

Community Climate Resilience

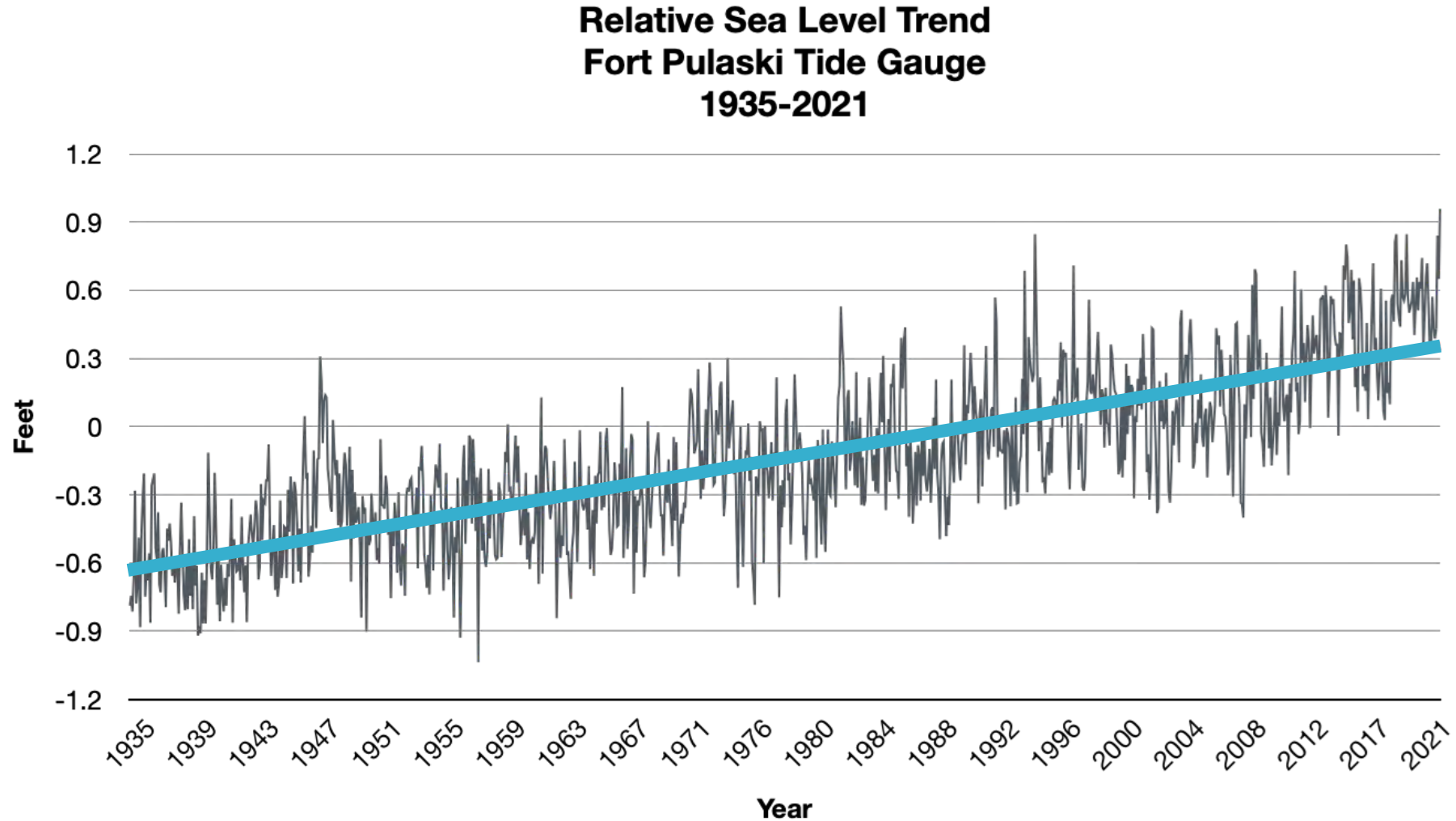
Kait Morano

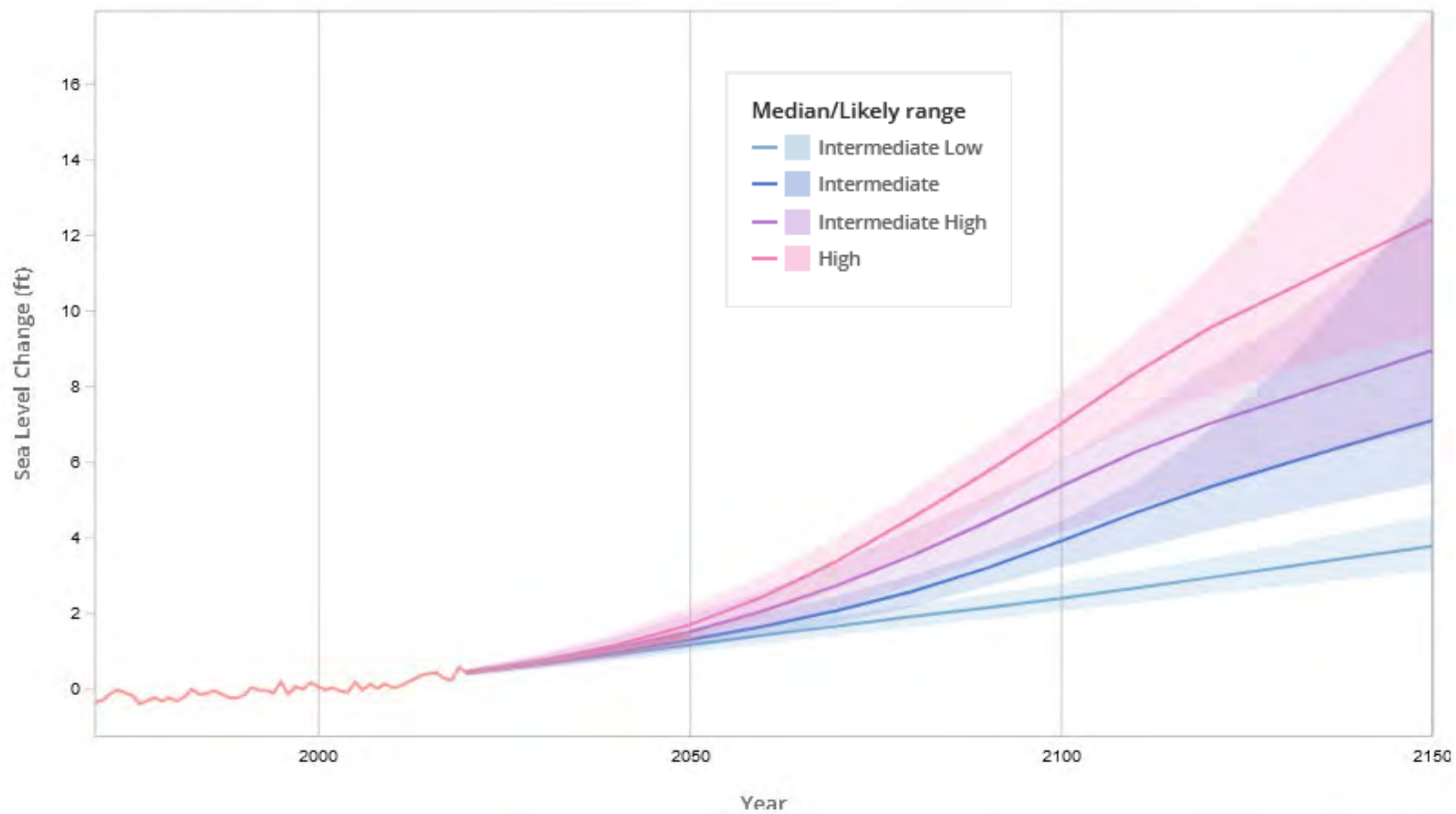
Senior Planner

Chatham County – Savannah Metropolitan Planning Commission



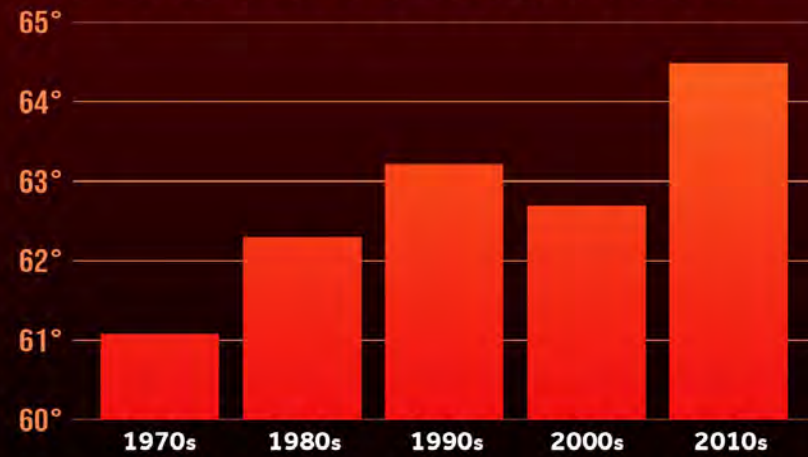
Climate change is already happening







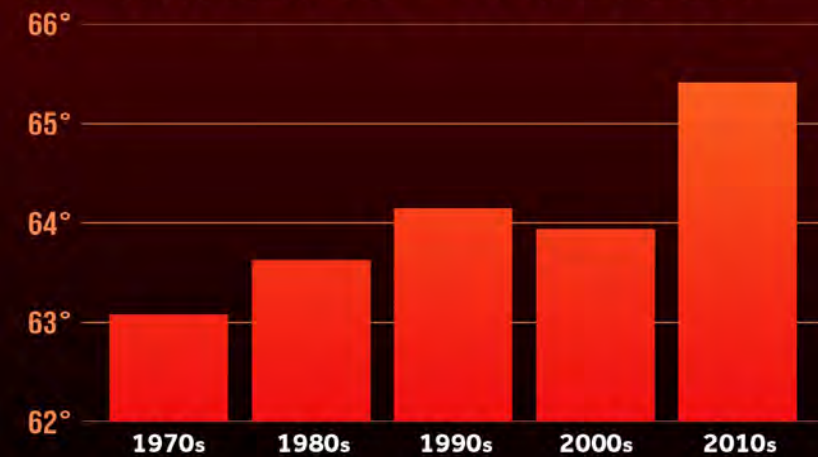
ATLANTA DECADES OF WARMING



Average decadal temperature (°F). Data through 12/1/2019.
Source: RCC-ACIS.org

CLIMATE CENTRAL

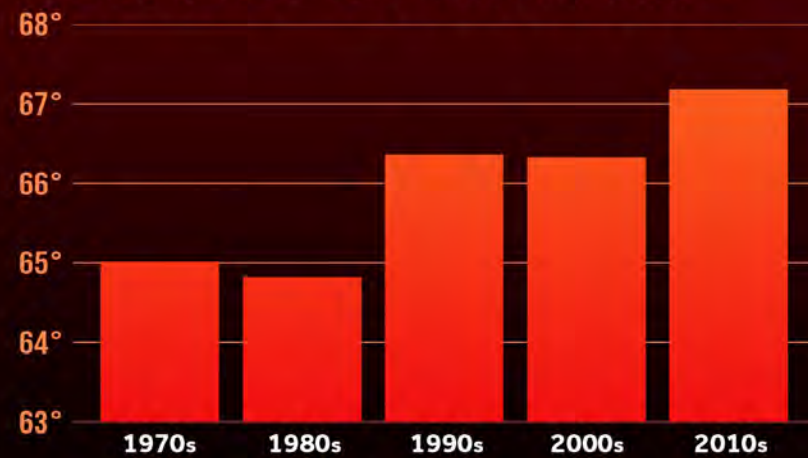
