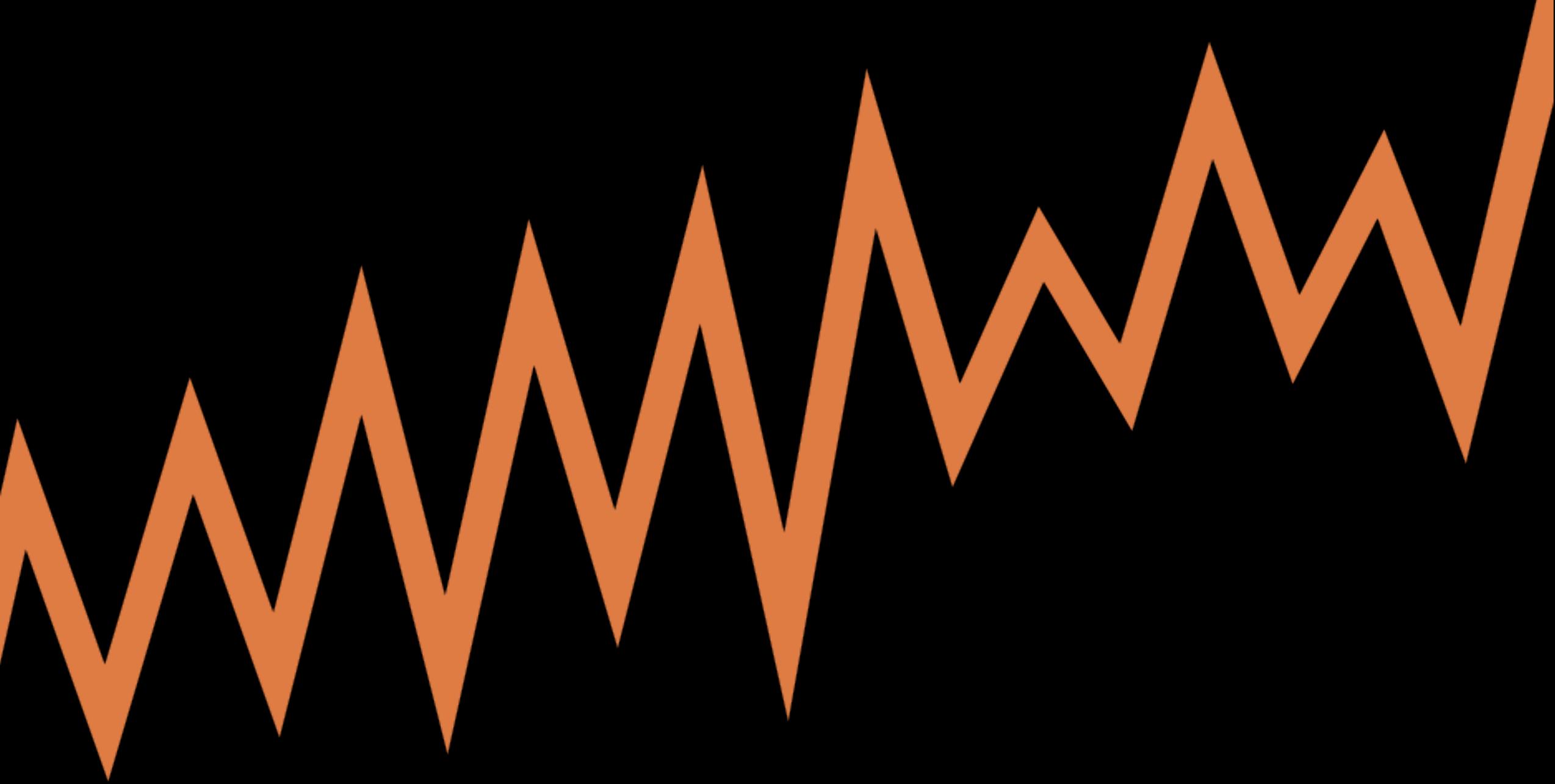
A Climate Crisis

The Earth is warming at an unprecedented and accelerating rate — a climate emergency caused by human activities. Get a comprehensive foundation to take on this global challenge and help lead your community towards a more climate-resilient future with *Planning for Climate Mitigation and Adaptation*.



Action is needed across all sectors. Planners can lead the way.





The Keeling Curve and Earth's Breathing Cycle



Land Mass in Southern Hemisphere





Land Mass in Northern Hemisphere



**Lower CO₂
in global atmosphere**

**Higher CO₂
in global atmosphere**

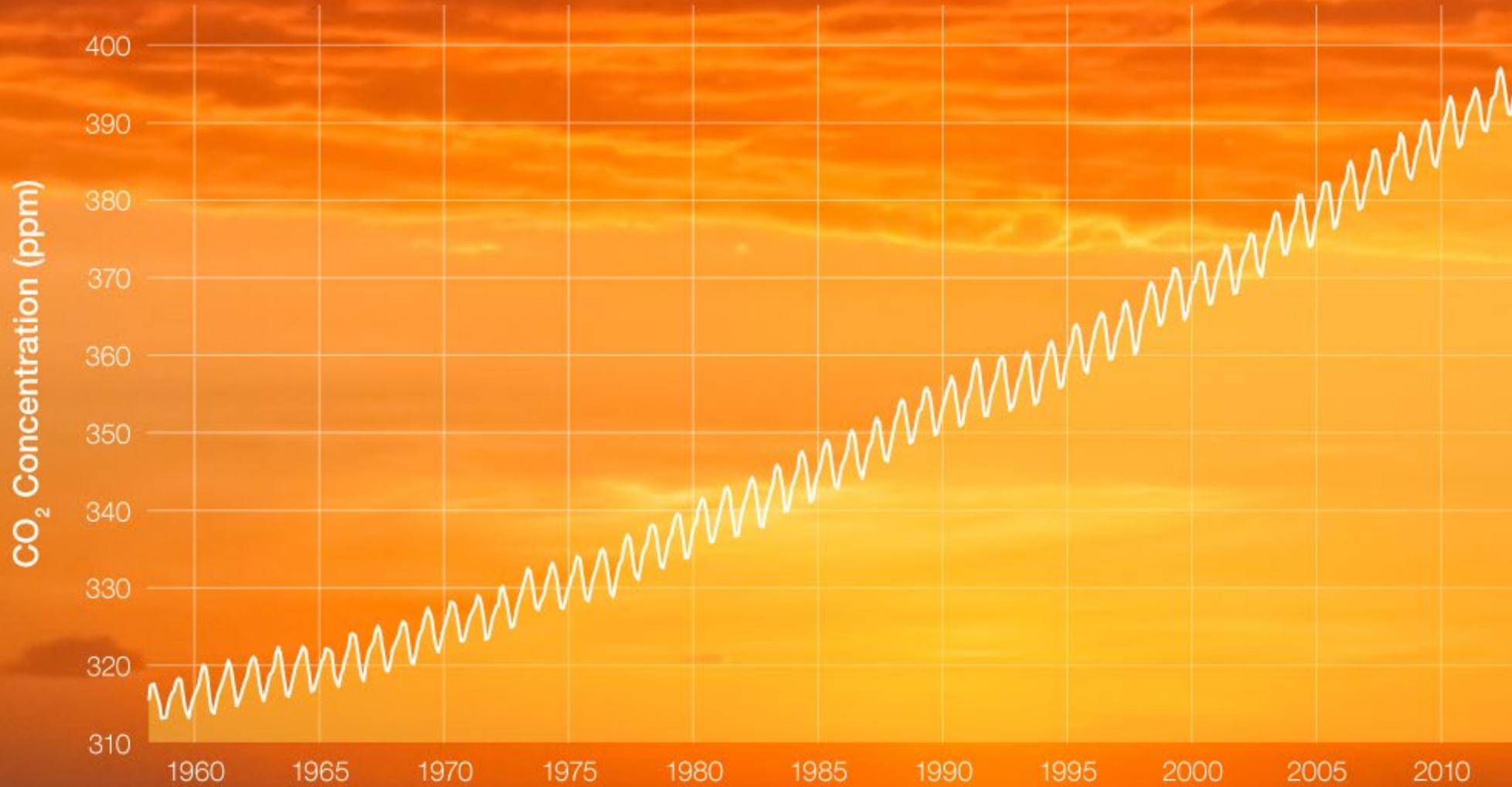




Mauna Loa Observatory, Hawaii
Elevation: 11,135 ft. asl.

Carbon Dioxide Concentration

at Mauna Loa Observatory



RUNAWAY CLIMATE

Scientists are forewarning –

that at approx. 450 ppm CO₂ in the atmosphere, we will trigger potentially irreversible glacial melt and sea level rise –
“out of humanity’s control.”

421 ppm

We are currently at ~~385 ppm~~ CO₂, and are increasing atmospheric concentrations of CO₂ at approx. 2 ppm annually.

At the current growth rate of 1.5%, *we will reach 450 ppm in 2035.*

Global greenhouse gas emissions and warming scenarios



- Each pathway comes with uncertainty, marked by the shading from low to high emissions under each scenario.
- Warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

in gigatonnes of carbon dioxide-equivalents

150 Gt

100 Gt

50 Gt

Greenhouse gas emissions up to the present

0

1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100

No climate policies

4.1 – 4.8 °C

→ expected emissions in a baseline scenario if countries had not implemented climate reduction policies.

Current policies

2.5 – 2.9 °C

→ emissions with current climate policies in place result in warming of 2.5 to 2.9°C by 2100.

Pledges & targets (2.1 °C)

→ emissions if all countries delivered on reduction pledges result in warming of 2.1°C by 2100.

2°C pathways

1.5°C pathways

DIFFERENCE BETWEEN 1.5°C AND 2.0°C

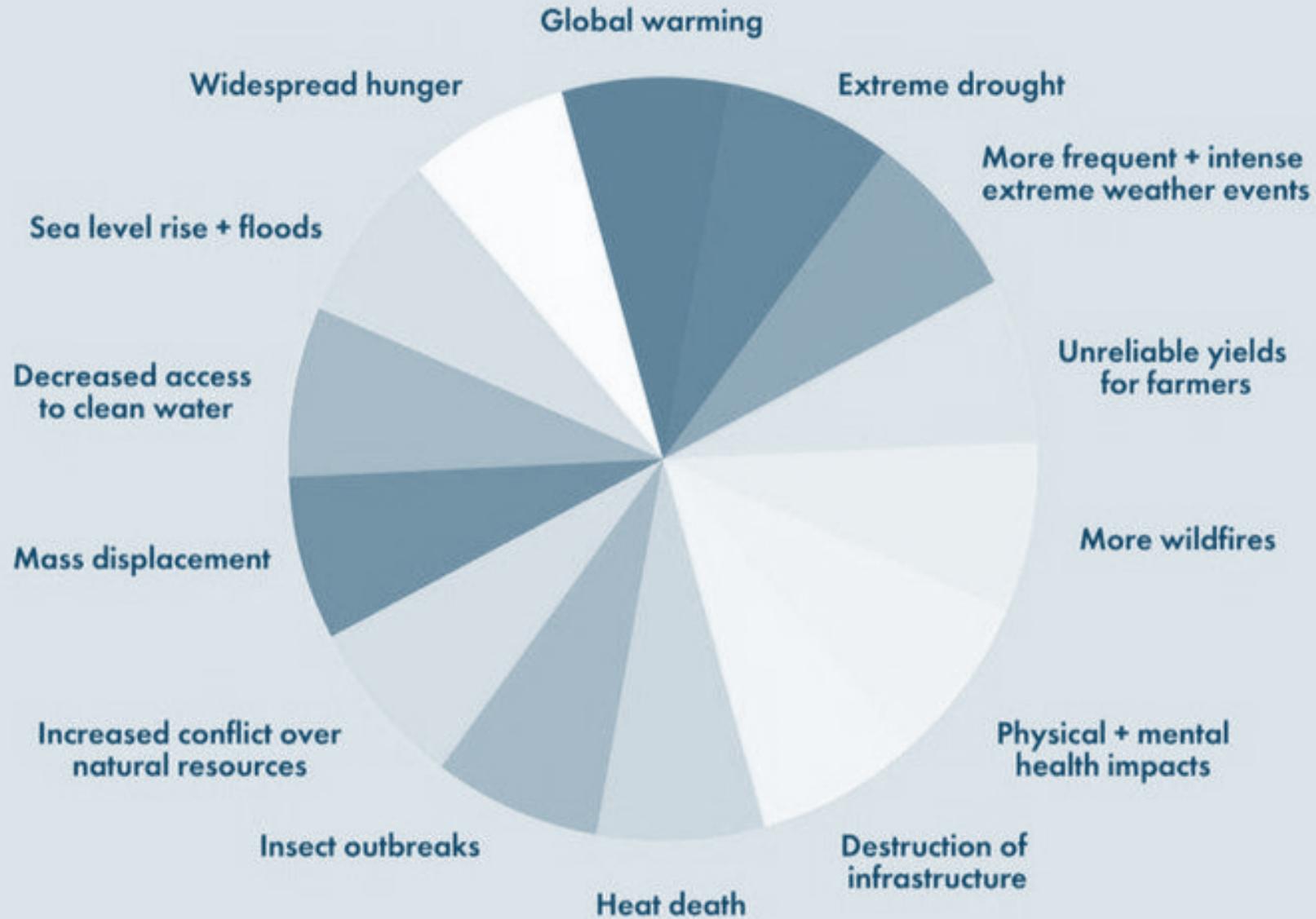
The U.N. Environment Programme Emissions Gap report that was released ahead of the climate conference concluded there is “no credible pathway to 1.5°C in place,” and that “Only an urgent system-wide transformation can avoid climate disaster.”

