



**DENVER**  
THE MILE HIGH CITY

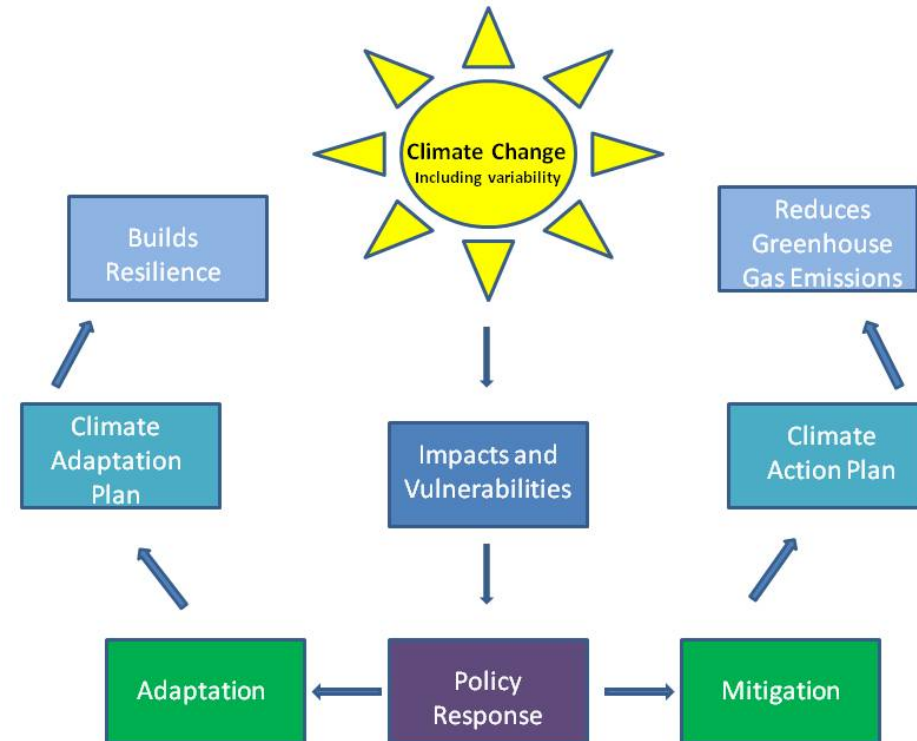
# Denver Parks and Climate Change

Dave Erickson & Tom Herrod

October 18, 2016

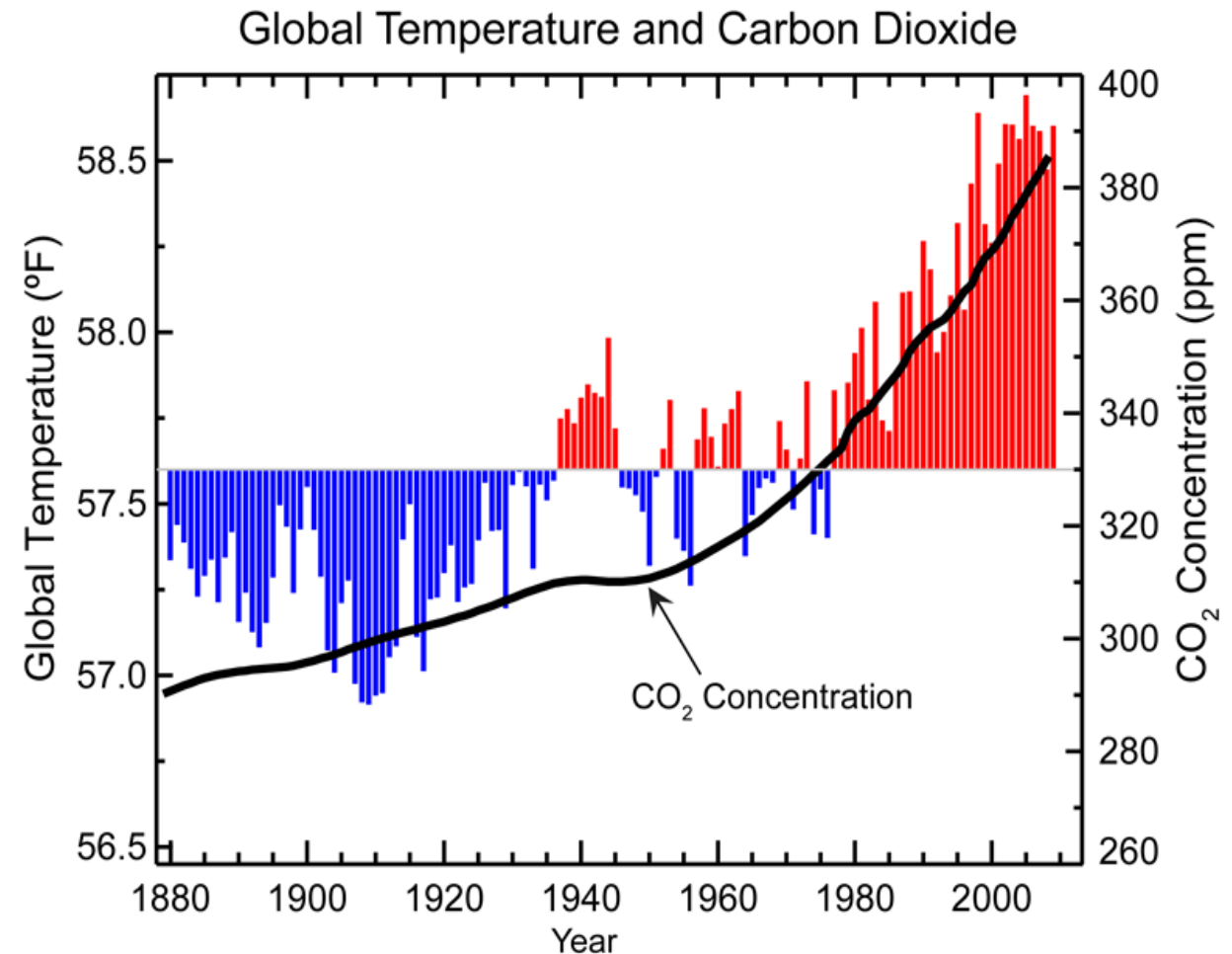
- 2014 Development of the Climate Adaptation Plan
- 2015 Climate Adaptation Plan Update
- 2015 Development of Climate Action Plan
- Climate and health vulnerability index
- Development of long-term heat impacts- 90+ degree days
- Challenges and lessons learned

- Mitigation refers to strategies and activities associated with decreasing emissions of green house gasses – carbon dioxide, methane, nitrous oxide, and ozone.
- Adaptation refers to strategies and activities implemented to reduce the vulnerability of social and biological systems to climate change effects



## Local Green House Gas Mitigation Important

- Denver is a leader in green house gas (GSG) mitigation
- Local efforts support state, national and global GHG reductions
- Mitigation and adaptation are important to protect what we cherish



3<sup>rd</sup> worst urban heat island effect after Las Vegas and Albuquerque<sup>1</sup>