AUGUSTA DECADES OF WARMING



Average decadal temperature (°F). Data through 12/1/2019.
Source: RCC-ACIS.org

CLIMATE CENTRAL

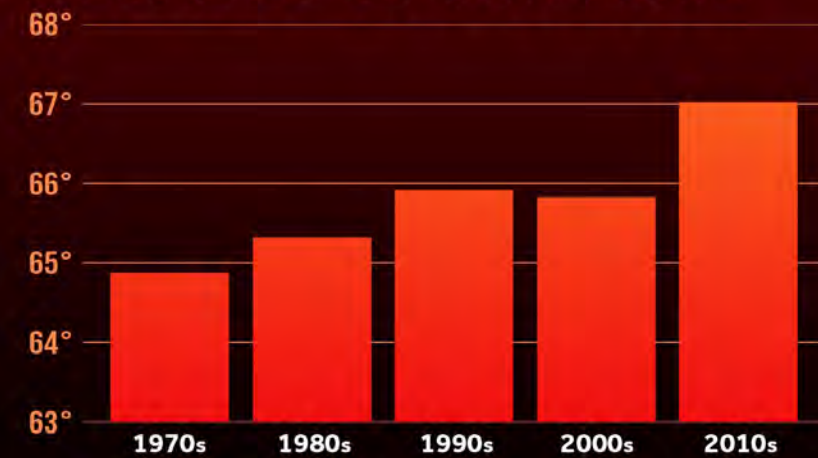
ALBANY, GA DECADES OF WARMING



Average decadal temperature (°F). Data through 12/1/2019.
Source: RCC-ACIS.org

CLIMATE CENTRAL

COLUMBUS, GA DECADES OF WARMING



Average decadal temperature (°F). Data through 12/1/2019.
Source: RCC-ACIS.org

CLIMATE CENTRAL

ATLANTA
DAYS
ABOVE 95°



Day count based on rate of change since 1970
