CITY OF TUCSON

UHI Mitigation: The Tucson Story

EPA Webinar: Keeping Your Cool:

How Communities Across the Nation are Reducing the Urban Heat Island Effect

June 26, 2014

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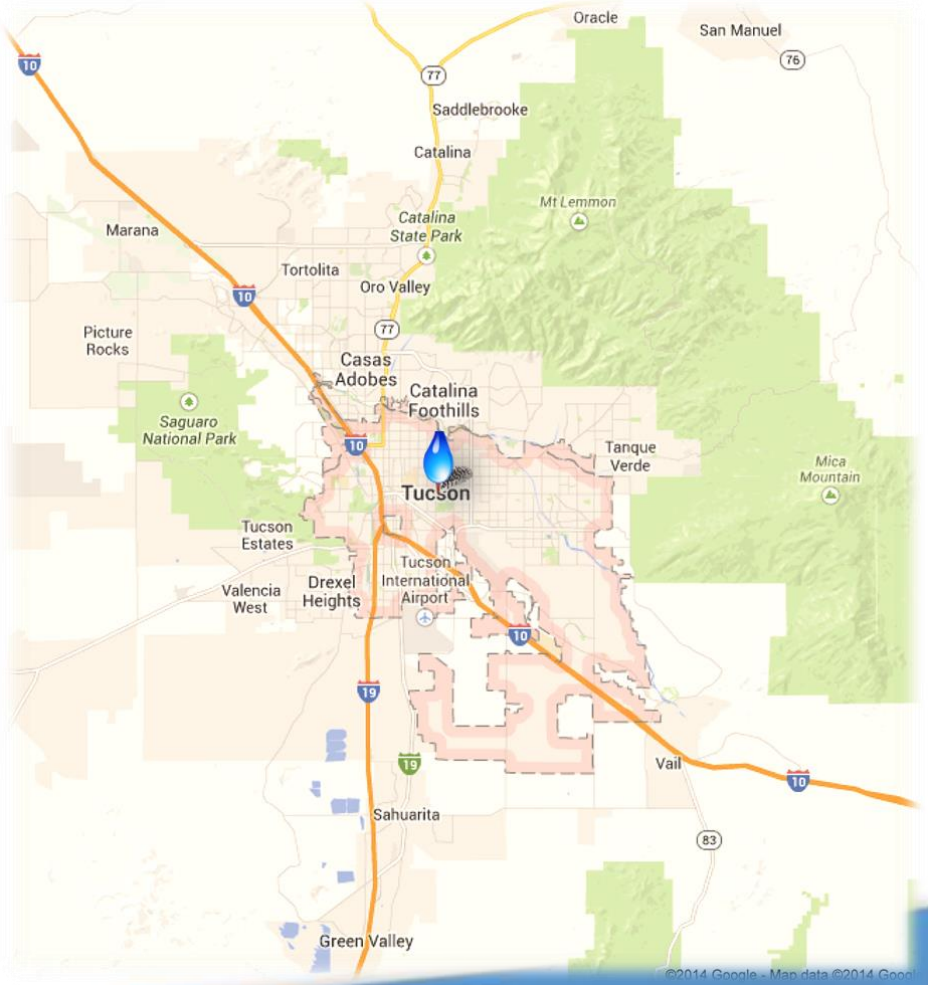
Office of Integrated Planning
City of Tucson