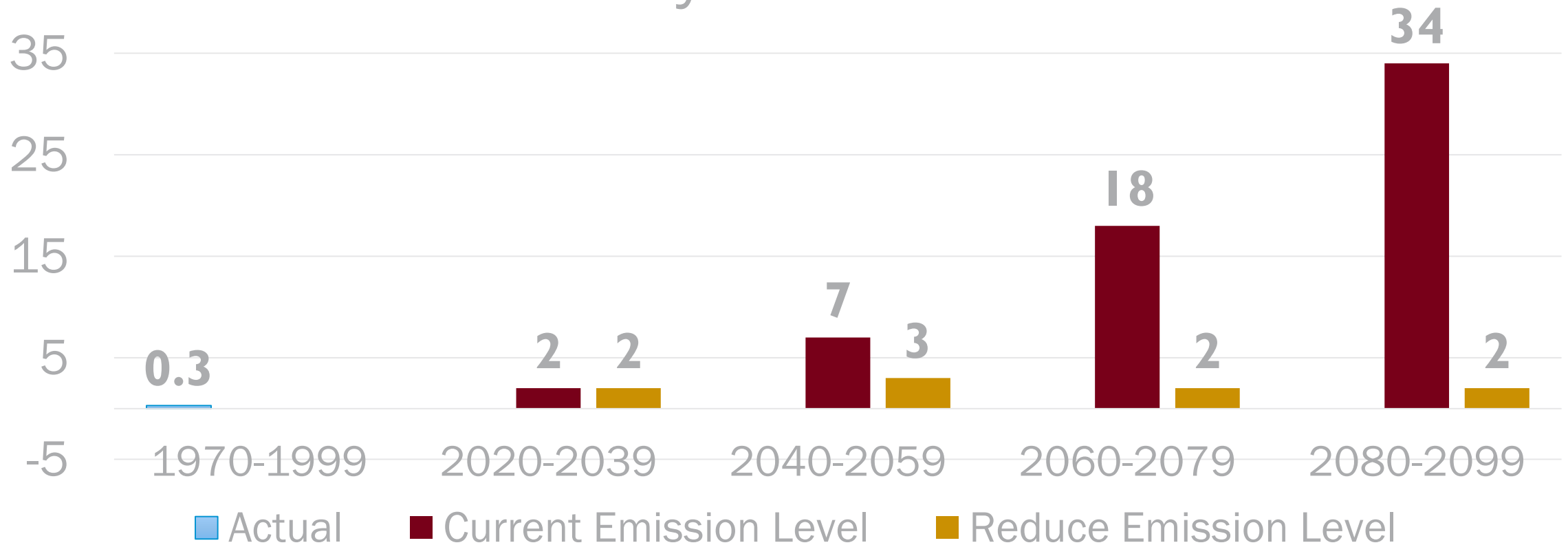
- Average daily temperature difference between urban and rural is 4.9° F
- Denver averaged 26 more days above 90° F than rural stations