Source: RCC-ACIS.org -- Applied Climate Information System

CLIMATE  CENTRAL

ALBANY
DAYS
ABOVE 95°

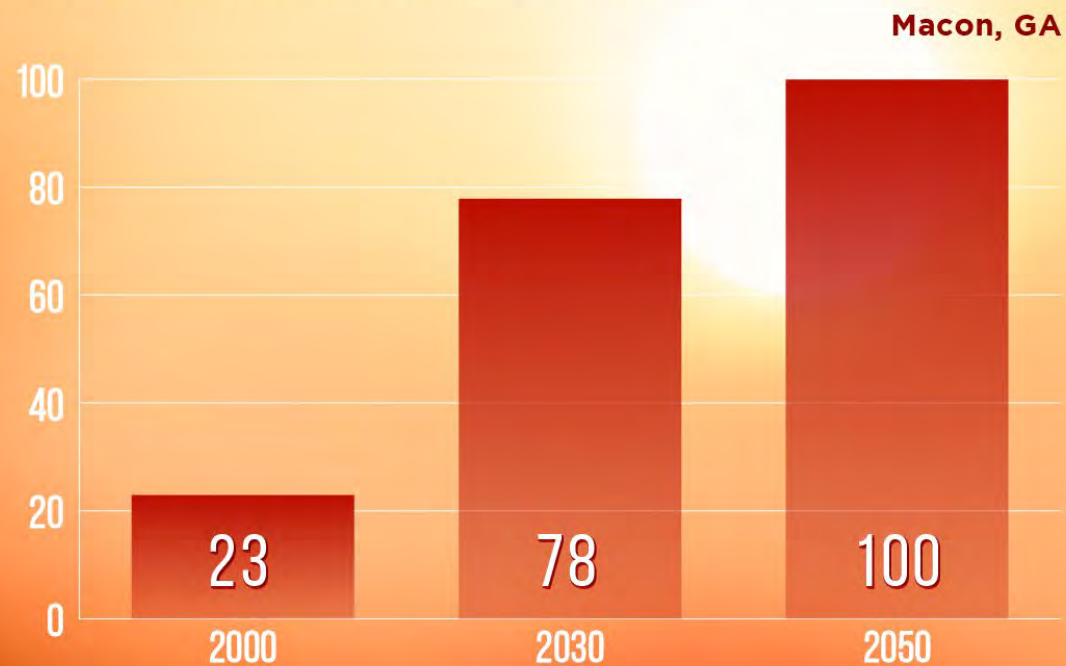


Day count based on rate of change since 1970
Source: RCC-ACIS.org -- Applied Climate Information System

CLIMATE  CENTRAL

MORE DANGER DAYS

HEAT INDEX ABOVE 105°



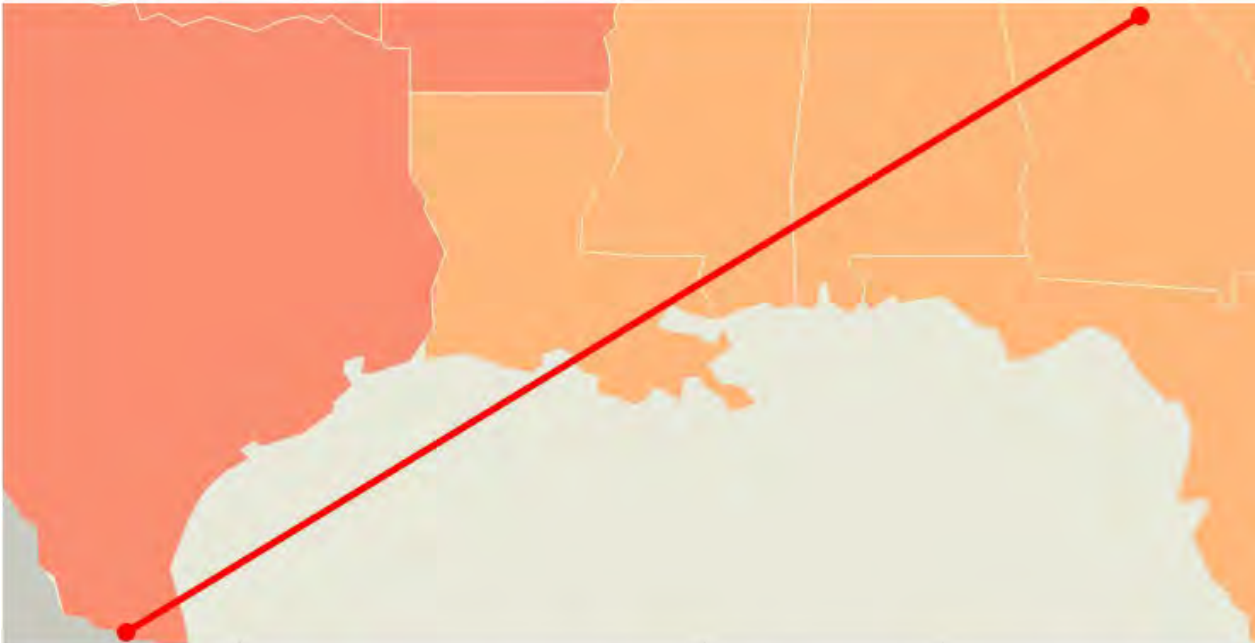
Annual average danger day count based on current emissions trends.
Projected temp and humidity: Climate Central analysis of CMIP5 multi-model ensemble dataset.