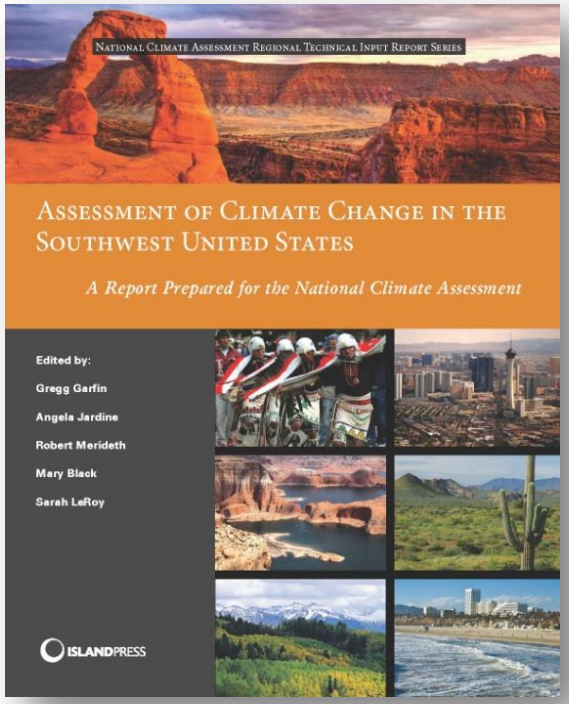
The Story

- What the future could look like
- Identifying issues of today
- Trees can make a difference



It's Hot

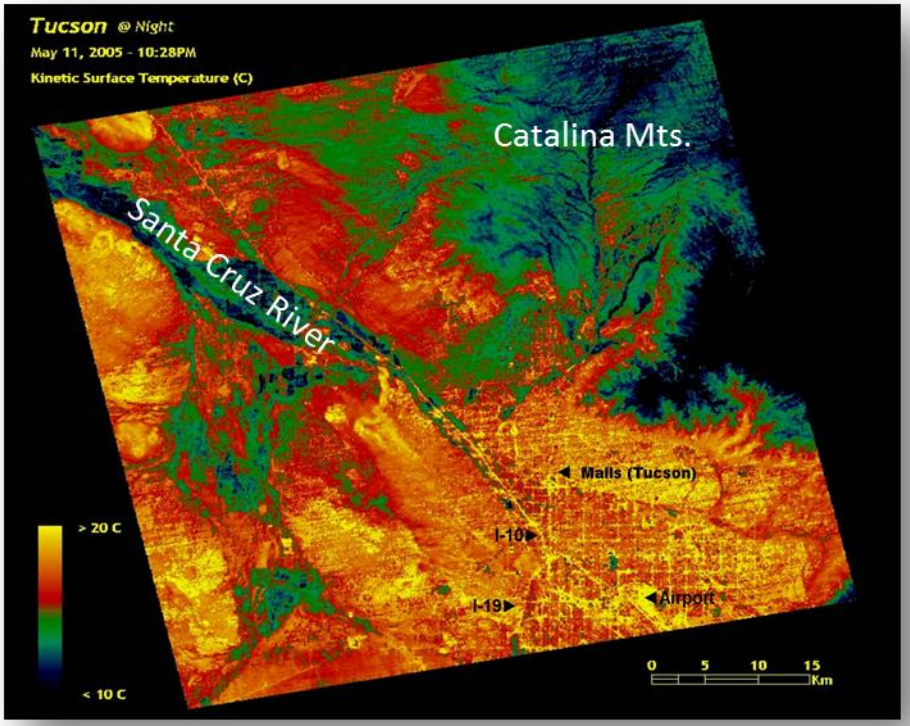
Climate Change & UHI



2013 Institute of Environment

Chapter 15. Human Health

Coordinating Lead Authors: Heidi Brown (Univ. of AZ); Andrew C. Comrie (Univ. of AZ); Deborah M Dreschsler (CA Air Resources Board)



Kinetic Surface Temperature
Tucson Basin, 2005

Dr. Jay Golden, ASU, SMART Center, National Center of Excellence

"**Heat stress**, a recurrent health **problem for urban residents**, has been the leading weather-related cause of death in the United States since 1986. . . – and the **highest rates nationally are found in Arizona.**