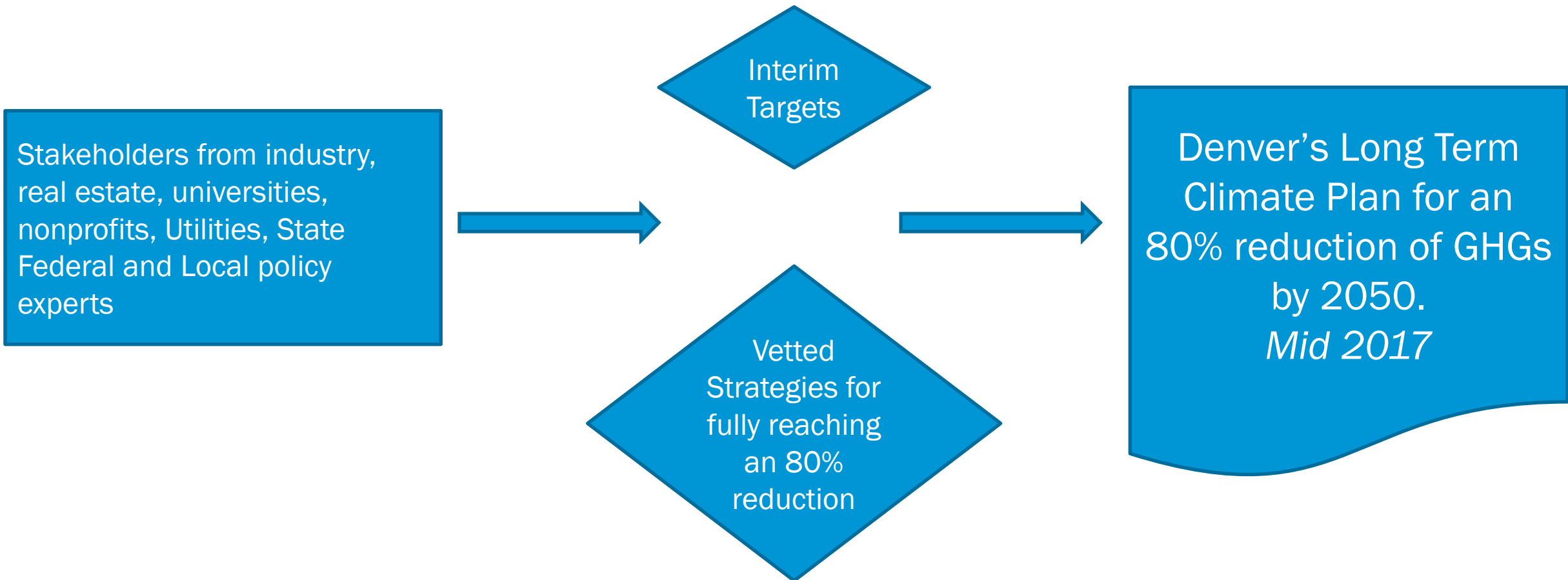


<sup>1</sup>Source: Climate Central, methodology controlled for elevation and climate of surrounding areas

# Why Mitigation and Adaptation

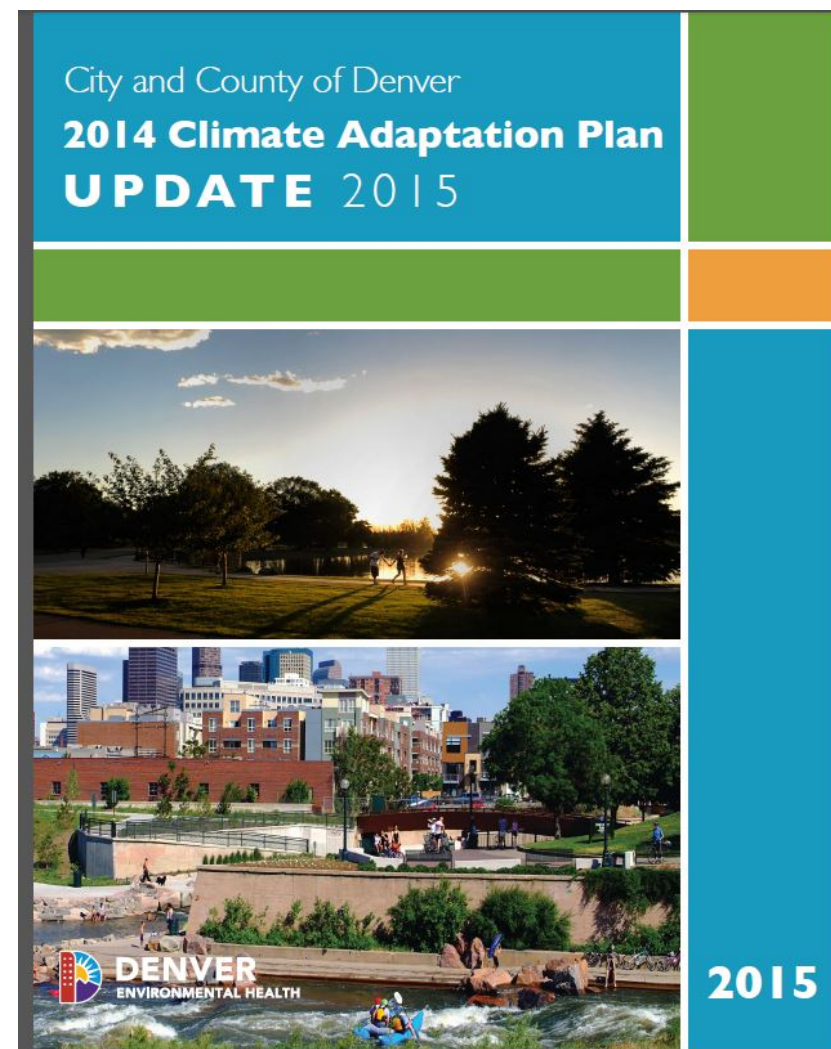
Days  $\geq 100^\circ$





## Denver's Vulnerabilities

- An increase in temperature and urban heat island effect
- An increase in frequency of extreme weather events
- Reduced snowpack and earlier snowmelt