– IPCC during COP27 (Nov. 2022)

IMPACT	1.5°C	2.0°C	2°C IMPACTS
Global population exposed to extreme heat at least once every 5 years	14%	37%	2.6x worse
Sea level rise by 2100	0.40 M	0.46 M	10x worse
Species loss for vertebrates and plants	4%	8%	2x worse
Ecosystem shifts	7%	13%	1.86x worse
Permafrost thaw	4.8 million KM ²	6.6 million KM ²	38x worse
Crop Yields (maize)	3%	7%	2.3 worse
Coral reef decline	70-90%	99%	29x worse

Source: World Resources Institute

CLIMATE CHANGE IMPACTS

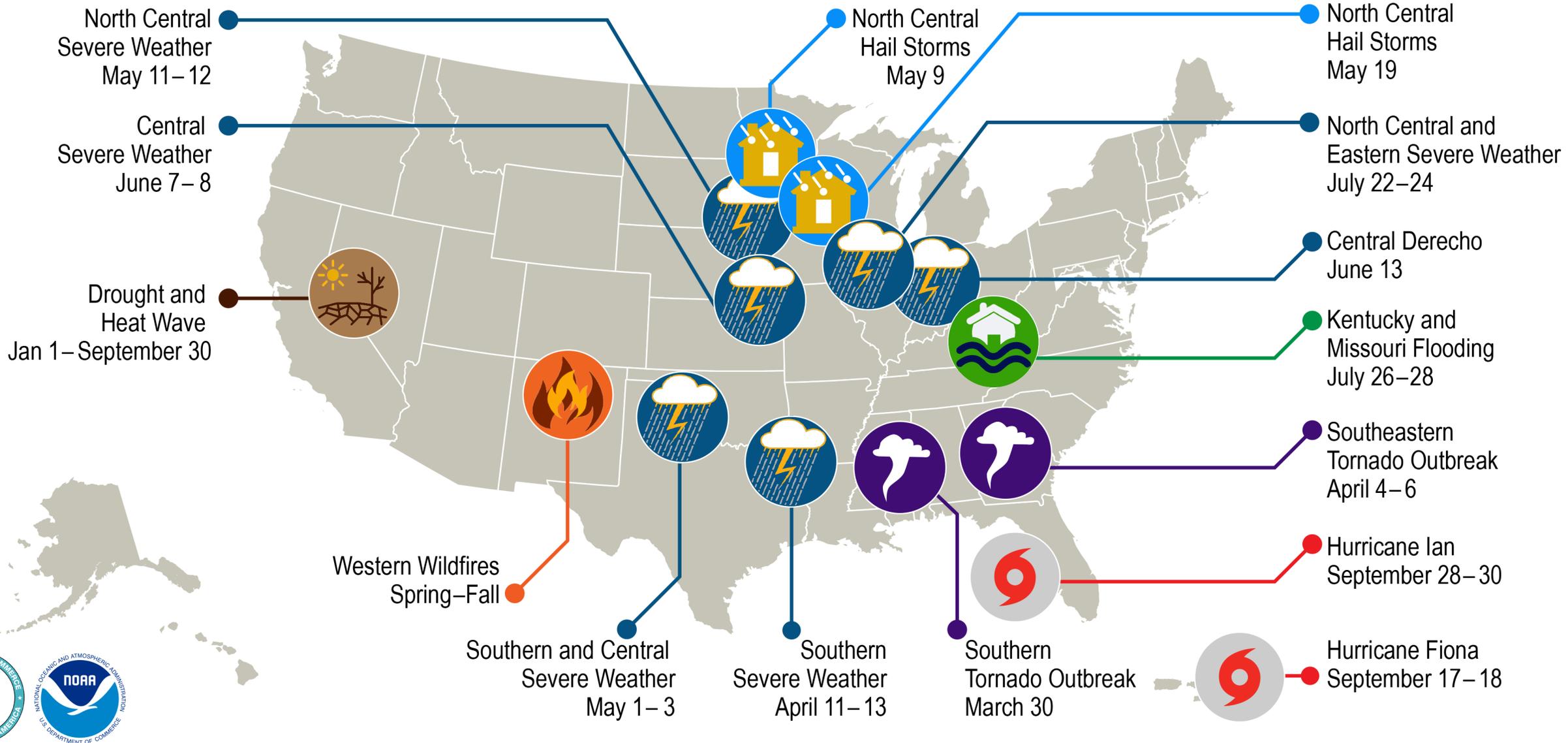


CLIMATE CHANGE IMPACTS

ENERGY	TRANSPORTATION	LAND USE	INFRASTRUCTURE	BUILDINGS	MATERIALS	NATURAL SYSTEMS	PUBLIC HEALTH
<ul style="list-style-type: none"> ▪ Changing energy supply portfolio ▪ Changes in seasonal energy demands ▪ Decreased grid reliability ▪ Extreme weather disruptions ▪ Changes in water availability 	<ul style="list-style-type: none"> ▪ Roadway failure ▪ Decreased system reliability ▪ Transition to Electrification ▪ Changes in mode choice ▪ Inadequate design for future climate conditions ▪ Increasingly vulnerable fixed facilities ▪ Extreme weather disruptions 	<ul style="list-style-type: none"> ▪ Decreased agricultural productivity ▪ Increased droughts ▪ Wildland urban interface issues ▪ Mass migration ▪ Increased economic activity disruptions 	<ul style="list-style-type: none"> ▪ Coastal erosion ▪ Storm surge ▪ Decreased water supply ▪ Increased water demand ▪ Reduced infrastructure reliability ▪ Infrastructure failure ▪ Increased impacts from extreme weather events 	<ul style="list-style-type: none"> ▪ Increased urban heat ▪ Urban flooding ▪ Extreme storm events ▪ Inadequate building envelopes ▪ Increasing risk ▪ Increasing insurance costs 	<ul style="list-style-type: none"> ▪ Increasing quantities of waste from disasters ▪ Changing material requirements ▪ Changing material processing requirements ▪ Increasing source/waste material transportation costs 	<ul style="list-style-type: none"> ▪ Decreased snowpack ▪ Earlier Snowmelt ▪ Increased wildfires ▪ Sea level rise ▪ Reduced biodiversity ▪ Species migration and extinction 	<ul style="list-style-type: none"> ▪ Inequitable health disparities ▪ Increased vector borne diseases ▪ Increased water-related illnesses ▪ Increased food insecurity ▪ Decreased air quality

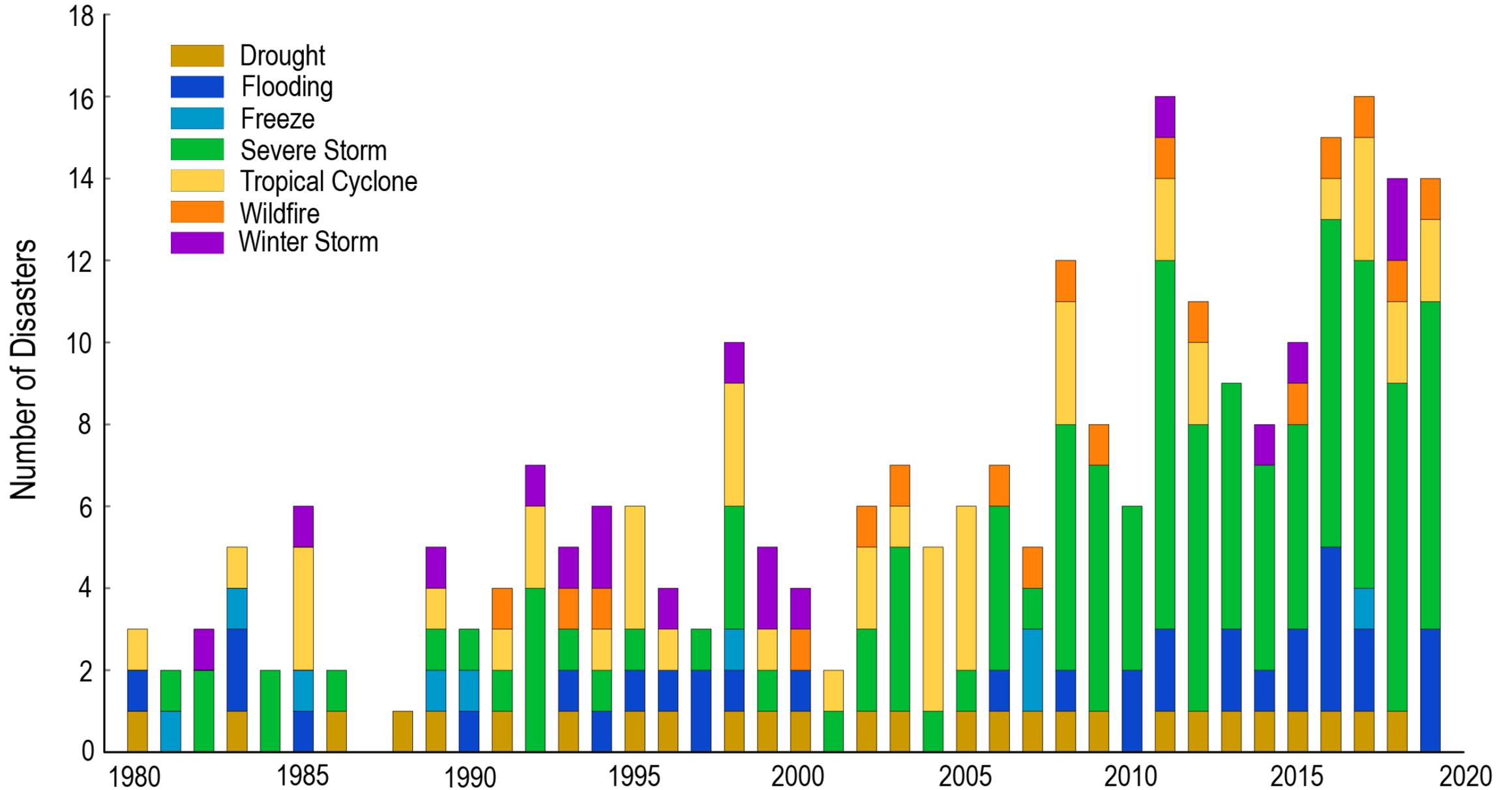
U.S. 2022 Billion-Dollar Weather and Climate Disasters

- Drought/Heat Wave
- Flooding
- Hail
- Hurricane
- Severe Weather
- Tornado Outbreak
- Wildfire
- Winter Storm/Cold Wave



This map denotes the approximate location for each of the 15 separate billion-dollar weather and climate disasters that impacted the United States January – September of 2022.

U.S. Billion-Dollar Disaster Event Types by Year



COMMUNITIES OF COLOR

Some communities of color living in risk-prone areas face cumulative exposure to multiple pollutants.

Adaptation plans that consider these communities and improve access to healthcare help address social inequities.



OLDER ADULTS

Older adults are vulnerable to extreme events that cause power outages or require evacuation.



Checking on elderly neighbors and proper emergency communication can save lives.

CHILDREN

Children have higher risk of heat stroke and illness than adults.



Adults can lessen risk by monitoring exertion and hydration.

LOW INCOME COMMUNITIES

Low income families are at risk of physical and mental illnesses during flooding and in crowded shelter conditions.



Comprehensive disaster management can improve resiliency for people with limited resources.

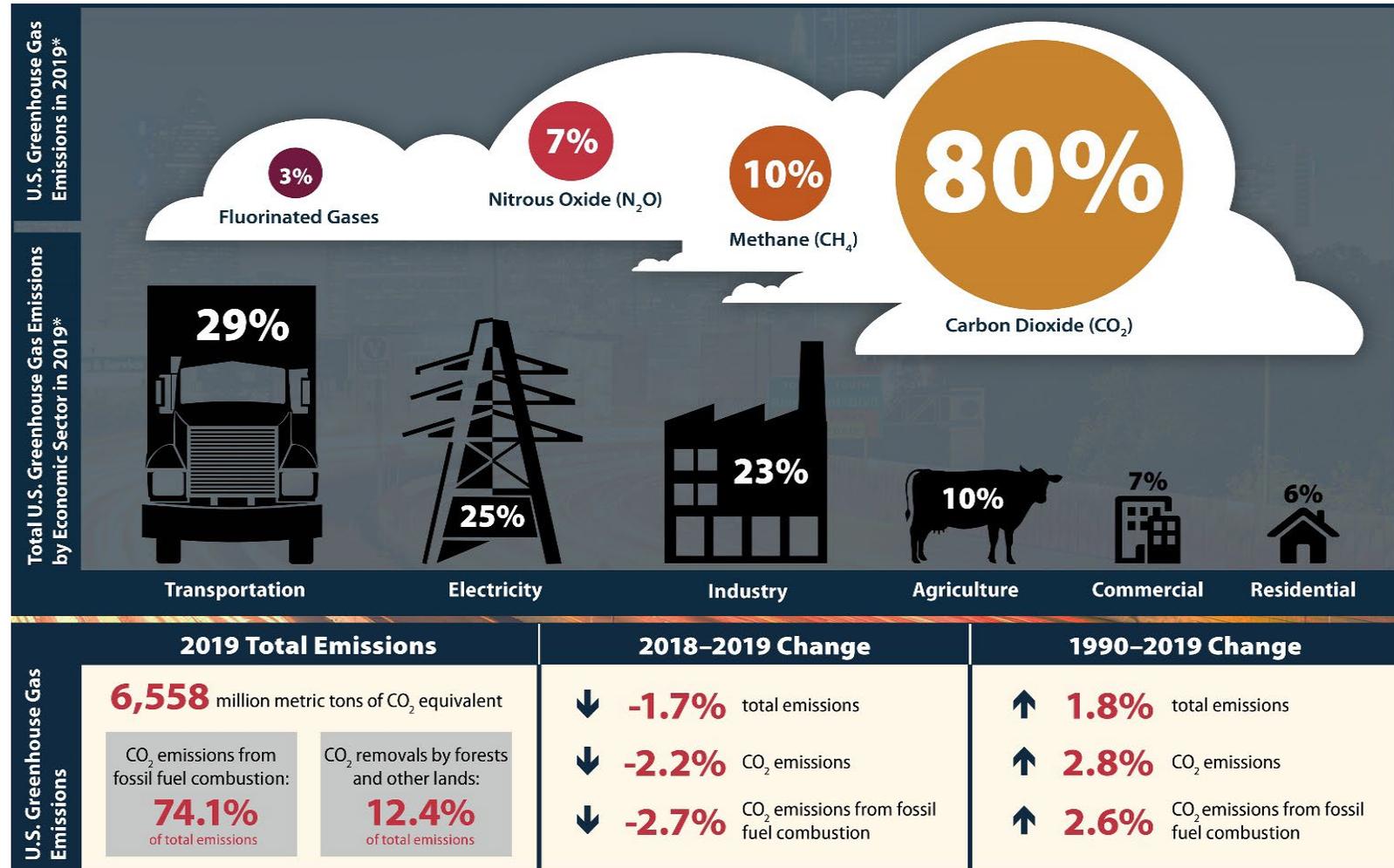
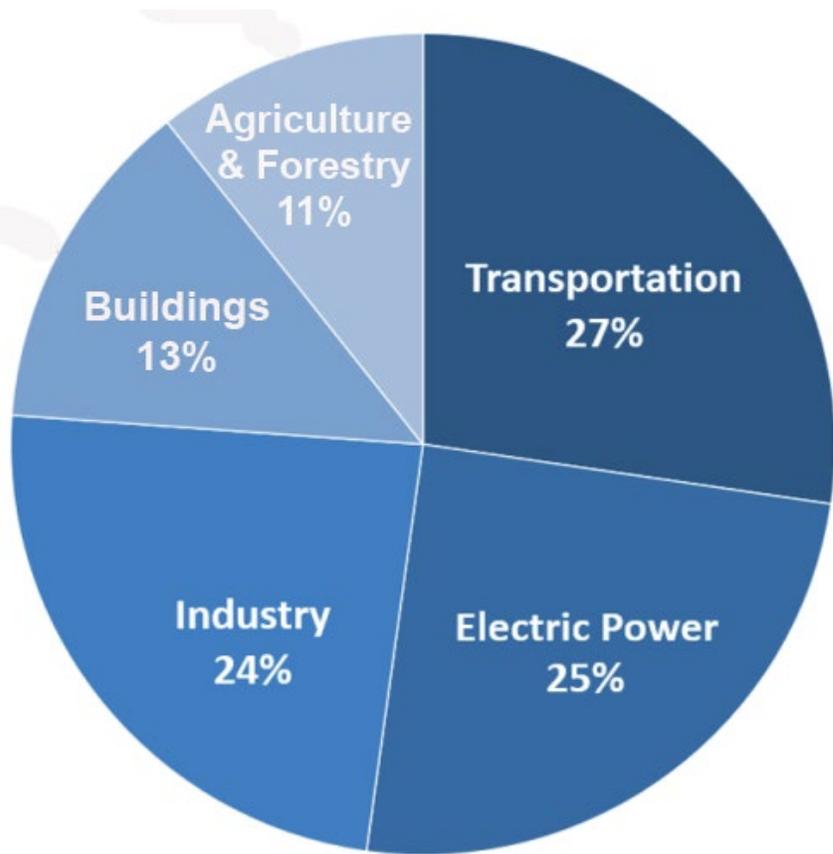