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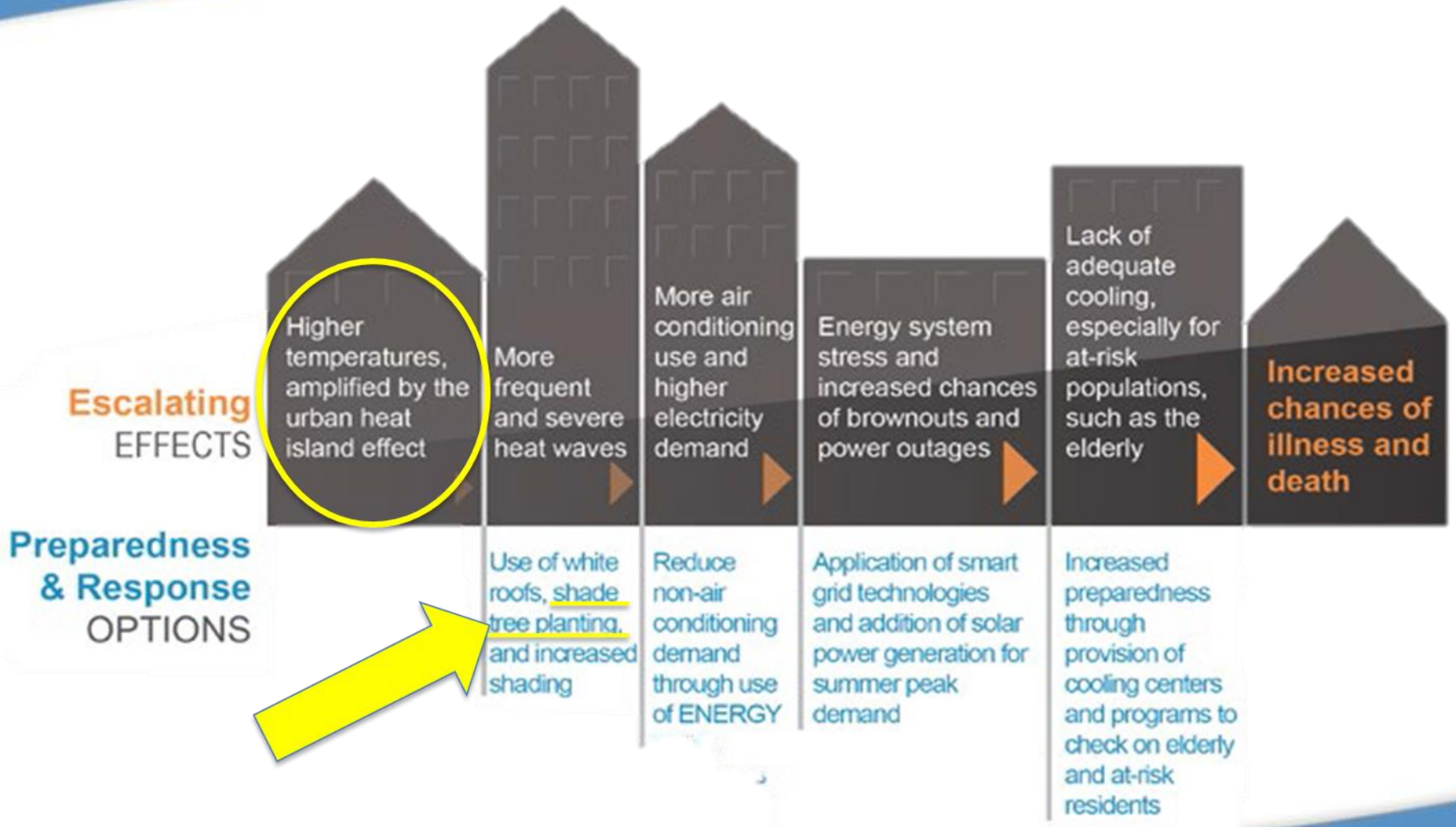
It's Hot

Multiple Effects of Climate Change



Garfin, G., G.Franco, H. Blanco, A.Comrie, P.Gonzalez, T.Piechota, R.Smyth, and R.Waskom, 2014: Ch. 20: Southwest. *Climate Change Impacts in the United States*: *The Third National Climate Assessment*, J.M.Melillo, Terese (T.C.) Richmond, and G.W.Yohe, Eds, U.S. Global Change Research Programs .