CLIMATE  CENTRAL

... and it's going to get worse.

I live in Athens-Clarke, GA

I live in Valdosta, GA

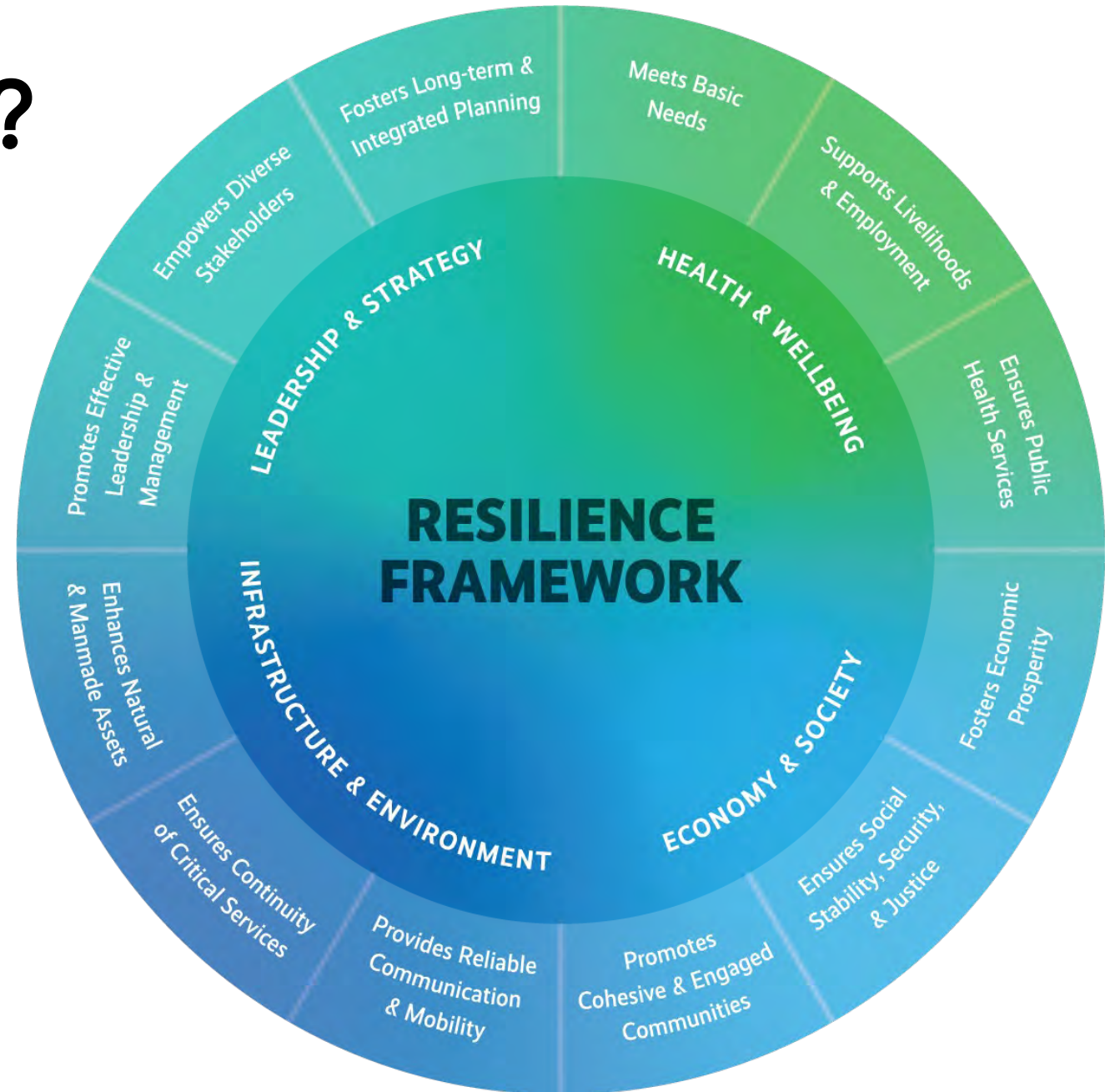


By 2100 summers in	ATHENS-CLARKE, GA 88.77 °F	will be like summers now in	PHARR, TX 96.69 °F
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By 2100 summers in	VALDOSTA, GA 91.49 °F	will be like summers now in	LAREDO, TX 100.18 °F
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What is Resilience?

The ability of a community to anticipate, prepare for, mitigate, adapt to, and recover from both extreme disturbances and persistent stress.