Source: EPA

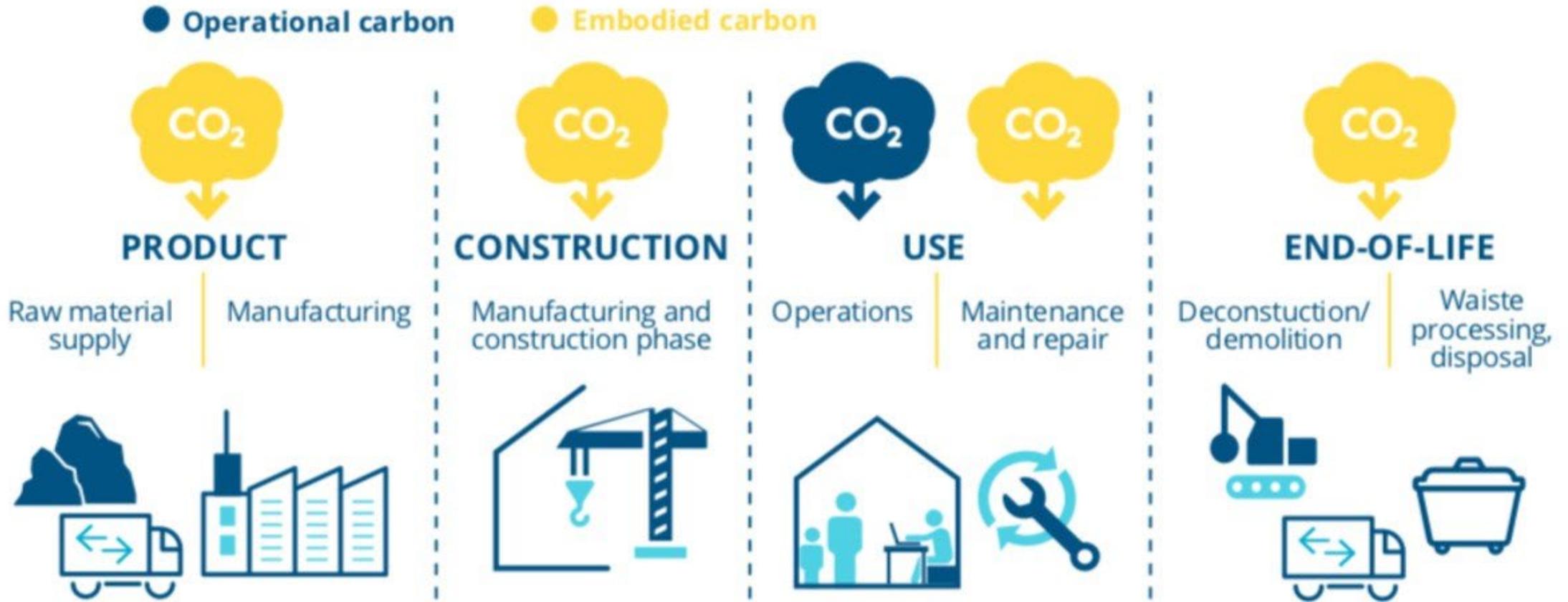
JUST GET RID OF FOSSIL FUELS, RIGHT?

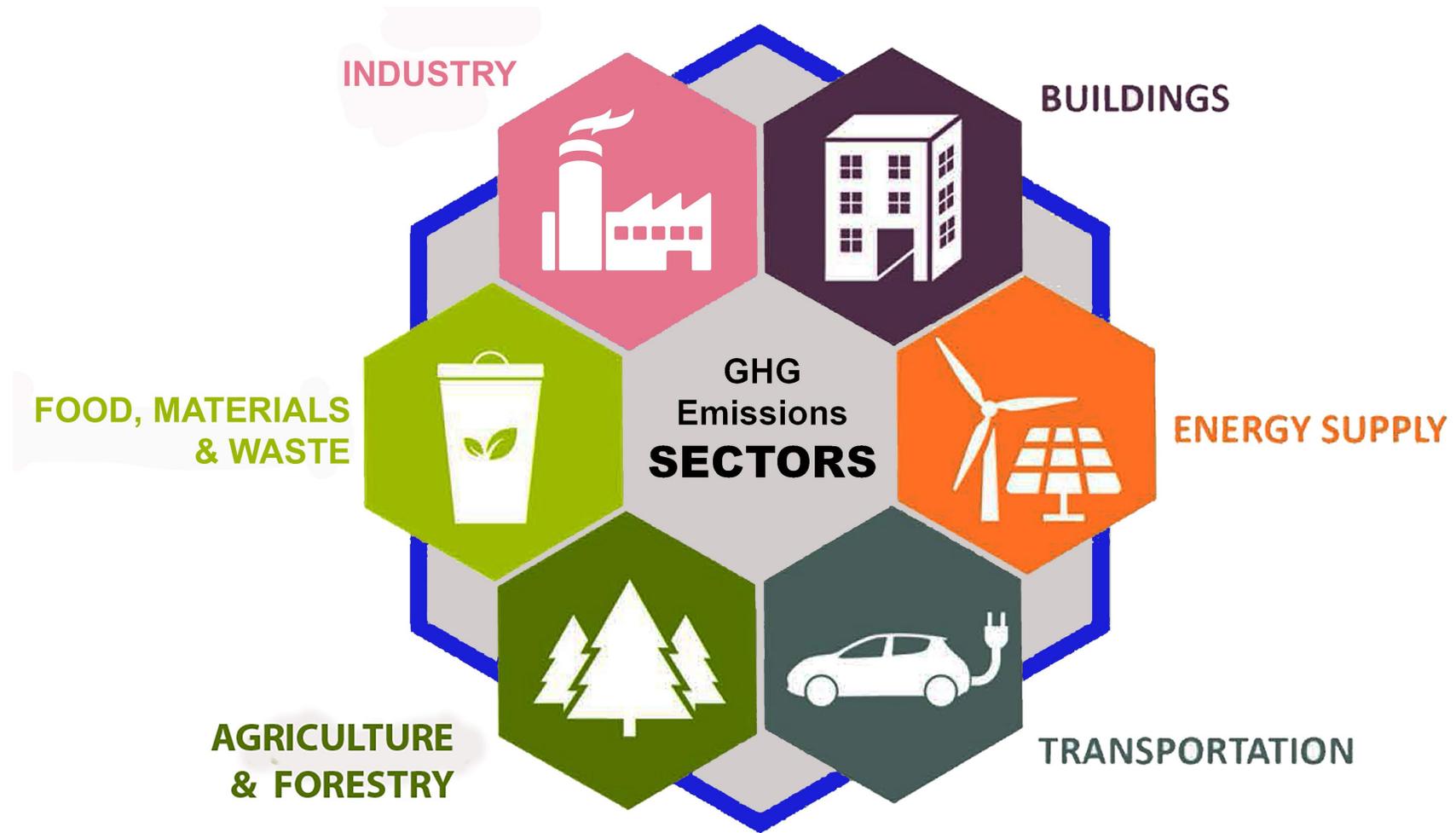


FOSSIL FUELS ARE *EVERYWHERE*



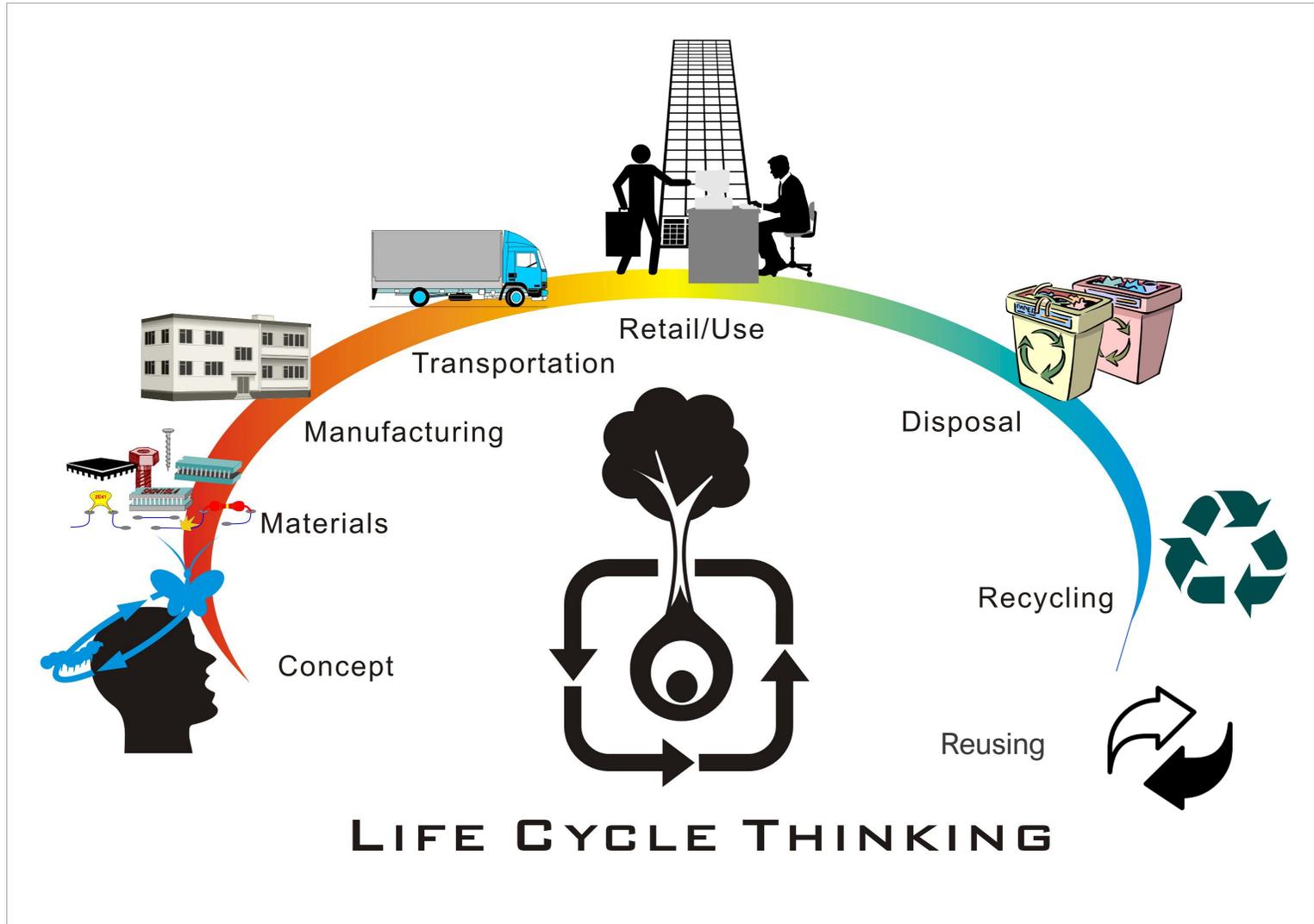
FOSSIL FUELS ARE IN *EVERYTHING*



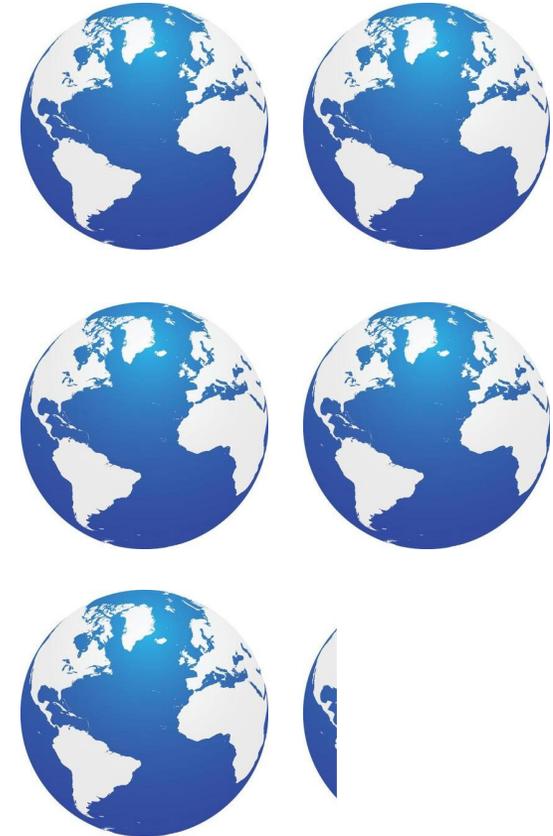


1.5°C will require the world to cut 30 gigatons GHG Emissions annually by 2030 (UNEP).