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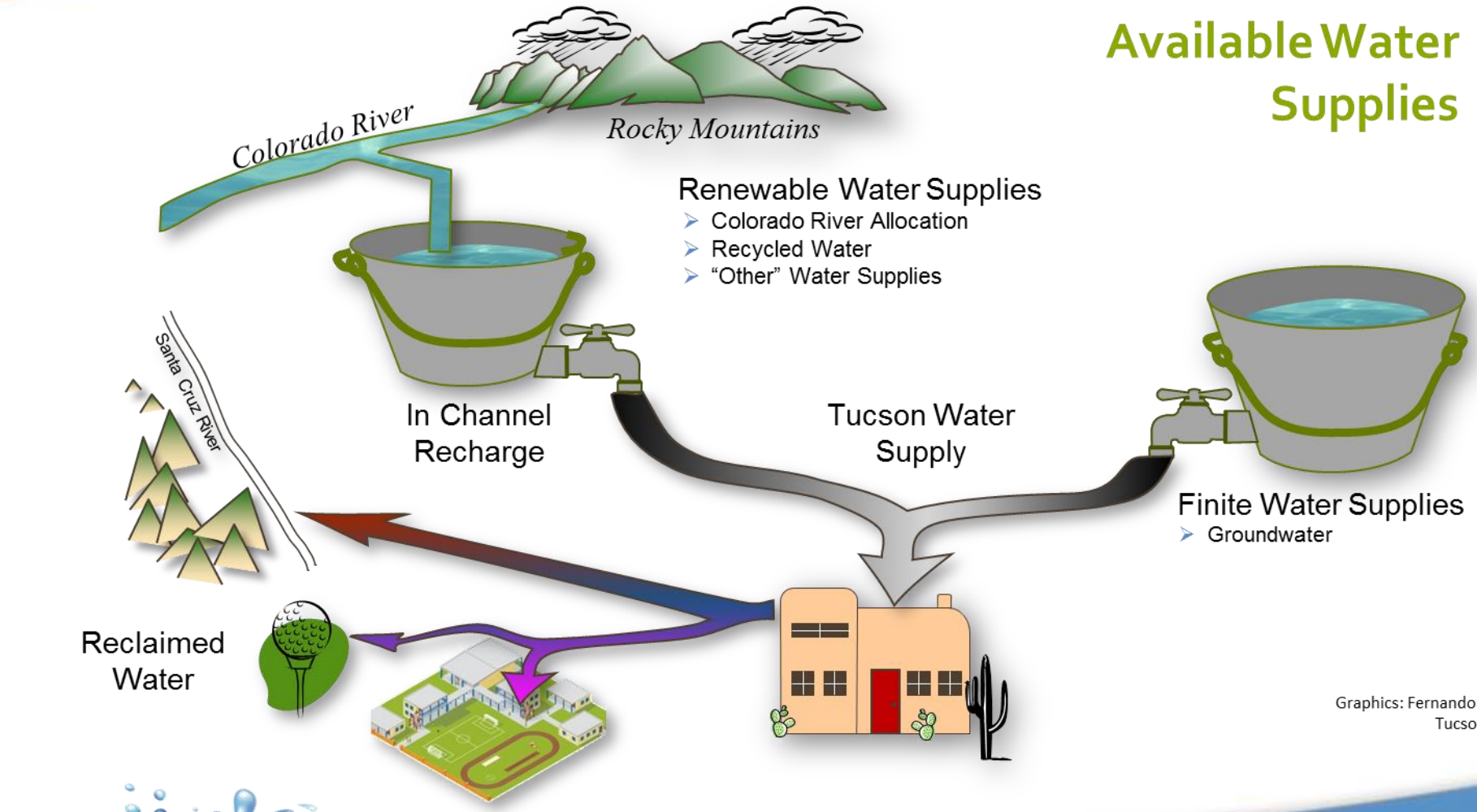
Issues in the Southwest