## Park & Rec Activities

### Combating Urban Heat Island Effect

- Tree canopy
- Be a Smart Ash
- Urban Tree Mix

### Conserving Water

- Irrigation infrastructure upgrade
- Recycled water

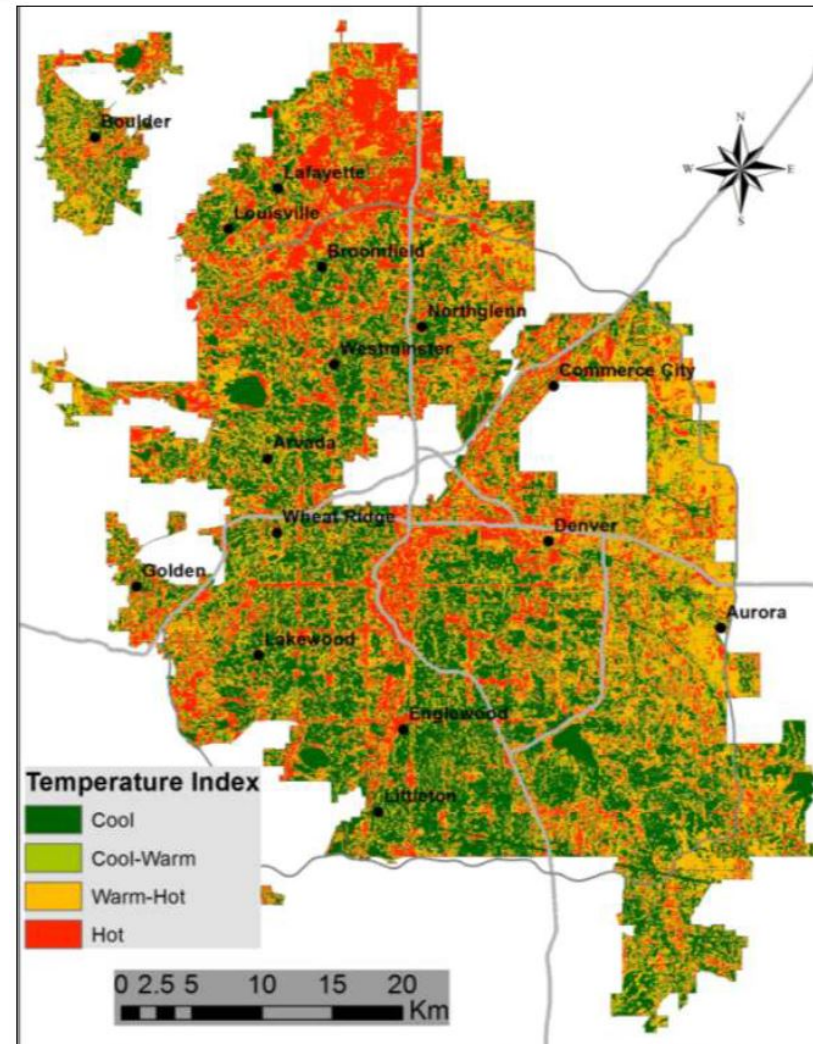
### Citywide Activities

- Green infrastructure



## Evaluation of Tree Canopy

- Shades 19.7 percent of Denver
- Saves greater than 56,000 mega watt hours of cooling per year equivalent to more than \$6.7 million in energy savings
- Stores 310 tons of CO<sub>2</sub> and sequesters an additional 14 tons of CO<sub>2</sub> each year
- Partially threatened by Emerald Ash Borer



## Protecting Tree Canopy

- May impact 330,000 ash trees in Denver making up 15 percent of urban tree population
- Denver has ten-year plan to proactively manage impacts of EAB
- Will begin preventive treatments to protect public ROW trees
- Denver's street tree inventory is available to show locations of Ash trees