UNSUSTAINABLE LIFESTYLES



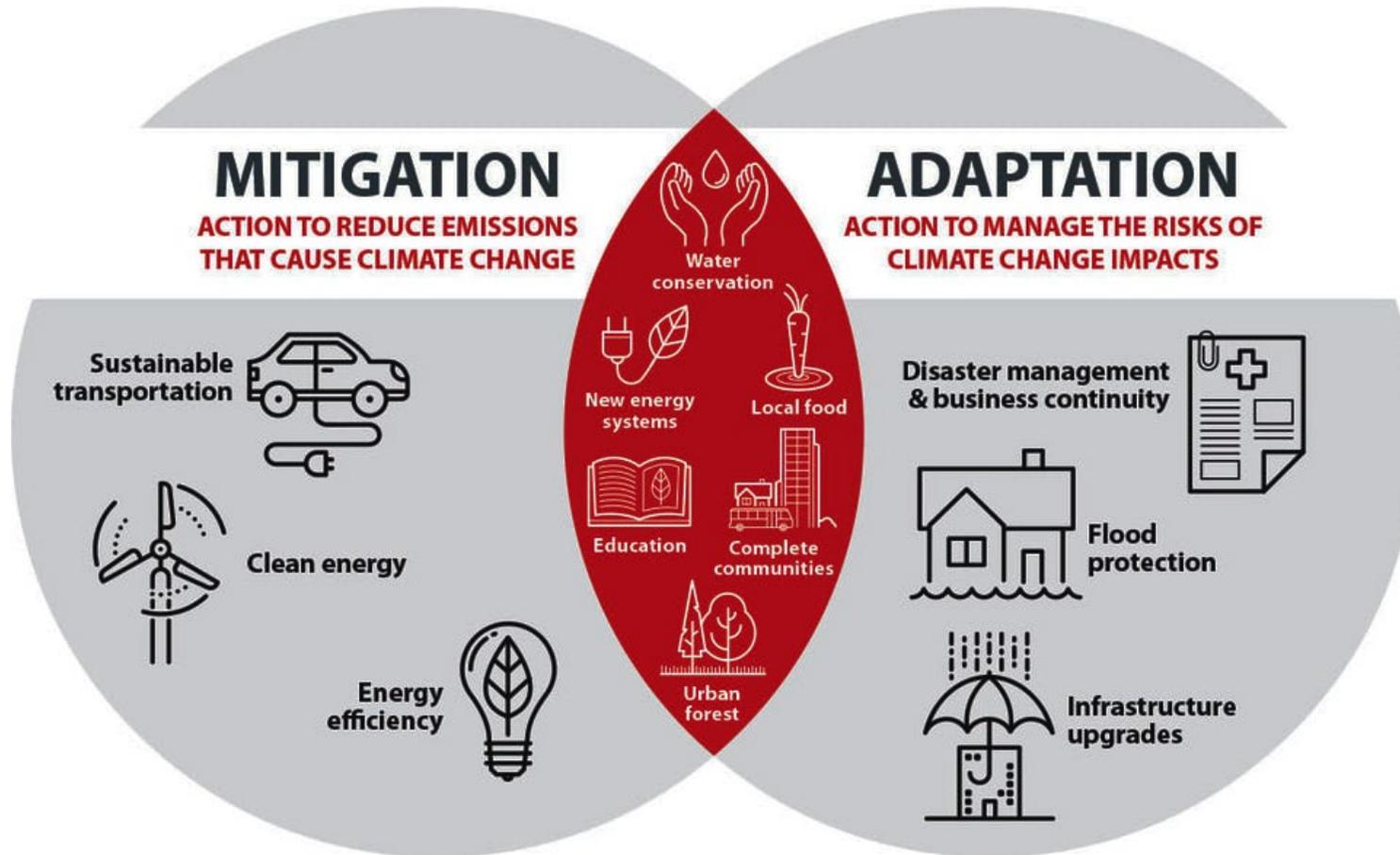
If everyone lived like Americans, we would need **5.1 Earths** . . .



(Earth Overshoot Day)

BUILDING CLIMATE RESILIENCE MITIGATION AND ADAPTATION

MITIGATION and **ADAPTATION** represent
TWO COMPLEMENTARY APPROACHES to addressing climate change



CLIMATE CHANGE MANAGEMENT PROGRAM ATTRIBUTES:

- INTEGRATION
- EVIDENCE-BASED, **INCLUSIVE**, AND DELIVERABLE PLAN
- TRANSPARENT PROCESS



MITIGATION

Avoiding and reducing emissions of greenhouse gases (GHGs) into the atmosphere to prevent further warming of the planet.

DECARBONIZATION

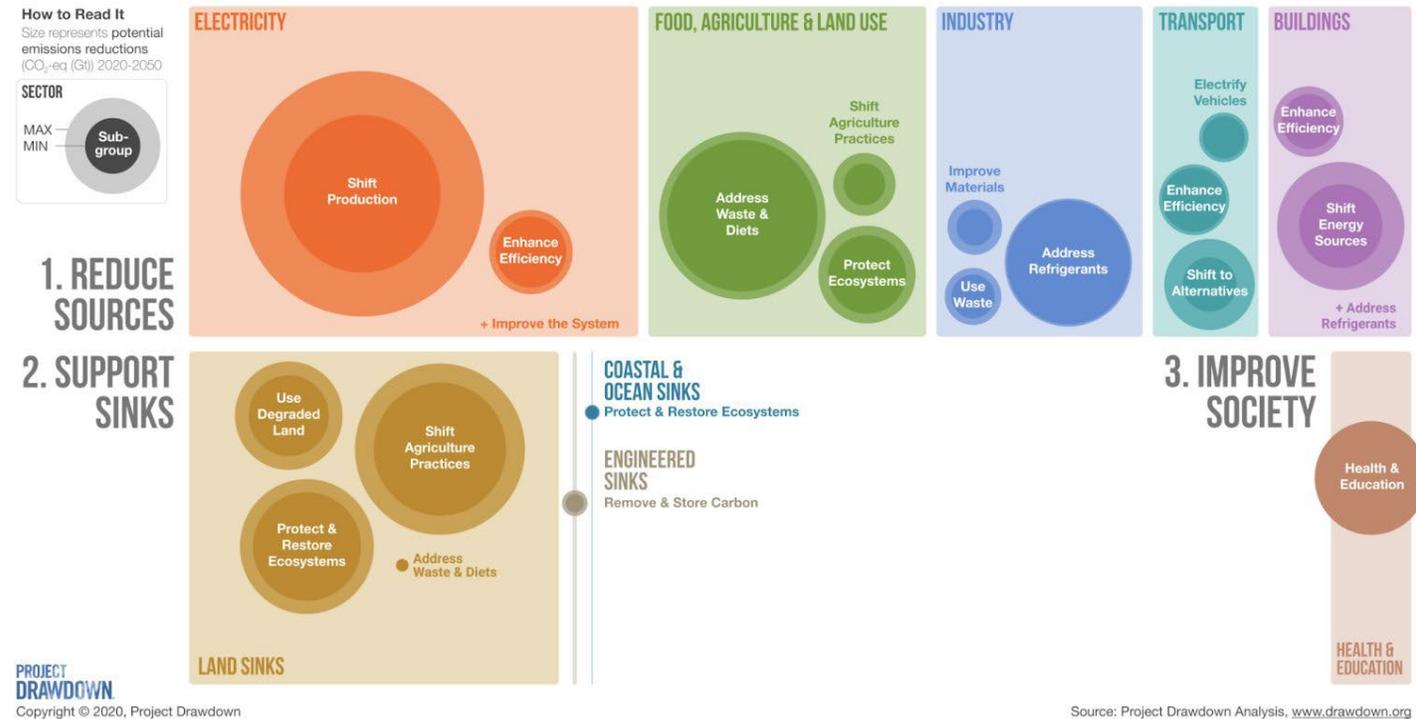
- Reducing Demand for carbon-intensive products and services

CARBON CAPTURE AND SEQUESTRATION

- Removal of Carbon from the Atmosphere
- Creation of Carbon Sinks for Carbon Storage

IMPROVE SOCIAL HEALTH & WELL-BEING

DRAWDOWN FRAMEWORK FOR CLIMATE SOLUTIONS



Source: Project Drawdown Analysis, www.drawdown.org

MITIGATION ATTEMPTS TO REDUCE THE CAUSES OF CLIMATE CHANGE.

ADAPTATION

Climate change **ADAPTATION** means altering our behavior, systems, and—in some cases—ways of life to protect our families, our economies, and the environment in which we live from the impacts of climate change.



- Ensuring infrastructure can withstand more extreme weather
- Resource management

USDA, Adapted from NCA 4 (2018)

ADAPTATION ATTEMPTS TO MANAGE THE IMPACTS OF CLIMATE CHANGE.



MITIGATION / ADAPTATION: POLICY AND REGULATORY FRAMEWORKS

CLIMATE MITIGATION AND ADAPTATION POLICIES should be interrelated with **SUSTAINABLE DEVELOPMENT GOALS** and deliver outcomes that enhance quality of life, improve economic well-being within communities, and advance other development agendas.

Mitigating climate change through ambitious policies can help cities achieve their broader environmental, social, and economic agendas and deliver outcomes for health and prosperity.

MITIGATION POLICY AND REGULATORY FRAMEWORKS

- Comprehensive Plans
- Climate Action Plans (CAPs)
- Mitigation-oriented Ordinances
- GHG Inventories





MITIGATION / ADAPTATION: POLICY AND REGULATORY FRAMEWORKS

CLIMATE MITIGATION / ADAPTATION IN COMPREHENSIVE PLANS

Focuses on local implications of climate change and how specific mitigation and adaptation strategies and actions can reduce GHG emissions and prepare communities for climate impacts.

CLIMATE MITIGATION / ADAPTATION POLICIES

- 1) Prepared in the context of and integrated with conventional Plan Elements
- 2) Stand-alone climate change element

CLIMATE MITIGATION IN COMPREHENSIVE PLANS

Effective and implementable **MITIGATION STRATEGIES** may include:

- Increasing the use of **renewable energy** and access to alternative fuels
- Providing options for **active transportation**
- Designing **energy-efficient** buildings and climate resilient infrastructure
- Protecting and enhancing **natural systems** and **water resources**
- Maximizing co-benefits of **ecosystem services** and **green infrastructure** solutions
- Purchasing **climate-friendly products**
- Educating the public on **socioeconomic** and **public health** impacts of climate change



MITIGATION PLANNING PRINCIPLES

MITIGATION PLANNING PRINCIPLES:

1. Goals
2. Data currency
3. Strategies
4. Public engagement
5. Understandable process
6. Multi-jurisdictional coordination
7. Address uncertainty



MITIGATION POLICY AND REGULATORY FRAMEWORKS: COMPREHENSIVE PLANS

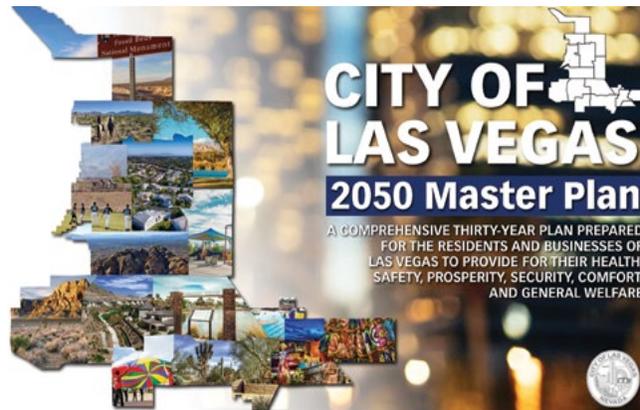
CITY OF LAS VEGAS 2050 MASTER PLAN

FOCUS AREAS:

- Resource Conservation Plan Element
- Integration of renewable energy production, energy efficiency, water conservation, recycling, green building, and alternative transportation into its plans, codes, and capital projects
- Sustainable Energy Strategy

PLAN DRIVERS:

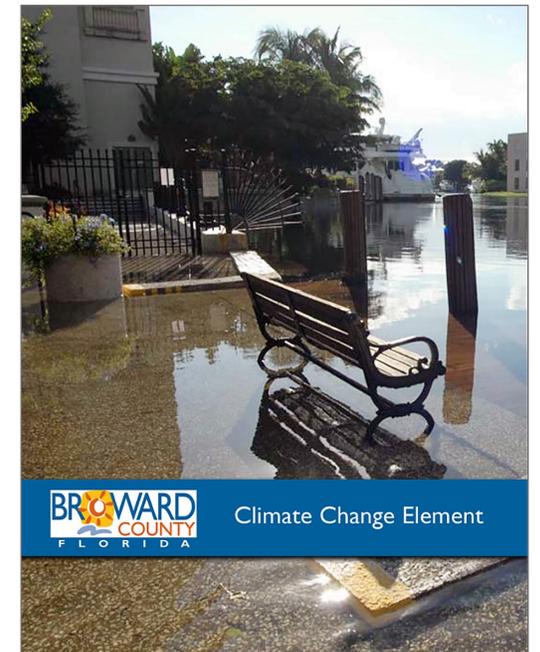
- Increasing temperatures
- extreme risk of drought and associated impacts to water supply



BROWARD COUNTY FL COMPREHENSIVE PLAN CLIMATE CHANGE ELEMENT (2019)

FOCUS AREAS:

- Renewable energy and access to alternative fuels
- Building operations efficiency
- Resilient infrastructure
- Natural systems and water resources
- Green infrastructure
- Education on socio-economic and public health impacts of climate change





MITIGATION: POLICY AND REGULATORY FRAMEWORKS

CLIMATE ACTION PLANS

A **CLIMATE ACTION PLAN (CAP)** is a detailed and strategic framework for measuring, planning, and reducing GHG Emissions while addressing related climatic impacts.

CAPS are produced at regional, state, and municipal levels of government and build upon the information gathered through **GHG INVENTORIES**.