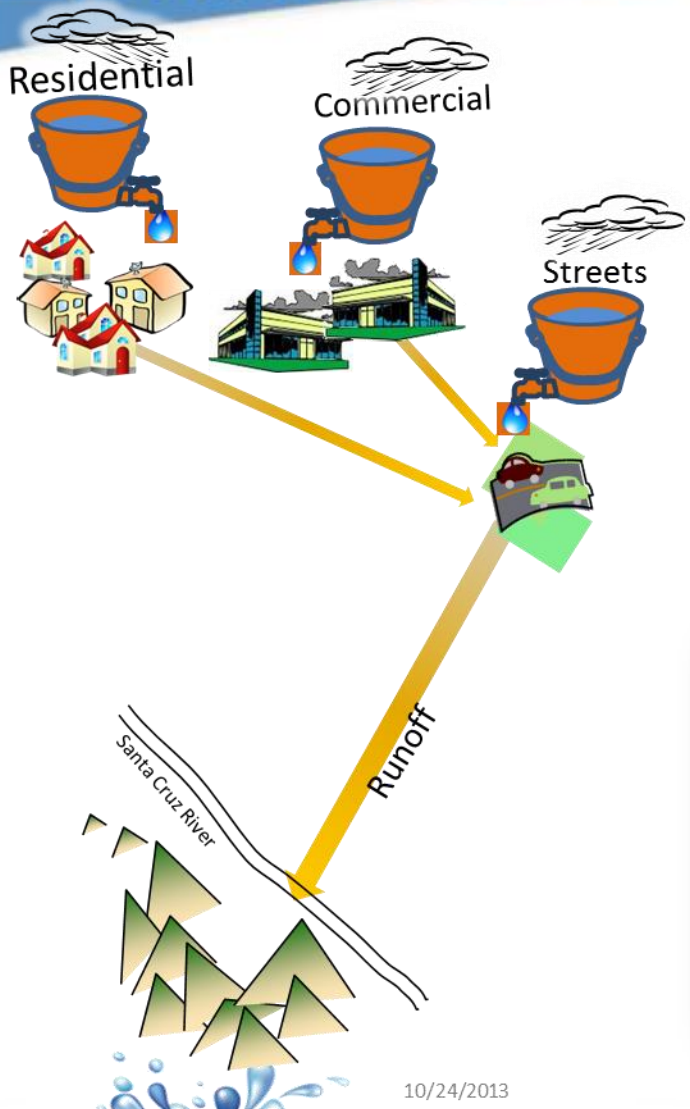
Water Resource



Graphics: Fernando Molina, Tucson Water

Issues in the Southwest

Water Resource



Commercial Parking Lot

Residential Cistern

Green Street Infrastructure

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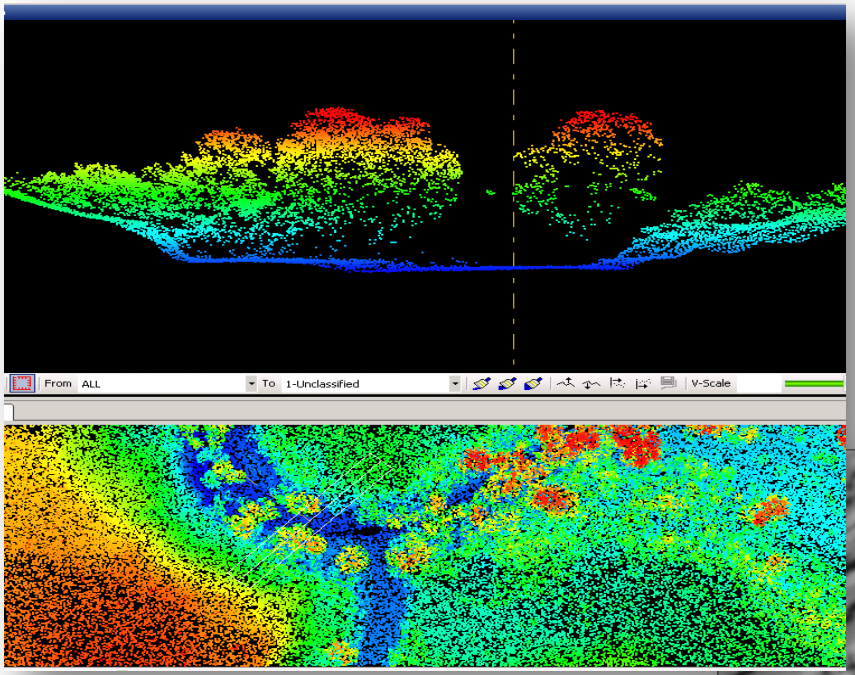
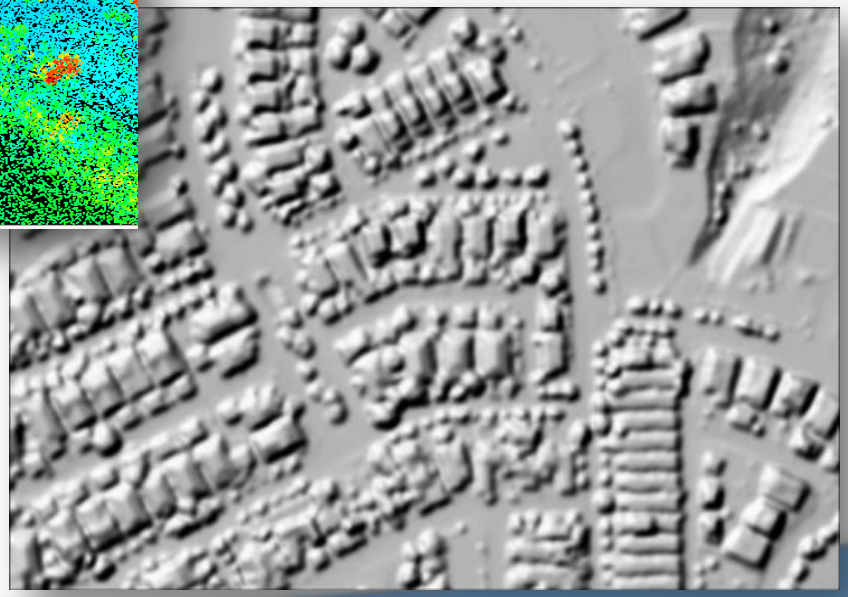
Issues in the Southwest