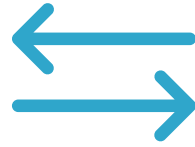


Qualities of Resilient Communities



Reflective

able to learn



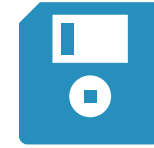
Resourceful

can easily repurpose
resources



Robust

limit spread of failure



Redundant

have backup capacity



Flexible

have alternative
strategies



Inclusive

broad consultation &
communication



Integrated

systems & communities
work together

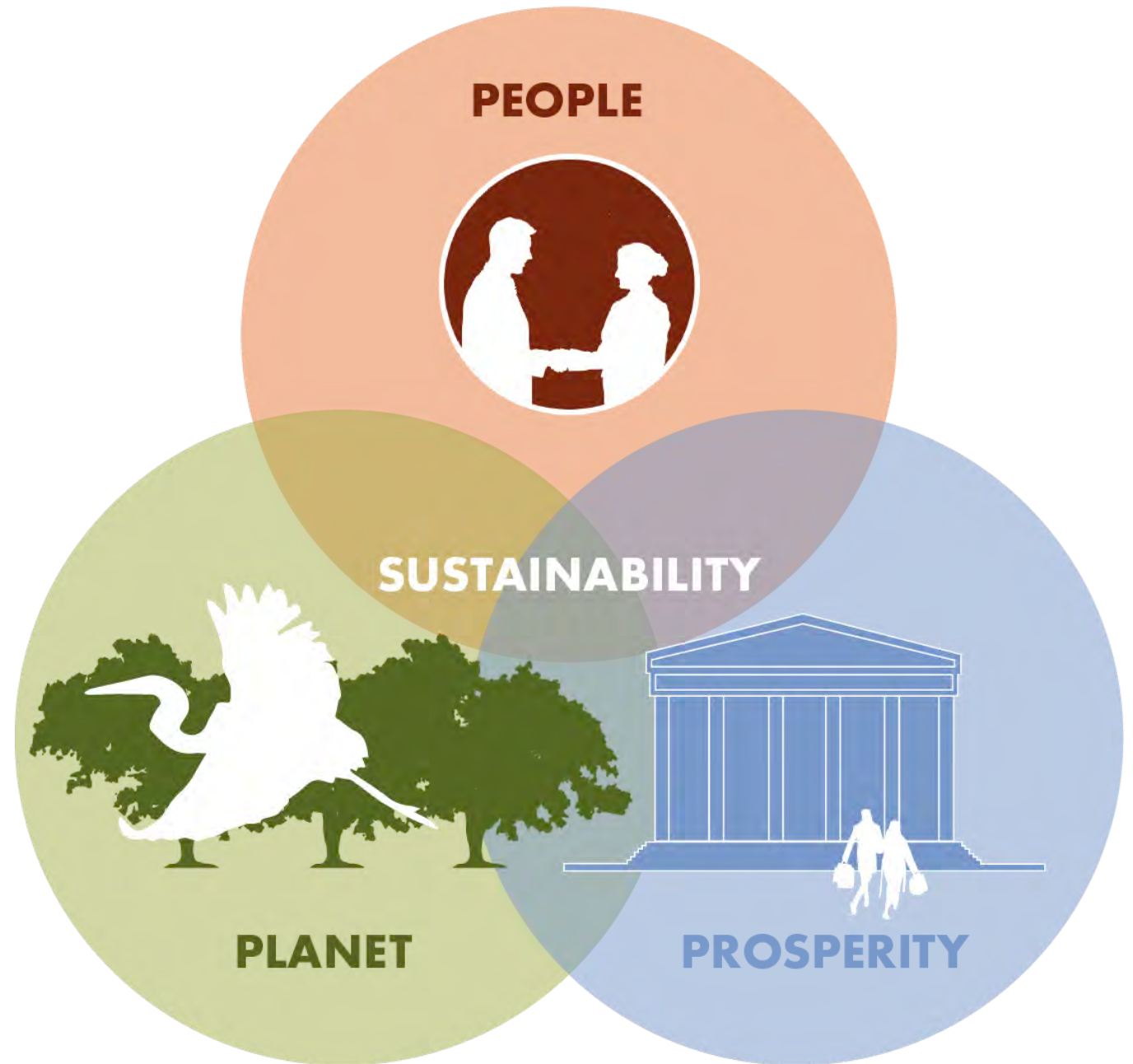
The Triple Bottom Line

Goals

people, or
community
development

planet, or
environmental
sensitivity

profit, or
economic
development



Build from Existing Tools

COMPREHENSIVE PLAN

A comprehensive plan is required by the Georgia Planning Act (O.C.G.A. 45-12-200, et seq., and 50-8-1, et seq.) for any local government to be eligible to receive state funding or permits. This plan serves as the basis for the exercise of many local government powers, particularly the power to zone land and regulate land development. Among other things, the plan states a community's vision of the future, identifies local priorities, and includes maps that show areas for future development. Incorporating community resilience ideas into the comprehensive plan is a great way to initiate programs and policies to improve community resilience.

FUTURE LAND USE MAP

Usually developed as part of a comprehensive plan, a community's future land use (FLU) map describes the areas that are envisioned for future growth and development, and it describes the character of that development. The FLU is meant to inform land use decisions such as zoning and granting development permits, as well as driving investment in infrastructure such as roads, water systems, sewer systems, and stormwater infrastructure. Incorporating community resilience into future development patterns and styles of development can avoid substantial future risks.

SERVICE DELIVERY STRATEGY

A service delivery strategy is required in Georgia by the Service Delivery Act, O.C.G.A. 36-70-20, and it describes how the cities and the county government in a single county should work together to provide local services. This minimizes the duplication of services and limits competition between local governments. The strategy also provides a mechanism for resolving disputes over local government service delivery, funding, and land use. The service delivery strategy can significantly impact the way land development occurs, and plans to protect or enhance community resilience should involve all affected local governments. Thus, how government services will be provided under the service delivery strategy needs to be considered.

ZONING, SUBDIVISION, AND LAND DEVELOPMENT ORDINANCES

Zoning ordinances establish permissible types of development and requirements for lots and buildings. Subdivision and land development ordinances regulate how development sites and buildings are constructed. These regulations may be compiled into a single code section, or they may be separate ordinances. These ordinances can promote both green and natural infrastructure by determining the allowable impervious surfaces, building footprints, and similar measures.

FLOOD DAMAGE PREVENTION ORDINANCE

Also frequently called a floodplain management ordinance, this type of ordinance sets standards for development in areas identified as having a high risk of flooding. Such an ordinance is required for areas shown on the local FIRM in order for community members to be eligible to buy federally backed flood insurance policies through the NFIP, though more extensive regulation is allowed. These ordinances can promote both green and natural infrastructure by requiring more intensive stormwater management in flood-prone areas and by preserving undeveloped land and natural areas in high-risk floodplains.

DRAINAGE CONTROL/ STORMWATER MANAGEMENT ORDINANCE

Drainage control and stormwater management ordinances regulate the quantity and sometimes the quality of postconstruction stormwater runoff. For urbanized areas, state and federal requirements set minimum requirements for the ordinances, which are increasingly incorporating green infrastructure practices. Local governments can also exceed the minimum state and federal requirements. This is one of the most direct means to incorporate green infrastructure practices into development and improve community resilience.

STORMWATER MANAGEMENT PLAN

Communities with MS4 permits are required under the federal Clean Water Act to develop and adopt a stormwater management plan that details the actions they will take to comply with the conditions of the permit. These actions can include adopting or updating ordinances, conducting site inspections, maintaining and improving infrastructure, and developing environmental education, programs, etc.

EROSION CONTROL ORDINANCE

Usually adopted to meet minimum requirements in the state Erosion and Sediment Control Act, these ordinances require practices to reduce erosion from construction sites, and they require riparian buffers along state waters. Local governments may exceed the state minimum standards, and many do. These regulations can help control runoff, and the buffer requirements promote the protection of ecologically valuable open space that is also important for resilience.