STEPS:

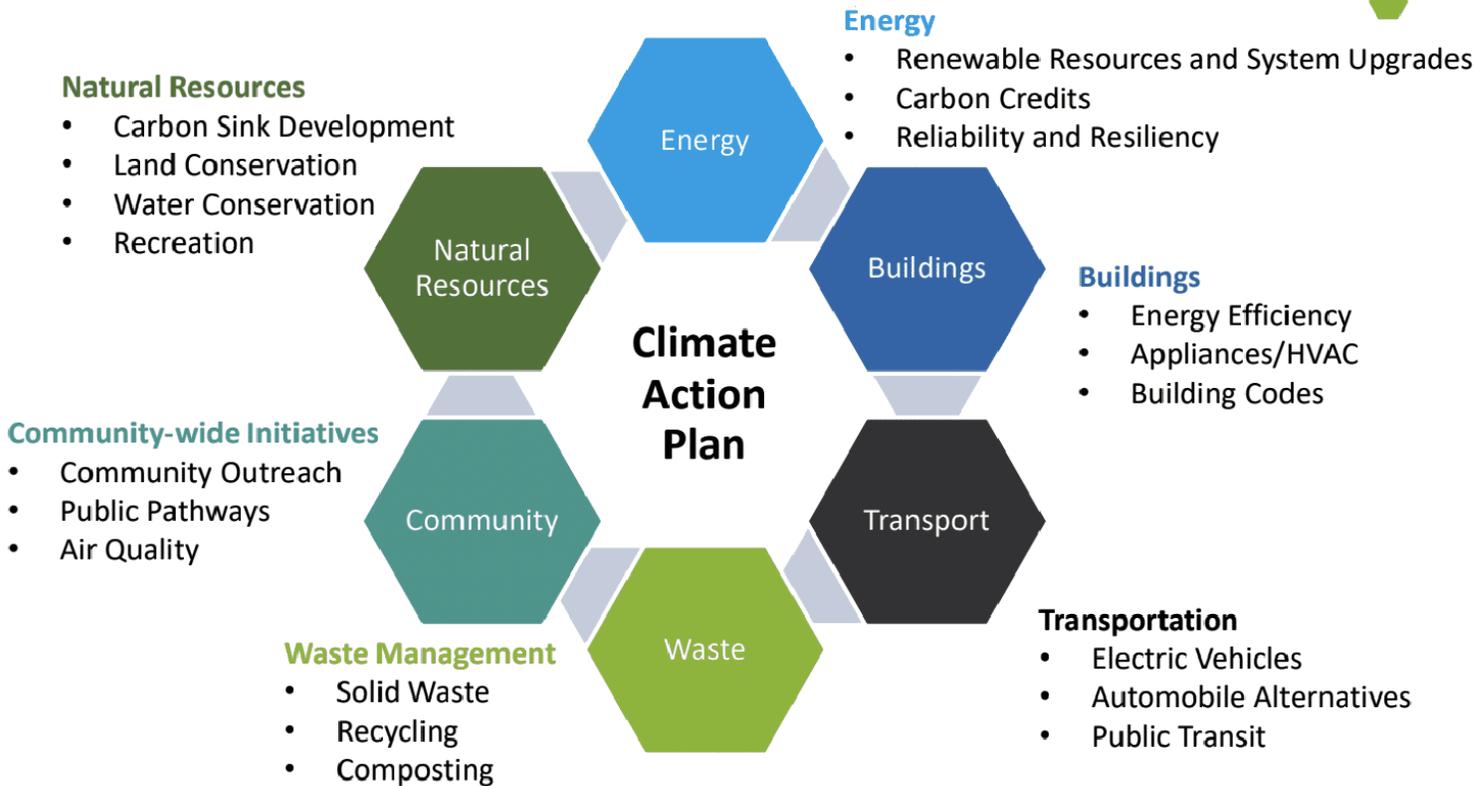
1. Inventory GHG Emissions
2. Adopt a target
3. Develop a Climate Action Plan (CAP)
4. Implement policies
5. Monitor and track progress (metrics)
6. Recognize achievements





MITIGATION: POLICY AND REGULATORY FRAMEWORKS

CORE SECTIONS OF A PROPOSED CLIMATE ACTION PLAN



CLIMATE ACTION PLANS (CAP)

At minimum, CAPs include an inventory of existing emissions, reduction goals or targets, and analyzed and prioritized reduction actions the following areas:

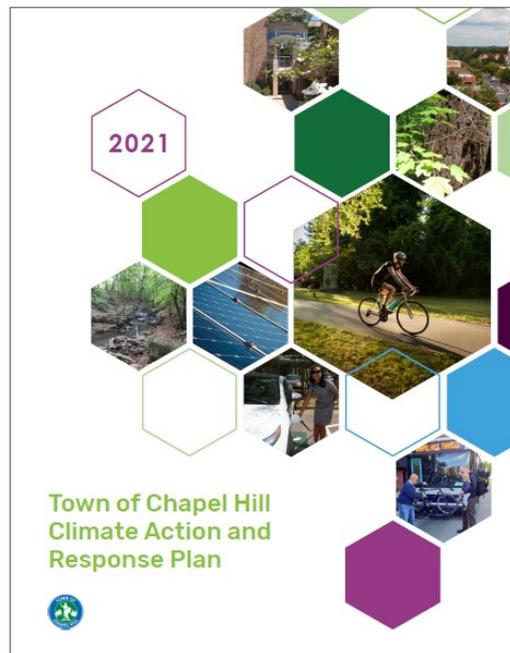
- Energy
- Agriculture and forestry
- Building optimization
- Transportation
- Waste materials & management
- Public engagement

MITIGATION POLICY AND REGULATORY FRAMEWORKS: CLIMATE ACTION PLANS (CAP)

CHAPEL HILL, NC CLIMATE ACTION AND RESPONSE PLAN (2021)

20 Actions spread across four (4)
primary Sectors/Focus Areas:

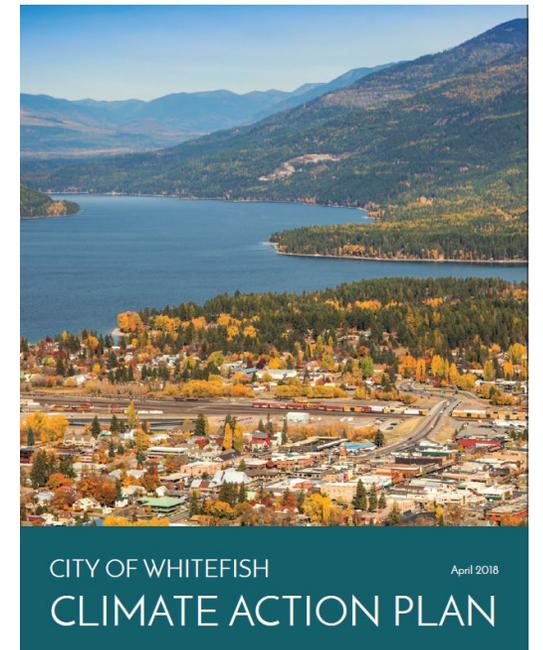
- Buildings and energy
- Transportation and land use
- Waste, water, and natural resources
- Resiliency



WHITEFISH, MT CLIMATE ACTION PLAN (2018)

Six (6) Focus Areas with a chapter on each
that documents social, economic, and
environmental benefits from climate
strategies:

- City buildings and energy
- Transportation and land use
- Water and wastewater
- Forest and watersheds
- Consumption, food, and waste
- School district





POLICY AND REGULATORY FRAMEWORKS: MITIGATION-ORIENTED ORDINANCES

MUNICIPAL ORDINANCES including zoning codes, can be geared toward mitigating the impacts of climate change through promoting reductions in GHG Emissions or methods for sequestering emissions; and may include:

- Cluster development
- Active transportation infrastructure
- Reduction in impervious surfaces
- Connected and accessible land uses
- Green city fleets and city infrastructure
- Commuter benefits programs
- Expanded and improved public transit service
- Reduction in VMT and GHG emissions
- High-performance, green building standards

MITIGATION POLICY AND REGULATORY FRAMEWORKS: GHG INVENTORIES

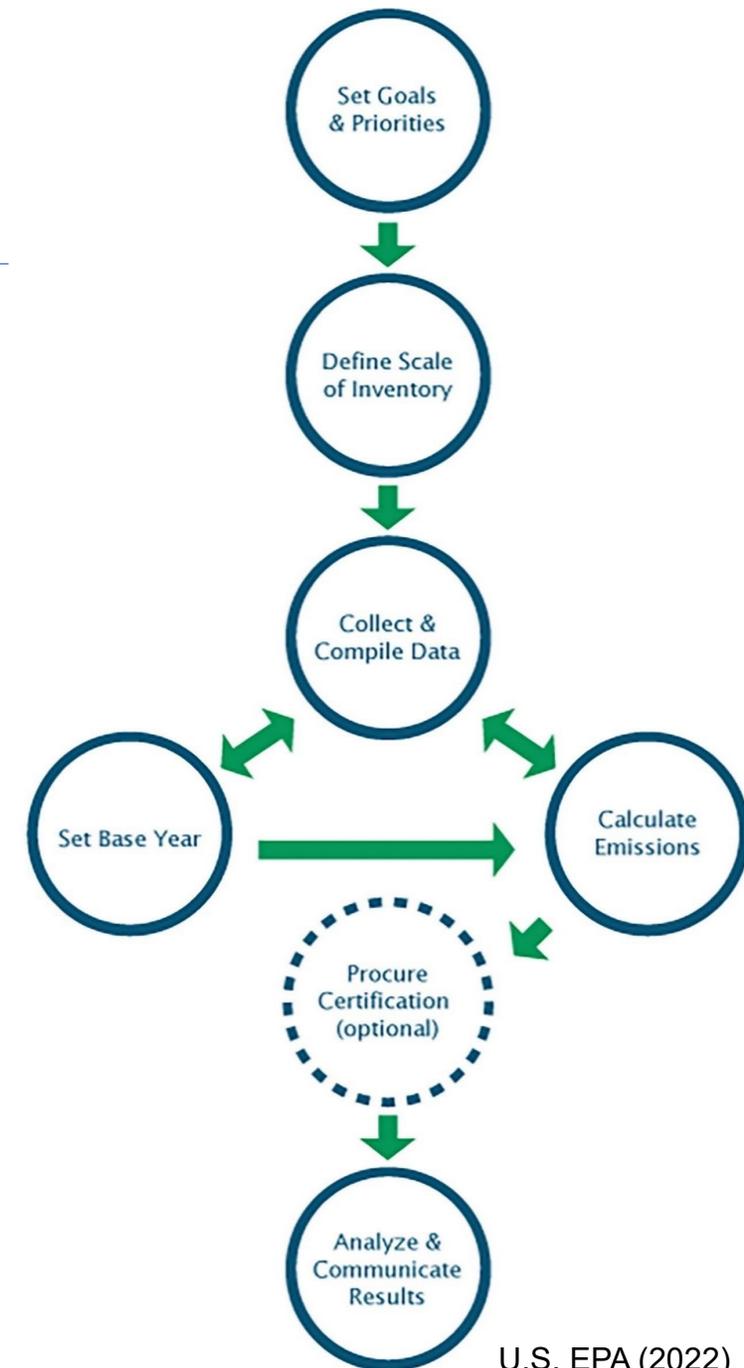
GHG INVENTORIES

Quantifies the amount of anthropogenic GHG Emissions and sources within a defined boundary over the course of a year.

- Local government operations
- Community-wide

GHG INVENTORIES enable communities to do the following steps:

1. Set Goals and Priorities
2. Define Scale of Inventory
3. Collect and compile data
4. Set Base Year
5. Calculate emissions
6. Procure Certification (optional)
7. Analyze and communicate results





ADAPTATION: EVALUATION AND MONITORING

ADAPTATION refers to:

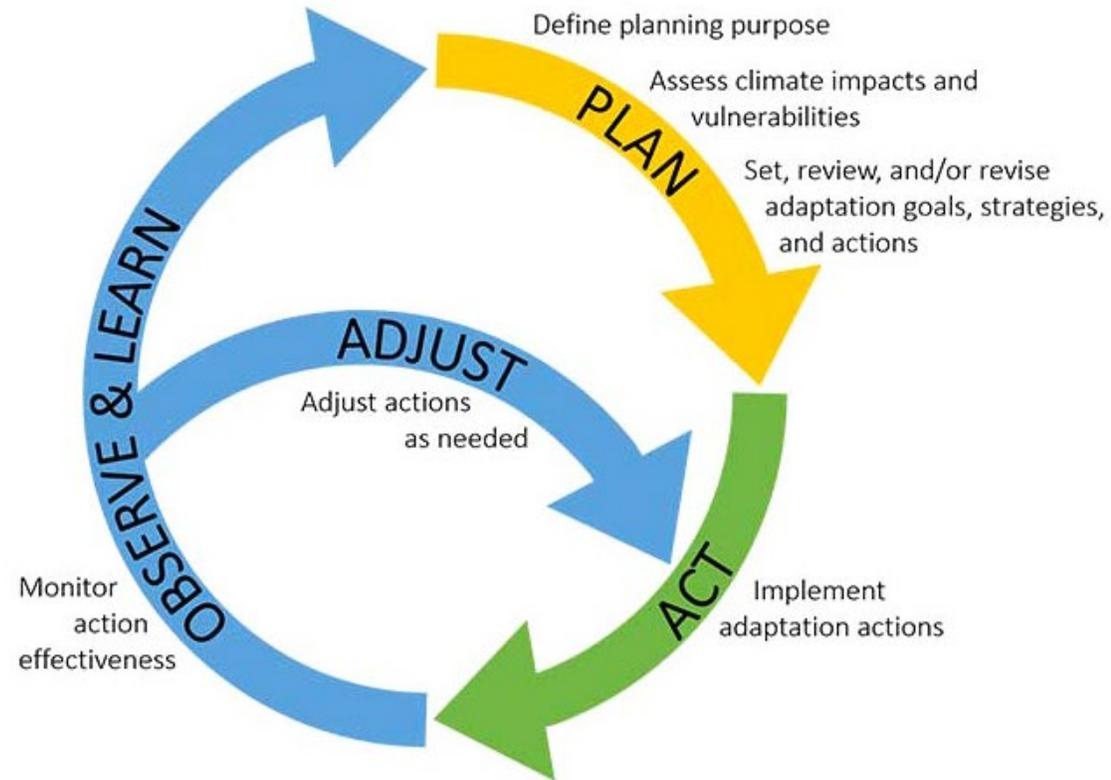
“The process of adjustment to actual or expected climate and its effects” (IPCC 2014)

CLIMATE RESILIENCE, or the ability of urban centers and the systems on which they depend, to anticipate, reduce, accommodate, and recover from the effects of a shock or chronic stressor in a timely and efficient manner.

ADAPTATION is not a one-time effort but an **ongoing** cycle of preparation, response, and revision.

- Plan
- Act
- Observe & learn
- Adjust

Climate Change Adaptation Cycle



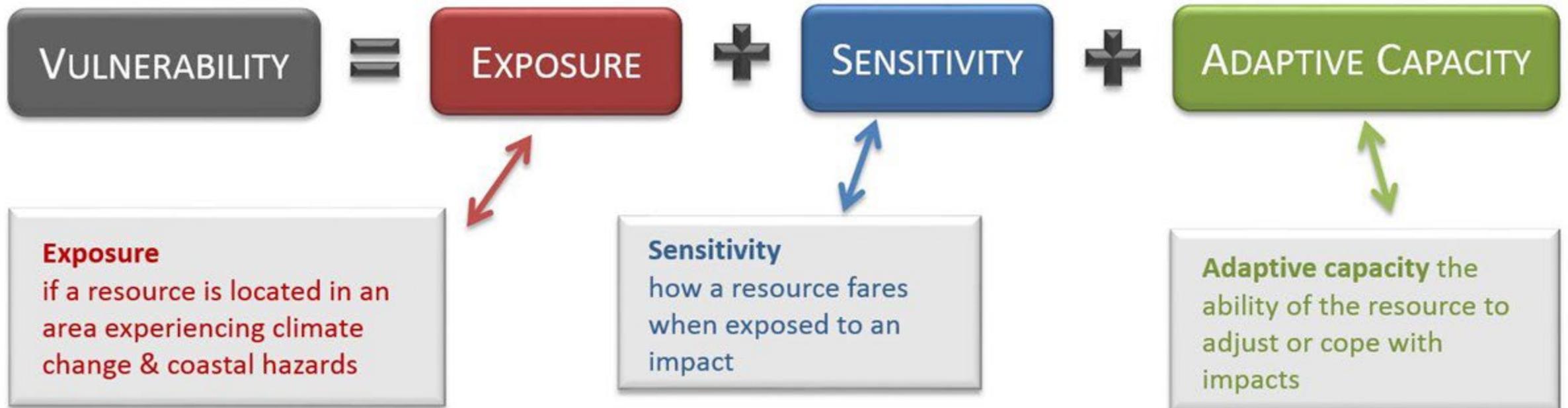
Countercurrents Collective (2019)

VULNERABILITY

VULNERABILITY IN THE CONTEXT OF CLIMATE CHANGE –

“the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes” (IPCC 2007).