## Emerald Ash Borer (EAB)



## Right-of-Way Tree List

- Recently updated
- Includes trees that are likely to survive in a future warmer and possibly drier climate
- Protect and enhance future tree canopy in Denver



## Water Conservation Measures

- Irrigation infrastructure upgrade
  - Central Control Master Plan
  - Automatically senses watering needs
  - Save 20 percent over older manual system
- Recycled water
  - Work with Denver Water
  - WaterReuse Customer of the Year Award
  - 314 million gallons water per year to 34 parks





# Prioritizing Green Infrastructure in Denver

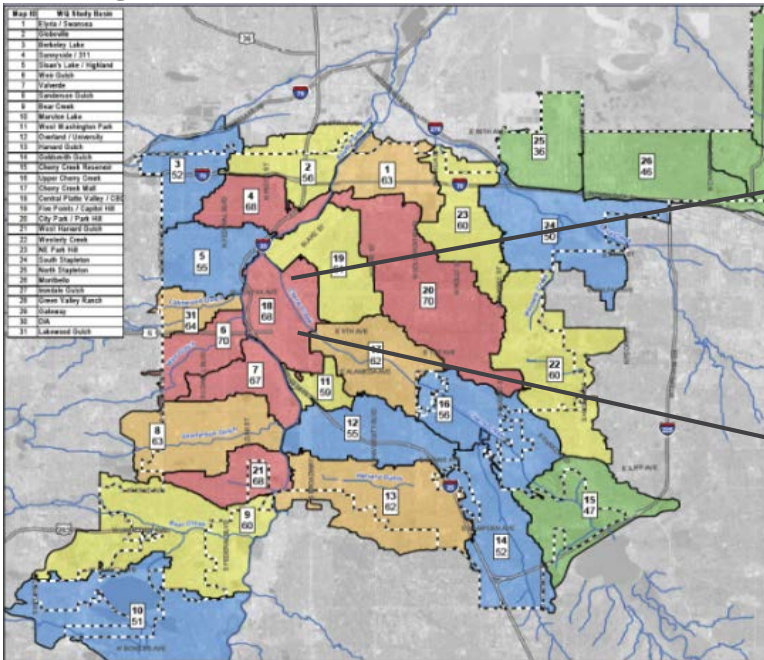
## Identifying Water Quality Priorities

Primary Category	
Existing TMDL	Is drainage basin directly to the SPR & existing TMDL (126 cfu/ml)
303(d) listed waterbody	Does drainage basin contain a water body listed on the 303(d) list (impaired waterway)
Wet weather pollutant loading Dry weather pollutant loading	Average annual pollutant load per land use for wet weather Average annual dry weather pollutant load per area
Disconnected Impervious Area	Density of storm drain network (higher indicates greater need for WQ)
Redevelopment Potential	Per Blueprint (new development over 1 acre requires WQ)
Impervious Area within the ROW	Amount of ROW divided by total basin area (streets largest contributor of pollutants)
Existing Treatment	Amount of treatment expected by existing WQ facilities

Secondary Category	
Park Density	Ratio of park per 10,000 persons
Economics	% of persons in low to moderate income level (HUD defined)
Green-ness	Ratio of total tree canopy coverage divided by basin area
Heat Island Effect	Measure of heat energy absorbed by urban materials
Transportation Pollutant Index	Total vehicle miles traveled

## Scorecard Method

1. Prioritize basins with greatest WQ needs
2. Implement projects by using 'Scorecard' to identify regional and site-scale green infrastructure to address wet and dry weather discharges



### 6 High Priority Basins

- Central Platte Valley
- City Park/Park Hill
- Weir Gulch
- Valverde
- Sunnyside/311
- West Harvard Gulch



Regional and sub-regional opportunities on city property



Green street and alley opportunities in ROW



Tom Herrod 720-865-5388  
Dave Erickson 720-865-5433