DUNES/ShORELINE PROTECTION ORDINANCE

These ordinances prohibit activities destructive to sand dunes, which provide a defense against coast flooding. This type of local ordinance is enacted in addition to state law and regulations under Georgia's Shore Protection Act. It can exceed the state requirements, or it can allow local enforcement of the state-level standards.

LAND CLEARING AND TREE PROTECTION ORDINANCE

These ordinances require landscape vegetation controls during land-clearing activities. They also prioritize preserving existing trees and may require minimum replanting standards. Some also promote the conservation of native and/or ecologically important trees or tree species. Maintaining the existing tree canopy and promoting an urban tree canopy can enhance the evapotranspiration of stormwater and reduce the impacts of runoff, while also providing numerous other resilience benefits.

PLANNED USE DEVELOPMENT ORDINANCE

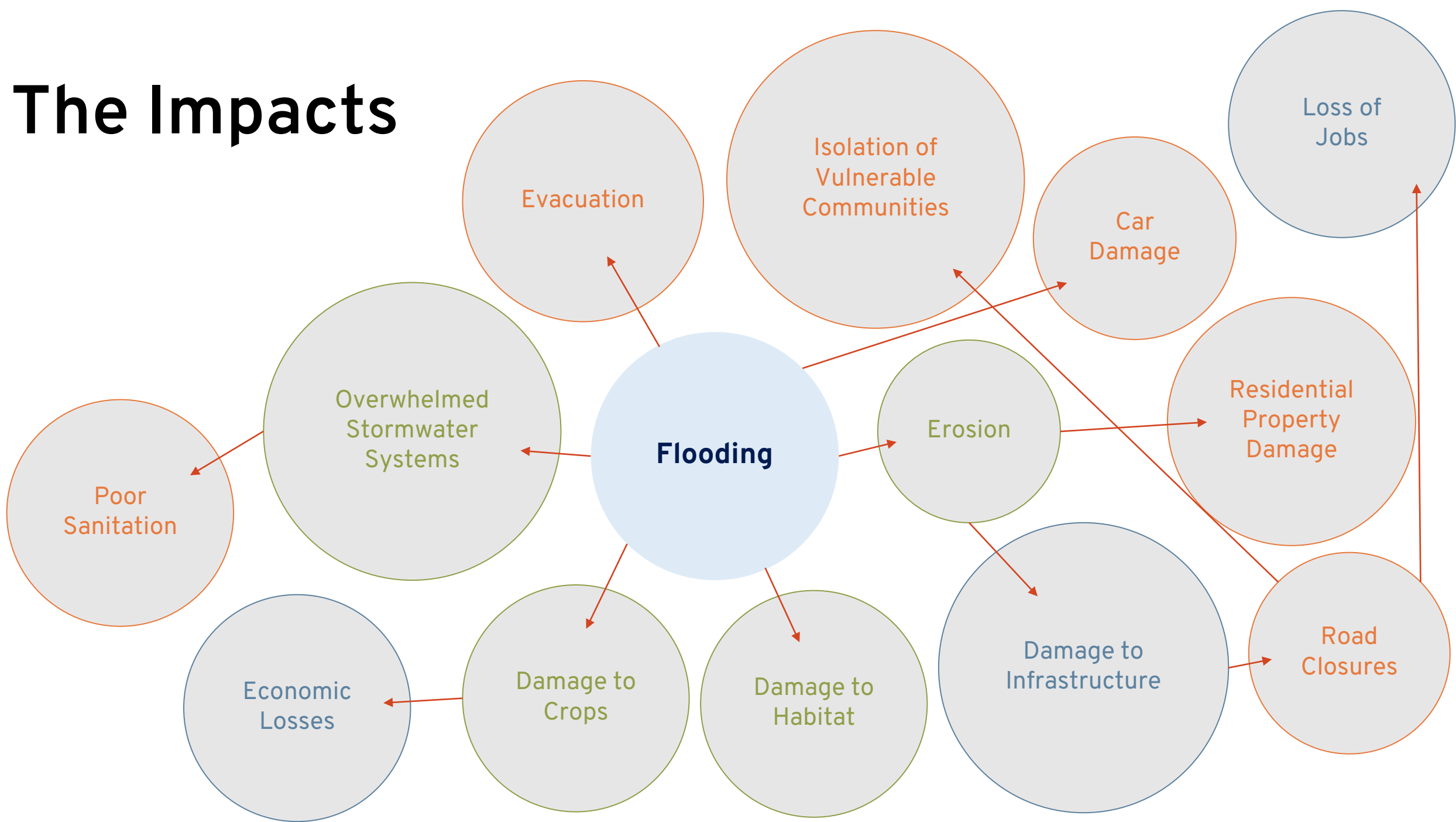
These ordinances allow greater flexibility in development by promoting the use of low-impact development practices such as cluster development, mixing of uses, and alternative, environmentally focused lot designs. These regulations can reduce the overall footprint of a development as well as protect primary conservation areas, preserve open space, allow reduced road widths, and promote other impervious cover reductions.