VULNERABILITY is a function of the *character, magnitude, and rate* of climate change and variation to which a system is **exposed**, its **sensitivity**, and its **adaptive capacity** (CAFÉ, 2017):





ADAPTATION PRINCIPLES

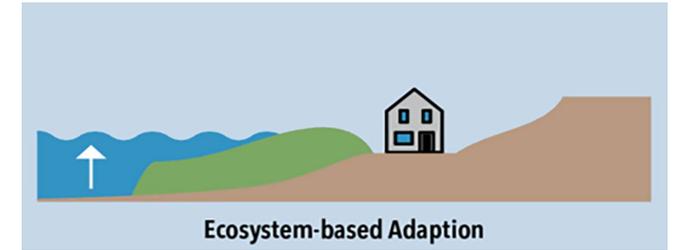
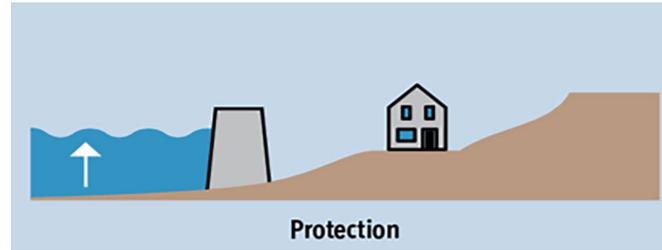
Planners should use the following **10 PRINCIPLES** to ensure adaptation actions result in beneficial outcomes for communities:

1. Address the anticipated impacts of climate change.
2. Systems Approach.
3. Adaptation Pathways.
4. Maladaptation: Avoid measures that increase vulnerability.
5. Maladaptation: Avoid shifting vulnerability from one sector or community to other locations.
6. Consider adaptation actions over a range of timeframes and spatial scales.
7. Equitable Adaptation.
8. Consistently build adaptive capacity.
9. Monitoring and evaluation of progress.
10. Integration of mitigation and adaptation actions.

ADAPTATION ACTIONS

ADAPTATION PLANNING: LIVING WITH CLIMATE CHANGE

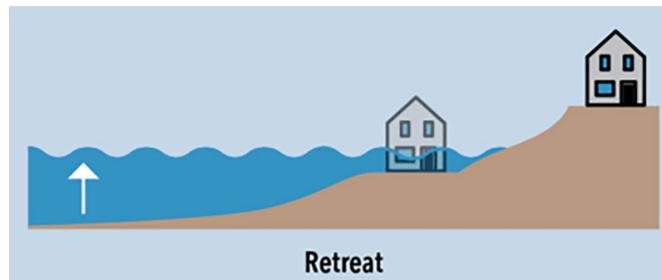
PROTECTION. Hard and soft structurally defensive measures to mitigate the impacts of a changing climate.



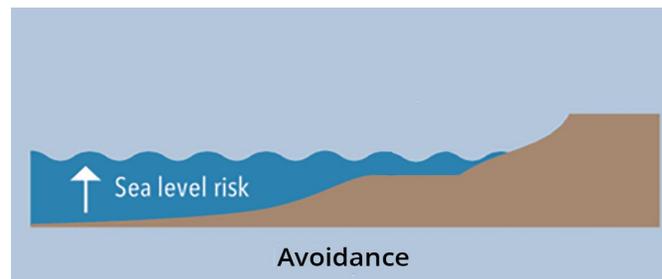
ACCOMMODATION. Altering physical design to allow a structure or land to stay in place despite changing conditions.



RETREAT. Removal of infrastructure or uses that cannot be easily protected or accommodated from a high-hazard area.



AVOIDANCE. Guiding new development away from areas that are at high risk from a changing climate.



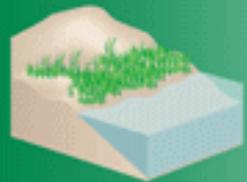
NATURE-BASED SOLUTIONS

HOW GREEN OR GRAY SHOULD YOUR SHORELINE SOLUTION BE?

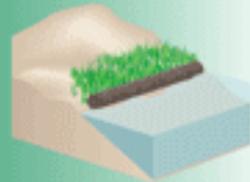
GREEN - SOFTER TECHNIQUES

GRAY - HARDER TECHNIQUES

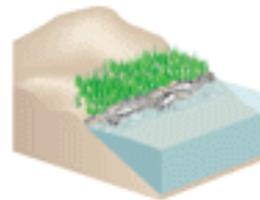
Living Shorelines



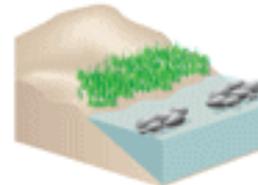
VEGETATION ONLY -
Provides a buffer to upland areas and breaks small waves. Suitable for low wave energy environments.



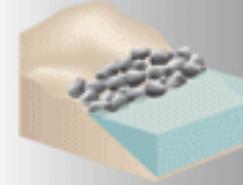
EDGING -
Added structure holds the toe of existing or vegetated slope in place. Suitable for most areas except high wave energy environments.



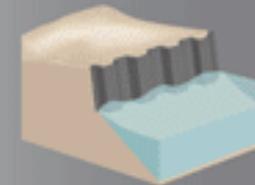
SILLS -
Parallel to vegetated shoreline, reduces wave energy, and prevents erosion. Suitable for most areas except high wave energy environments.



BREAKWATER -
(vegetation optional) - Offshore structures intended to break waves, reducing the force of wave action, and encourage sediment accretion. Suitable for most areas.



REVETMENT -
Lays over the slope of the shoreline and protects it from erosion and waves. Suitable for sites with existing hardened shoreline structures.



BULKHEAD -
Vertical wall parallel to the shoreline intended to hold soil in place. Suitable for high energy settings and sites with existing hard shoreline structures.

ADAPTATION: NATURE-BASED SOLUTIONS





IMPLEMENTING EQUITABLE ADAPTATION

The effects of climate change will disproportionately affect overburdened and low-income people and communities.

MARGINALIZED COMMUNITIES - "groups of people who face systemic disadvantages, exclusion, and barriers to opportunities, resources and power based on their identities"

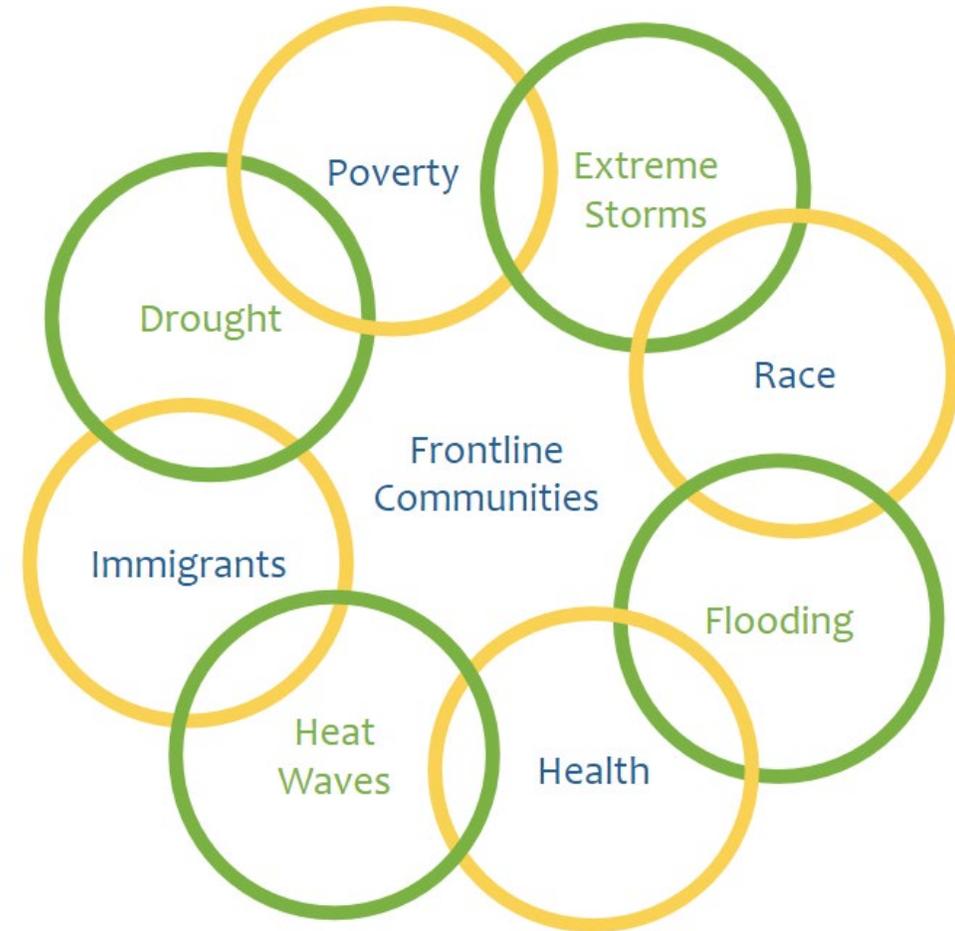
CLIMATE CHANGE AND DISPROPORTIONATE IMPACTS

Frontline Communities

- Geographic Context

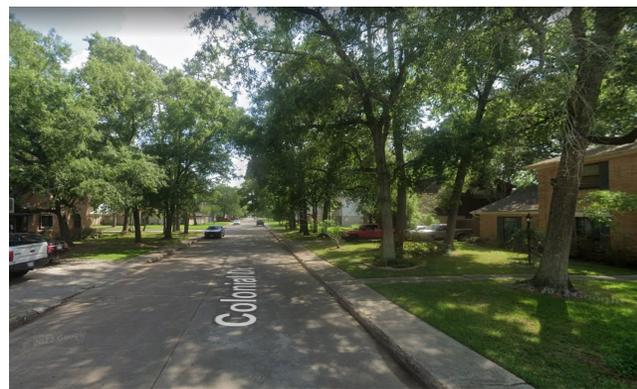
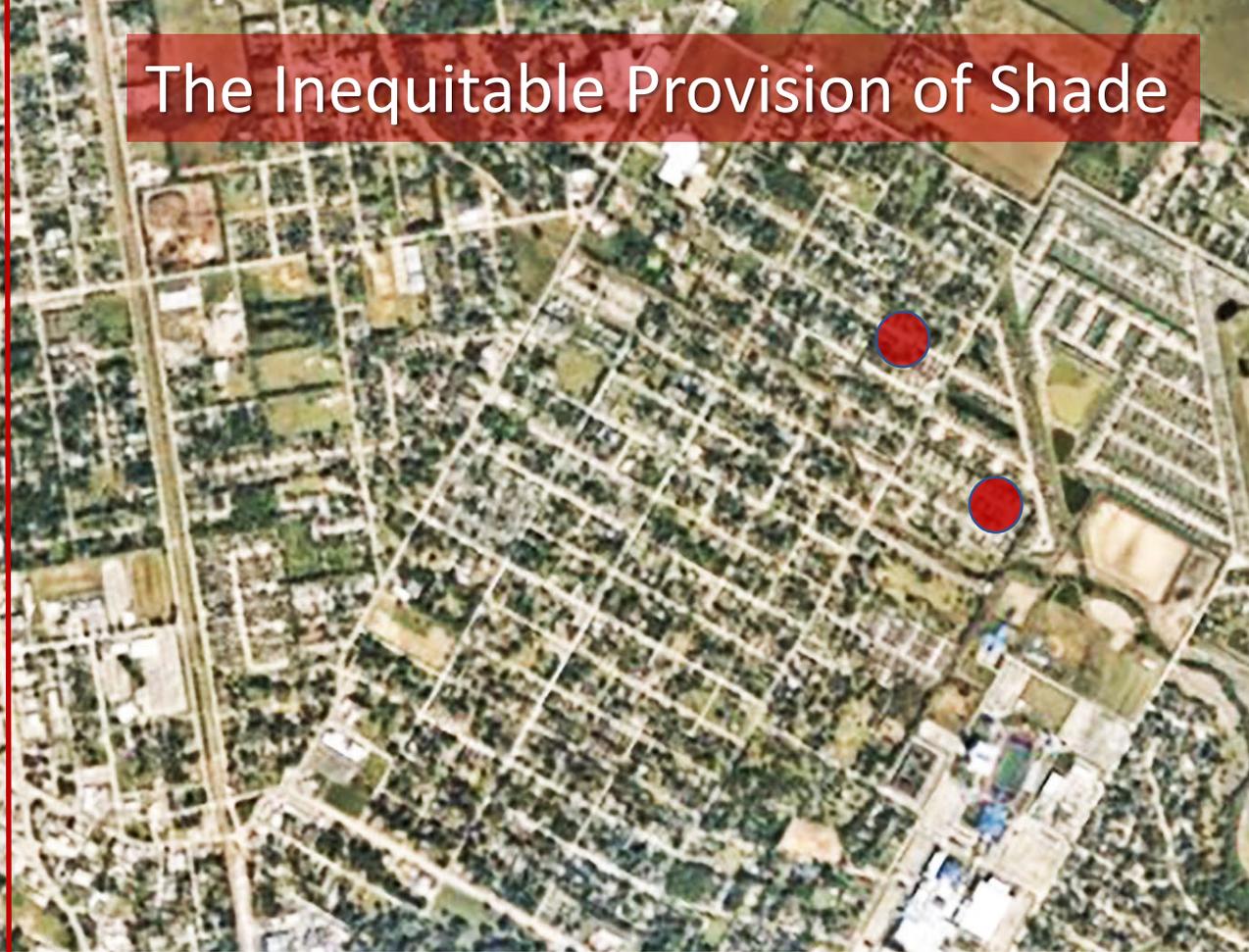
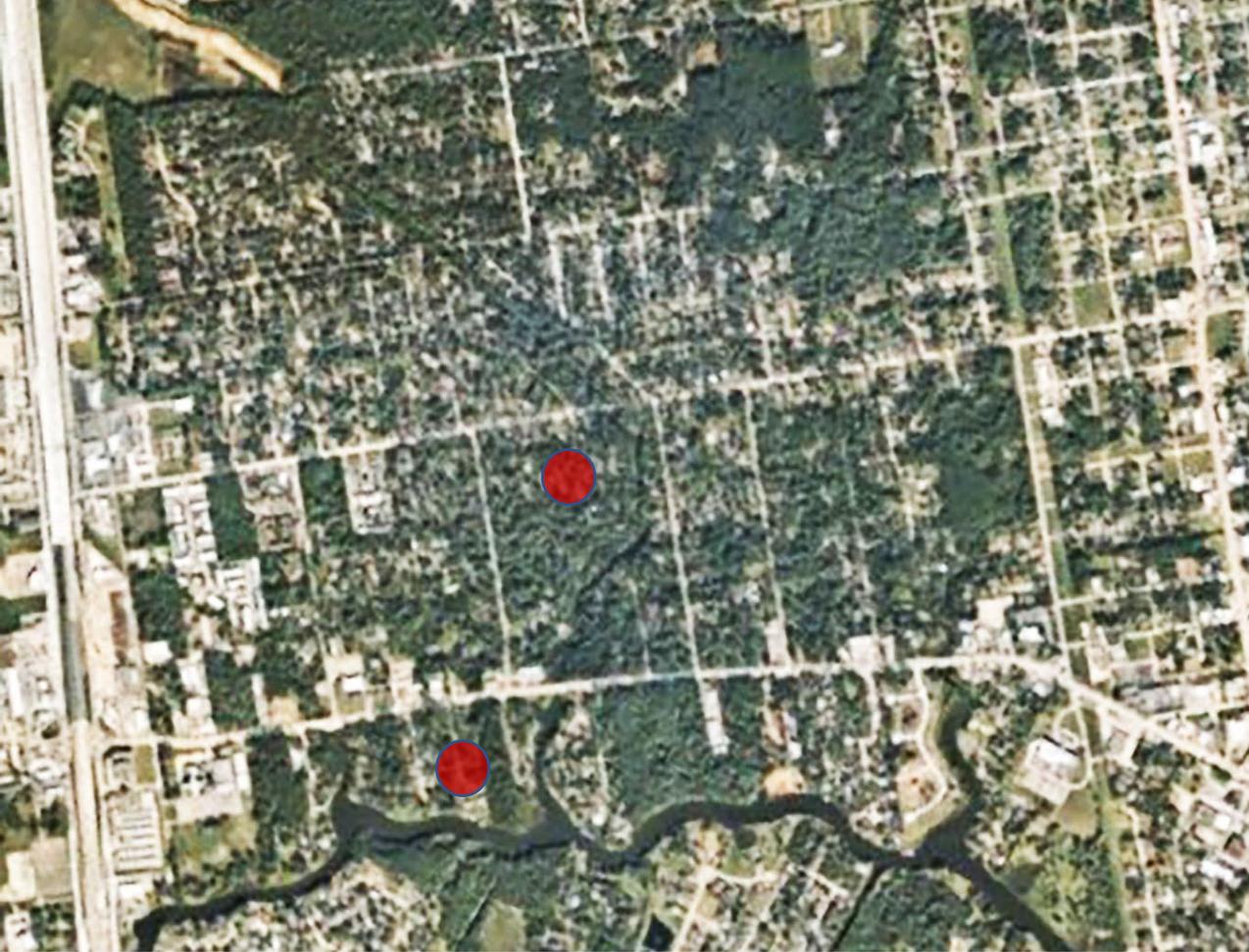
Centering Equity