Water Resource



Mapping and measuring urban tree canopy using LiDAR mapping



Data Source: Josh Pope, GIS Manager, PAG: LiDAR tree canopy PC/ RFCD: Tyson Swetnam and Brian Powell– Cienega Habitat

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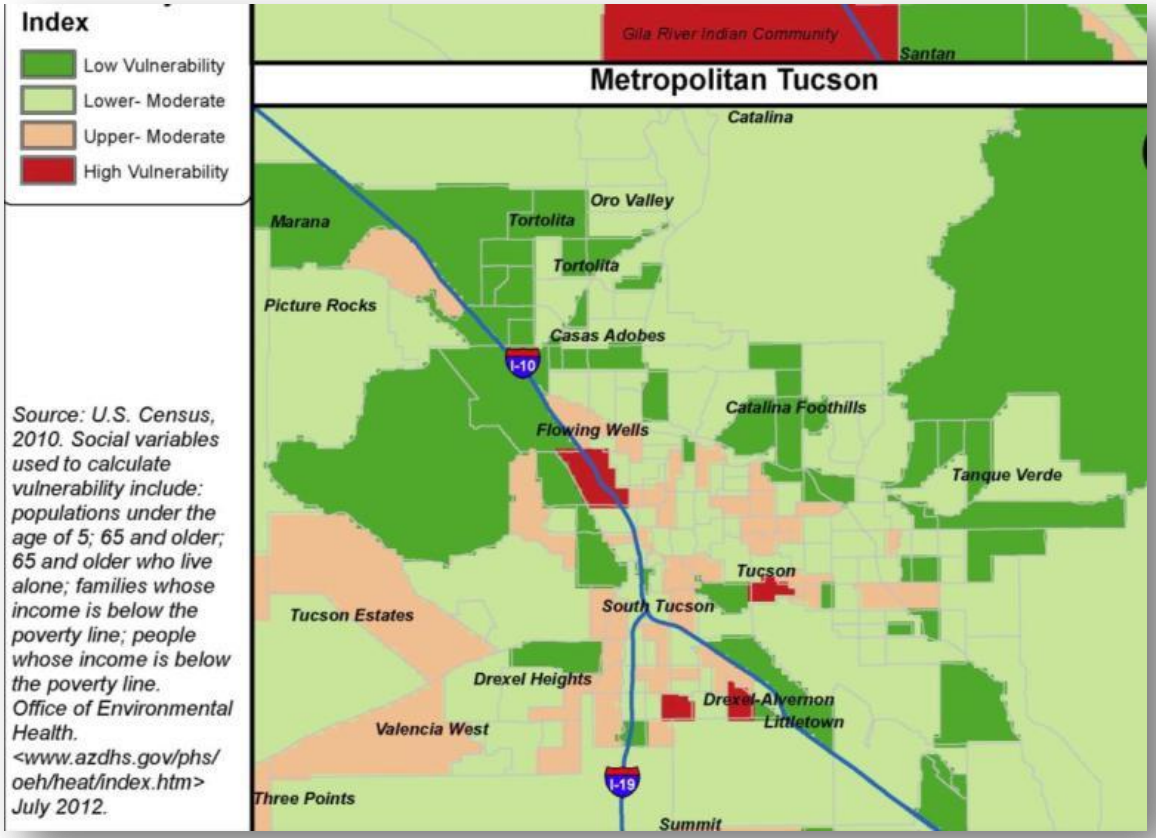
Issues in the Southwest