The Problem

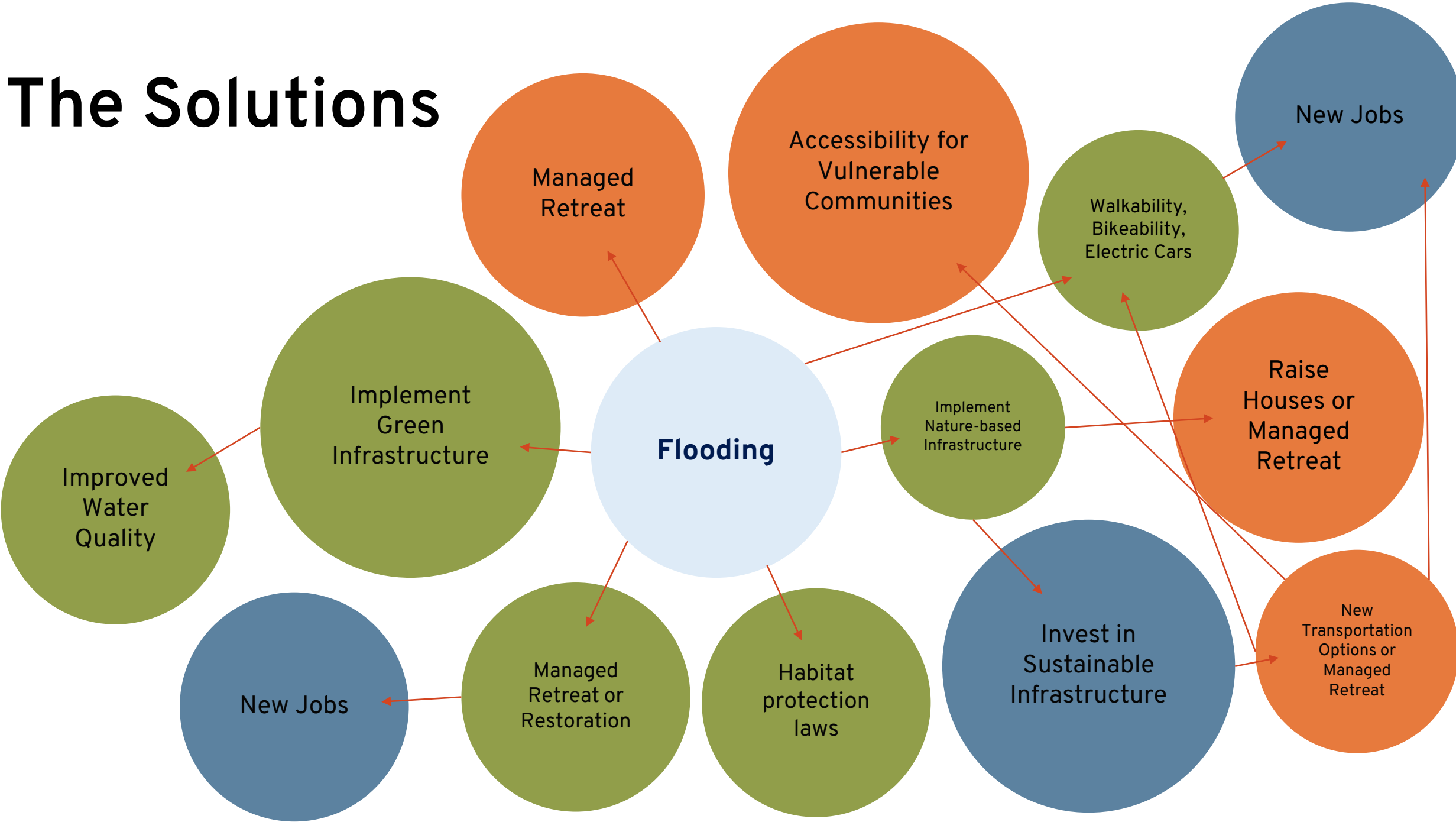


Flooding

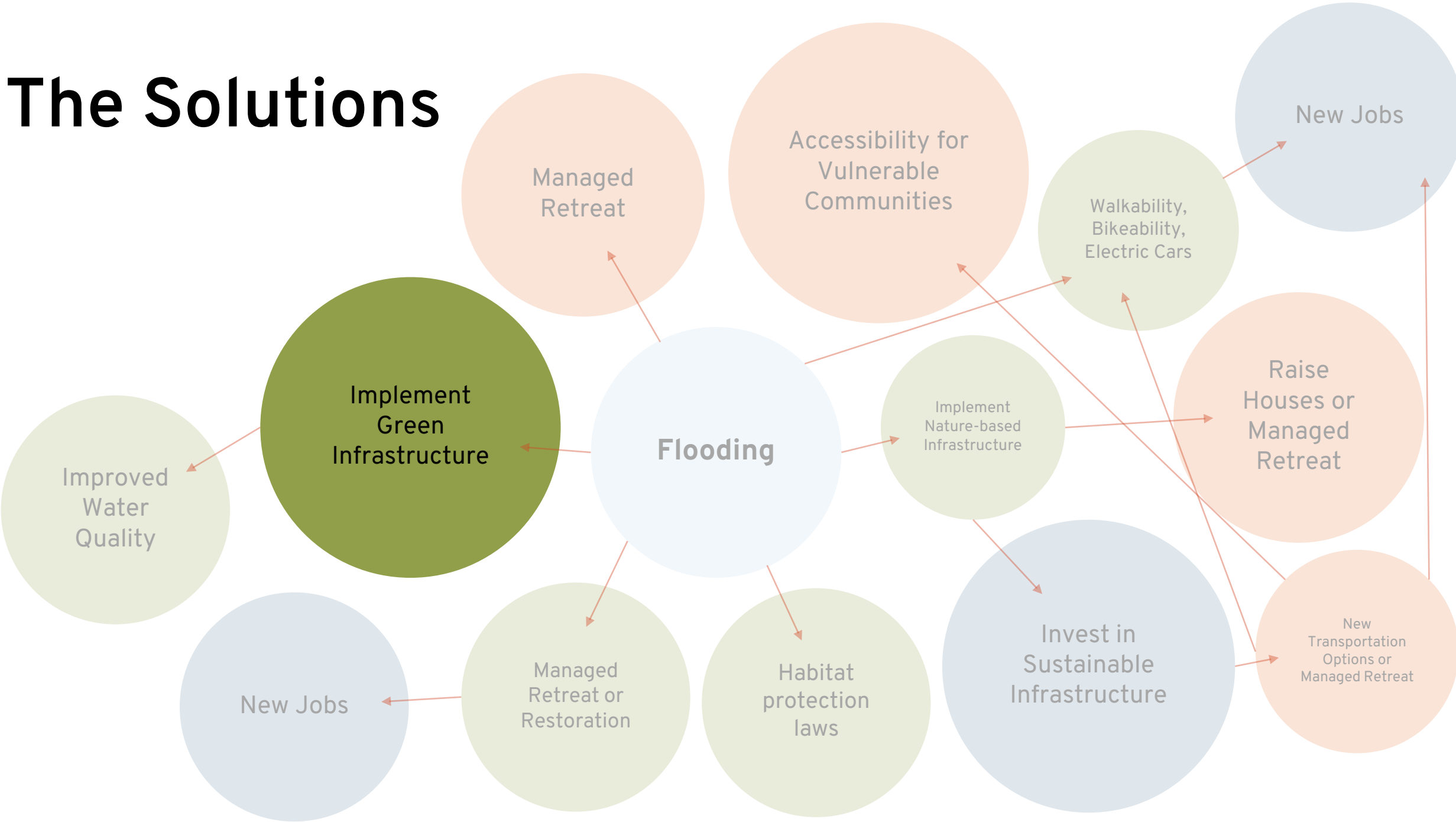
The Impacts



The Solutions



The Solutions





**Rainwater collected in planter box then
channeled into rain garden
Boulder, CO**



**Irrigation by disconnected downspout
Denver, CO**



**Green roof
Salt Lake City, UT**



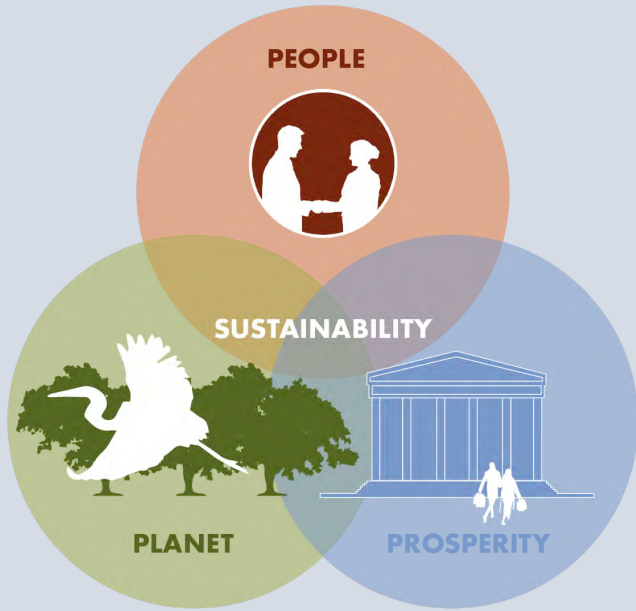
**Vegetative swale
Fort Carson, CO**



**Pervious pavement sidewalk
Sioux City, SD**

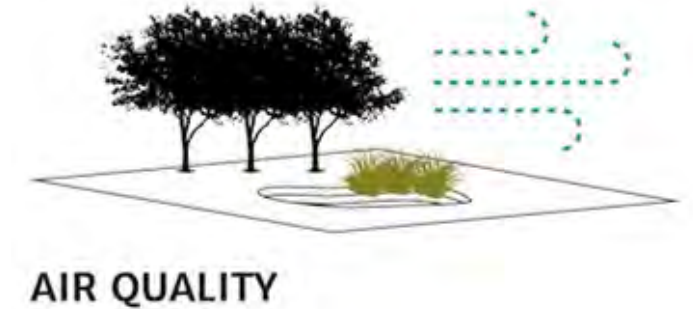
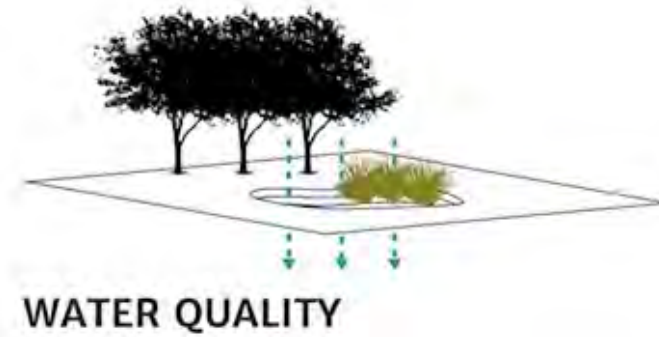


**Retention pond
Fargo, ND**



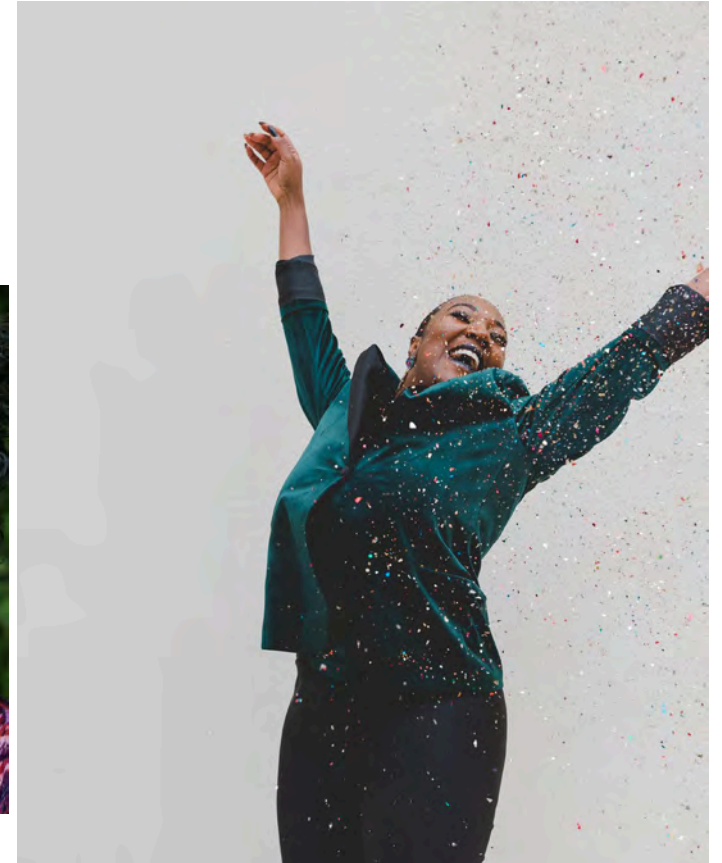
The Triple Bottom Line

Benefits of Green Infrastructure



Climate Co-Benefits

- Benefits that come from climate resilience strategies that go beyond tackling climate change alone
- Win-win's
 - (win-win-win-win's???)



Compact Development

Fewer cars on the road and reduced greenhouse gas emissions

Co-Benefits

- 👍 Healthier population
- 👍 Improved air quality
- 👍 Reduced fuel poverty



Local Agriculture

Decreased reliance on food imports and reduced greenhouse gas emissions

Co-Benefits

- 👍 Build local capacity
- 👍 Job opportunities
- 👍 Improved air quality





An aerial photograph of a coastal wetland. A winding river flows through a dense, green marshy area. To the left, a sandy beach separates the marsh from the ocean. The ocean is a deep blue, and the sky is a lighter blue. The text "Thank You" is overlaid in white, bold, sans-serif font.

Thank You

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