- Inclusive Public Engagement
- Procedural Equity Substantive Equitable Outcomes

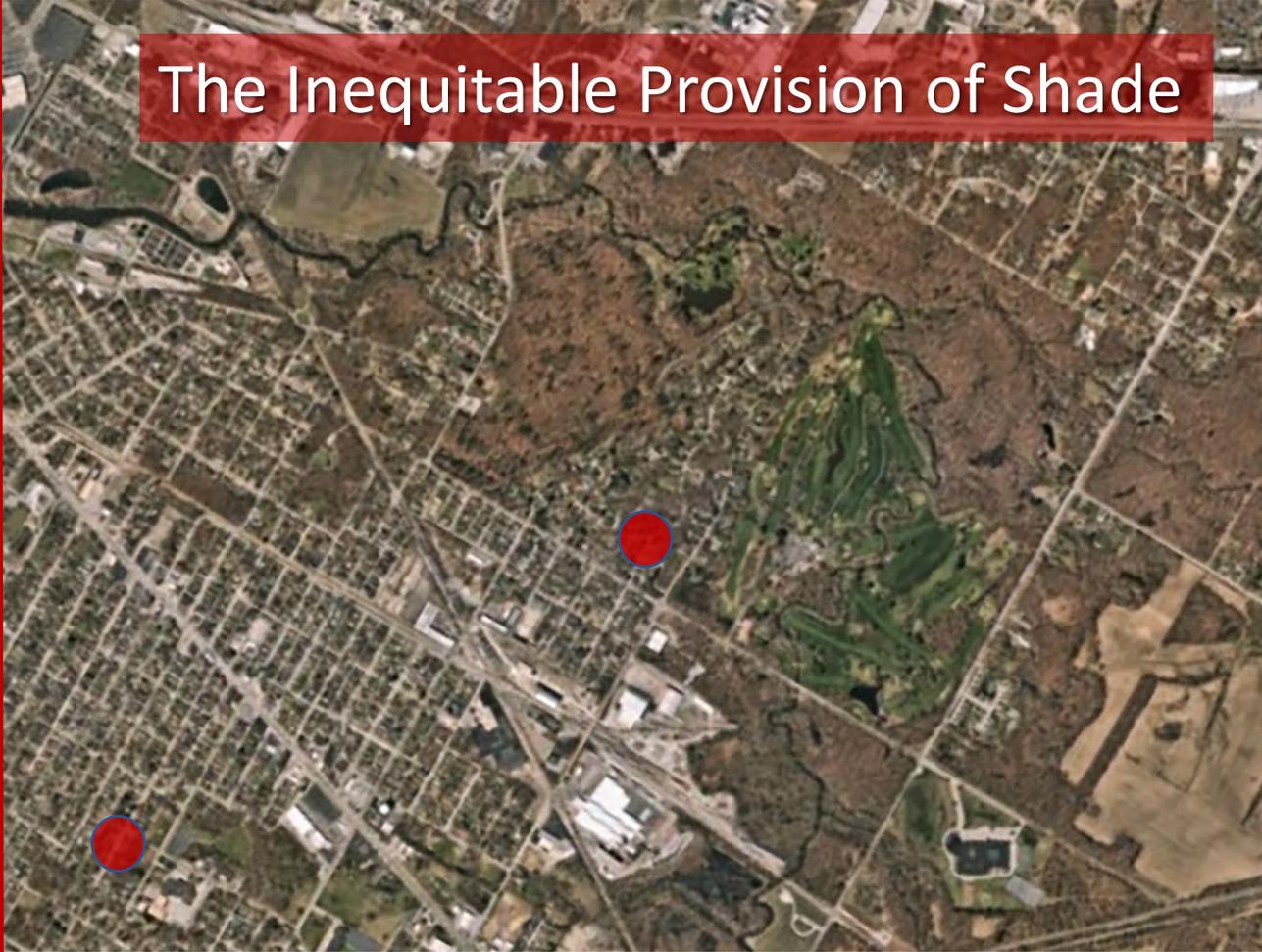
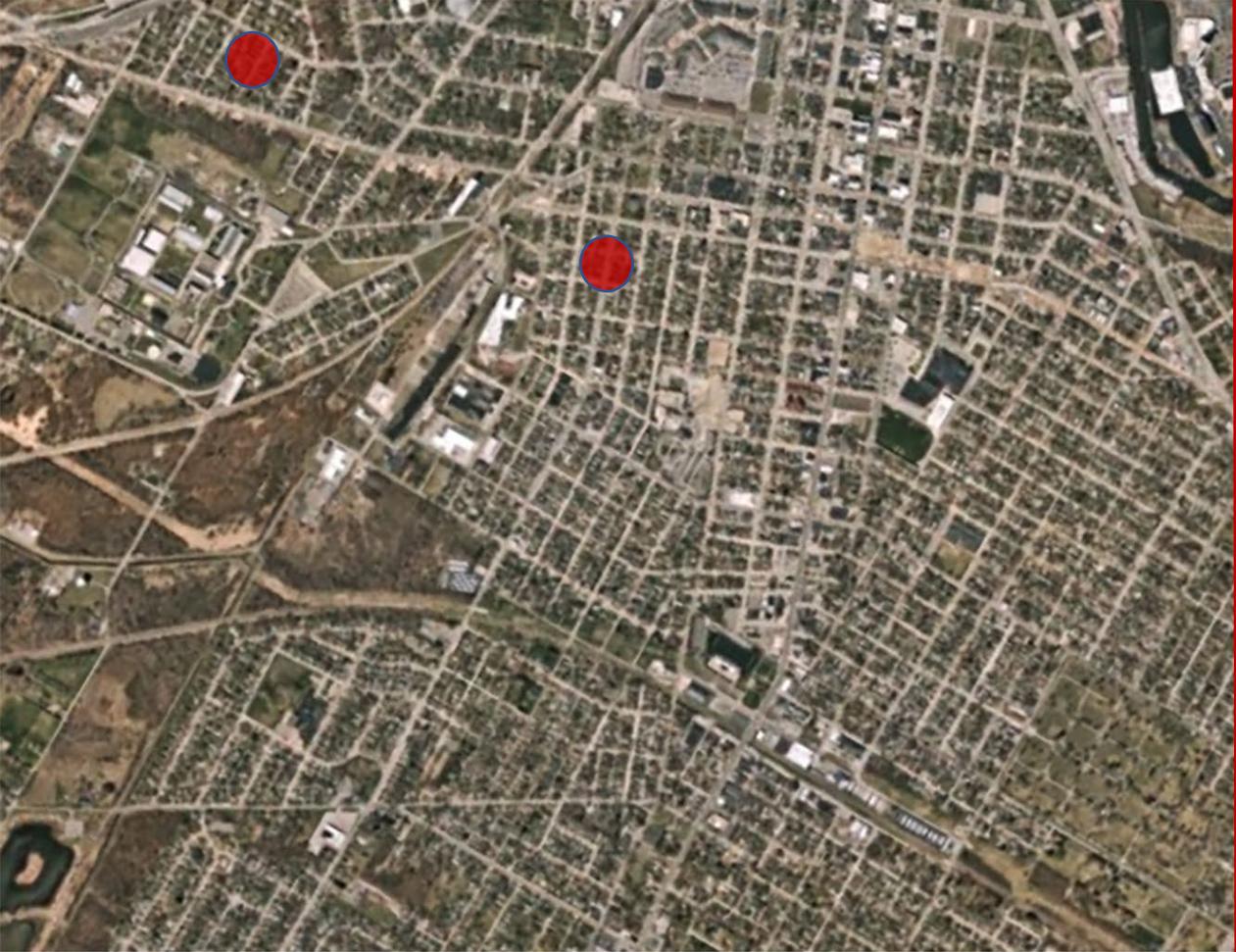




The Inequitable Provision of Shade



The Inequitable Provision of Shade





ADAPTATION POLICY AND REGULATORY FRAMEWORKS: COMPREHENSIVE PLANS

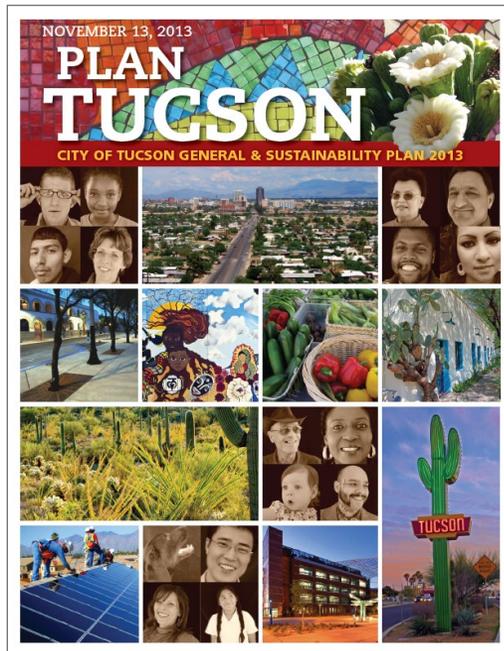
PLAN TUCSON

The Plan integrates sustainability principles into four (4) plan elements:

- Social Environment
- Economic Environment
- Natural Environment
- Built Environment

PLAN DRIVERS:

- Climate change
- Impact of extreme heat (UHI) on public health



NORTH-CENTRAL TEXAS COUNCIL OF GOVERNMENTS (NCTCOG) NORTH TEXAS 2050 PLAN

FOCUS AREAS:

- Carbon footprint monitoring indicators
- Promote renewable energy production through alternative energy markets
- Regional Integration of Sustainability Efforts (RISE) Coalition
- Mitigation / adaptation assistance cities, towns, and counties

PLAN DRIVERS:

- Naturally occurring disasters including fires, drought, flooding, tornadoes



TOOLS PLANNERS CAN USE TO ADVANCE CLIMATE POLICY

WHY PLANNERS?

- Planners have a comprehensive perspective
- Planners have a long-range outlook
- Planning is one of the few professions that focuses on place-based problems and opportunities affecting health, safety, and general welfare
- Planners are trained to spot and deal with unintended consequences and long-term cumulative impacts
- Planners have expertise in community engagement and consensus building
- Planners are often strategically well placed within a city, town, or county to take a collaborative or leading role on such issues



POLICY

“

A policy is a specific statement of principle or of guiding actions that implies clear commitment but is not mandatory. Can also be a general direction that a governmental agency sets to follow in order to meet its goals and objectives before undertaking an action program.

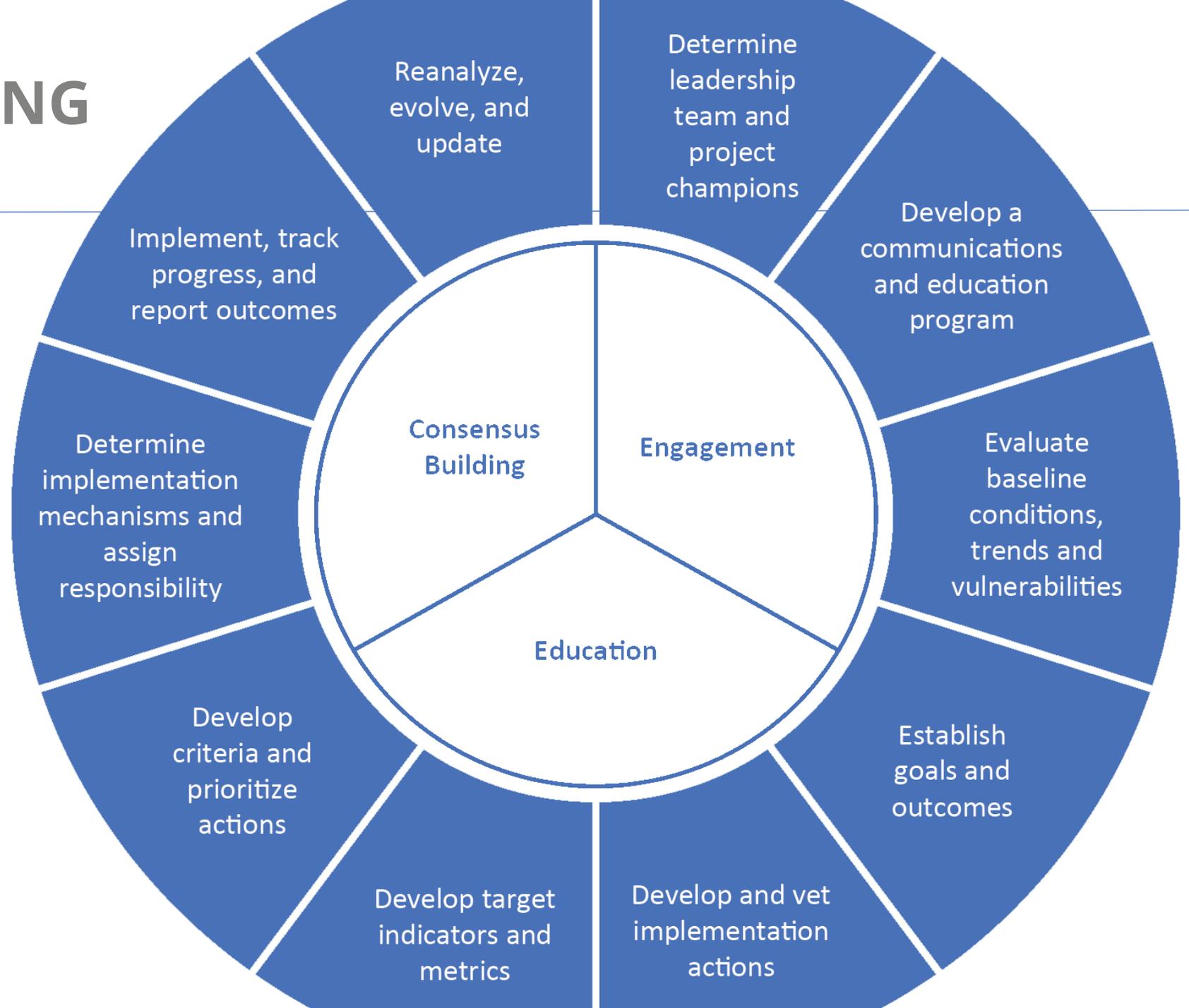
”

PRINCIPLES FOR CLIMATE ACTION

- Use whole systems thinking
- Plan and design for resilient and sustainable outcomes
- Develop diverse, flexible cross-sector strategies
- Prioritize for multi-benefit outcomes
- Integrate implementation and monitoring into the planning process
- Set ambitious, yet achievable goals
- Maximize the toolbox
- Engage, educate, and foster equity outcomes
- Build interdisciplinary partnerships and cross-sector collaboration
- Address vulnerabilities and uncertainties

CLIMATE PLANNING FRAMEWORK

- Engagement
- Education
- Consensus Building
- + 10 Steps



USING THE CASE STUDIES

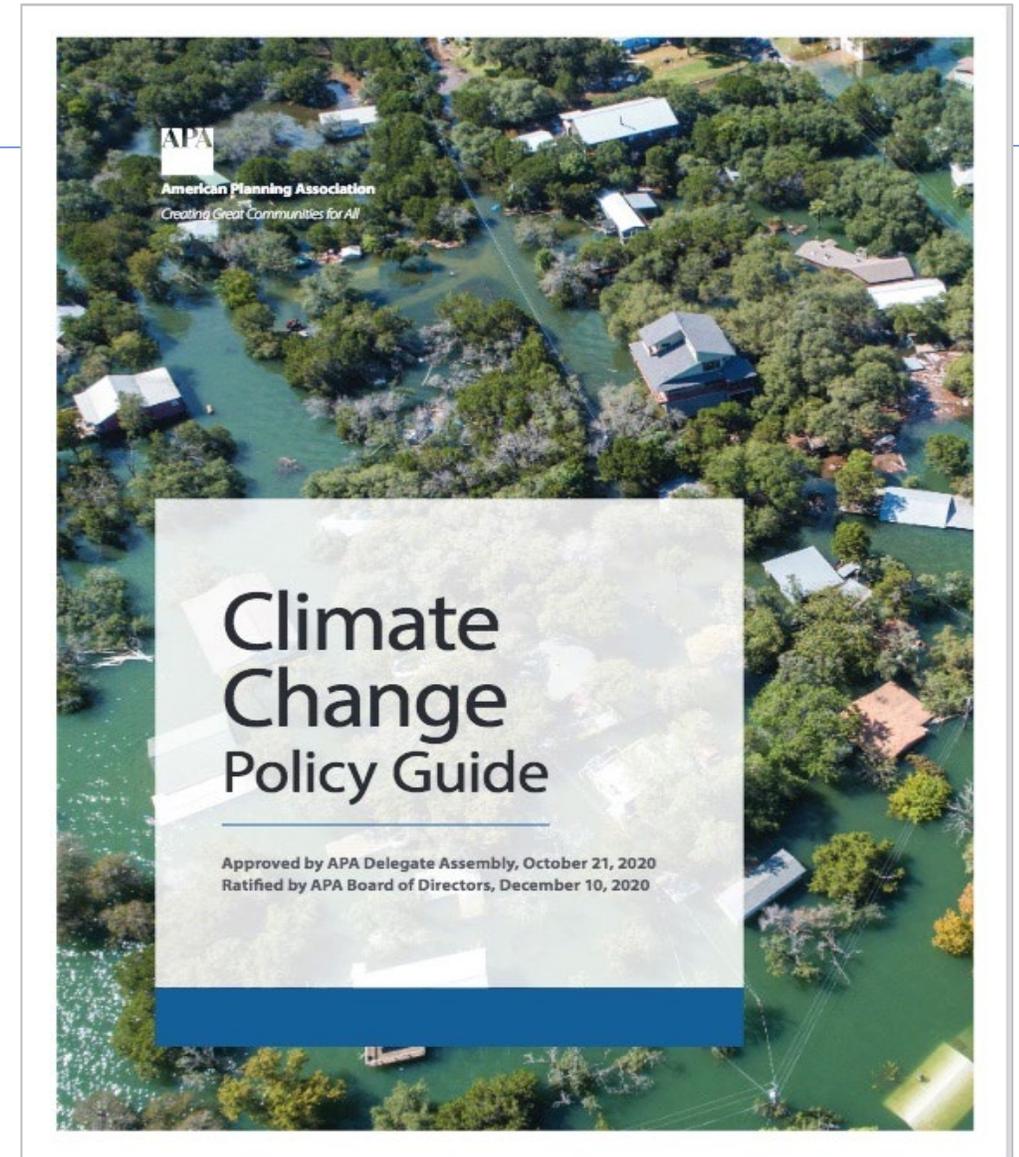
WHAT THEY INCLUDE:

- Background introductions
- Identification of regional significance and overview of climate issues
- Key takeaways
- Embedded hyperlinks to a ton of resources, including:
 - » plans of all shapes and sizes
 - » goals and policies
 - » vulnerability assessments
 - » mapping tools
 - » resolutions & ordinances
 - » brochures
 - » coalition efforts & networks



CLIMATE CHANGE POLICY GUIDE

- Replaces the 2008 Policy Guide on Planning and Climate
- Represents APA's official position on critical planning issues
- Organized by the six APA Sustainability Comprehensive Plan Standards categories:
 - » Livable Built Environment
 - » Harmony with Nature
 - » Resilient Economy
 - » Interwoven Equity
 - » Healthy Communities
 - » Responsible Regionalism
- Separate category focused on needed federal and state policies



CLIMATE CHANGE POLICY GUIDE

INCLUDES:

- 7 General Policy Statements (with explanation)
- 51 Specific Policy Statements (with explanation)
- 253 supporting strategies to achieve the intended policy outcome (with explanation)

EX.

HWN C.4: Promote Solid Waste Reduction

- Support life-cycle materials management
- Promote waste prevention
- Promote reuse of materials
- Promote the expansion of recycling
- Promote the expansion of composting and waste-to-energy generation

C. Harmony with Nature

The natural environment encompasses all living and nonliving things occurring naturally on earth. Ecosystems are natural communities formed by the interaction of plants, animals, and microbes (living), with air, water, and soil (nonliving). These interactions create many benefits to the natural environment such as nutrient cycling, carbon sequestration and storage, erosion protection, and pollination, to name a few. These benefits are referred to as ecosystem services.

Climate change is having significant impacts on these natural ecosystems and ecosystem services. Rising sea levels alter the salinity of low-lying coastal marshes, increased droughts and wildfires are altering the habitat of many plant and animal species, and rising temperatures are altering climate zones and expanding the range of certain species and reducing the range of others. These changes lead to the displacement of humans, plants, and animals and increase the prevalence of invasive species and pests that can have devastating impacts on natural ecosystems. Changes to the natural environment are also increasing the transmission of vector-borne diseases and impacting the health and wellness of both human and wildlife populations as they struggle to adapt.

Protection and management of natural resources, ecosystems, and ecosystem services has become a critical tool in combating climate change and protecting and developing healthy and sustainable environments for all species. The earth's natural ecosystems not only sequester carbon, they support the hydrological cycle and reduce flooding, regulate temperature, and support every living thing, including plants, bacteria, animals, and humans—collectively referred to as "biodiversity." Adapting natural systems to help respond to future climate change impacts will require renewed focus on agricultural, natural resources, and ecosystem management techniques. Understanding and incorporating biodiversity and ecosystem services into all aspects of planning is essential to ensure that plans, policies, and guidelines that support conservation and development practices are in harmony with the natural environment. An interdisciplinary approach is necessary due to the scale and complexity of the issues. Planners will need to consult with experts and practitioners in ecosystem management, agriculture, forestry, and public health in order to develop effective plans to guide development that is in harmony with nature and that will help combat climate change.

GENERAL POLICY C—HARMONY WITH NATURE

The American Planning Association and its Chapters and Divisions support planning policies and strategies that integrate natural systems thinking into all planning decisions. We strive to ensure that the contributions of natural resources to human well-being are explicitly recognized and valued and that maintaining their health is a primary means to help mitigate and adapt to a changing climate.

SPECIFIC POLICIES

Harmony with Nature Policy C.1. Enact policies to reduce GHG emissions

GHGs from human activities have a significant impact on the natural environment. From resource extraction and processing to energy generation, transmission, and consumption, the way we plan, develop, and operate the built environment has a direct impact on the amount of greenhouse gas we emit. The current rate of CO₂ emissions in the atmosphere is greater than the rate of absorption by the natural environment, creating an imbalance in the carbon cycle which is contributing to anthropogenic climate change and negative impacts to land, air, water, and all inhabitants. This rapid environmental degradation is the result of unsustainable consumption and production patterns which are compounding the impacts of climate change. The following strategies should be employed to achieve this policy outcome:

- C.1.1 Develop GHG inventories, analysis methods, and action plans.** All levels of government should adopt goals and targets for reducing GHG emissions and seek to identify and quantify those emissions. Where emissions cannot be precisely quantified, plans should discuss the impacts of recommended measures for reducing GHG emissions on a qualitative basis. Climate planning elements should be incorporated into comprehensive plans, public investments, regulations and incentives, and environmental and development review processes.
- C.1.2 Support energy and water conservation.** Support energy and water conservation in all planning and development processes to reduce indirect habitat loss from resource extraction and pollution to land, water, and air resources. Promote district and decentralized energy systems to improve energy efficiency and resiliency and reduce energy loss during transmission. These efforts will protect existing natural resources to help rebalance the carbon cycle, preserve water resources, and reduce GHG emissions.
- C.1.3 Promote a circular economy.** Incorporate life-cycle cost analyses into planning processes and look beyond first costs. Design all developments and infrastructure for disassembly and reuse or recycling (cradle to cradle).
- C.1.4 Eliminate waste.** Create regulations that require developers to mimic natural systems in the built environment, to the extent practical, by designing for reuse through regenerative design processes, using waste as a resource and achieving a climate positive/carbon negative result.

OTHER CLIMATE TOOLS

DATA COLLECTION PROCESS GUIDE

- A guide for municipalities in documenting energy and climate existing conditions and for creating indicators

Sector

All Data Collection

Buildings

Renewable Resources

Transportation

Demographic Information

Waste

Existing Policies and Plans

DEVELOPMENT REVIEW CHECKLIST

- Communities can customize the Development Review Checklist to their own specific climate goals
- Categories include:
 - » Commercial Industrial Efficiency
 - » Electric Grid Mix
 - » Renewable Energy
 - » Electrification and Fuels
 - » Residential Efficiency
 - » Transportation Strategies
 - » Waste Strategies

CLIMATE ORDINANCE INVENTORY

- Model climate ordinances and example ordinance language
- Searchable Web Tool
- Filter by topics

The screenshot shows the Climate Ordinance Inventory web tool interface. It includes filter sections for 'Filter by Type', 'Filter by Population', 'Filter by Sector', and a search bar. Below the filters is a table with columns for Name, Topic, Author, Example Language, and Location. The table lists various model ordinances and example language from different states and organizations.

Name	Topic	Author	Example Language	Location
Model Solar Zoning Ordinance for New Hampshire	Solar	New Hampshire Sustainable Energy Association	--	New Hampshire
Model Small-Scale Solar Siting Ordinance	Solar	Columbia Law School Center for Climate Change Law	--	Nation
Model Solar Zoning Ordinance for Kentucky	Solar	Kentucky Resources Council	--	Kentucky
Model Solar Zoning Ordinance for Georgia	Solar	Emory Law School, Georgia Institute of Technology, and University of Georgia	--	Georgia
Model Solar Energy Local Law - New York State Solar Guidebook	Solar	NYSERDA	--	New York
Model Ordinance - Solar Tax Exemption	Solar	Virginia Department of Environmental Quality	--	Virginia
Model Utility, Community, & Residential Scale Wind Energy Ordinance	Wind	Virginia Department of Environmental Quality	--	Virginia

PAS REPORT APPENDICES – OTHER RESOURCES

APPENDIX A: GLOSSARY OF TERMS

- Consistent terms from industry references and other APA resources

**+ 250 LINKS TO
ONLINE RESOURCES
USED THROUGHOUT
THE PAS REPORT**

APPENDIX B: APA CLIMATE RESOURCES

- Past PAS Reports
 - » Brief summary of top six (6) PAS Reports dealing with climate change
 - » Highlights climate-specific references from an additional 18 PAS reports since 2010
 - » * Does not include the recently adopted PAS Report 600: Planning for Urban Heat Resilience
- Past Policy Guides
 - » Brief summary of top four (4) Policy Guides dealing with climate change
 - » Additional five (5) policy guides which include climate references

APPENDIX C: CLIMATE STRATEGIES

- 14 pages of mitigation and adaptation strategies both structural (i.e., changes to the built environment) and nonstructural (i.e., policies and regulations) across eight sectors:
 - » energy
 - » Transportation
 - » land use
 - » infrastructure
 - » buildings
 - » waste management
 - » natural systems
 - » public health

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PLANNER'S COMMITMENT

1. Get educated
2. Talk about it
3. Network
4. Promote policy and take action