Water Resource



Arizona Health Services

- Heat Vulnerability Index
  - Based on US Census 2010
  - Map by census block

Dr. Sharon Harlan: Urban Heat Islands & Vulnerable Populations
http://climate.asu.edu/projections/sharon-harlan-urban-heat-island/

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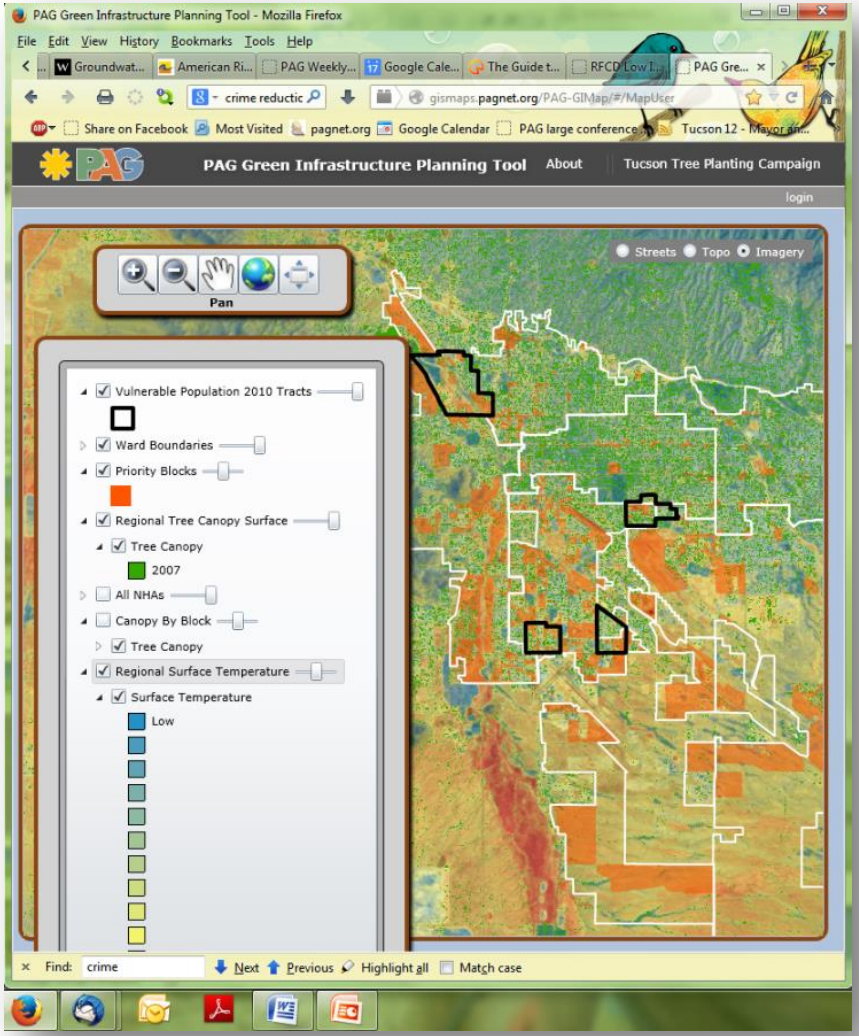
Data for UHI Toolbox

Vulnerable Populations



On-line Interactive Map

- http://gismaps.pagnet.org/PAG-GIMap/#/About
  - Vulnerability Index
  - Urban Forest Canopy
  - Neighborhood

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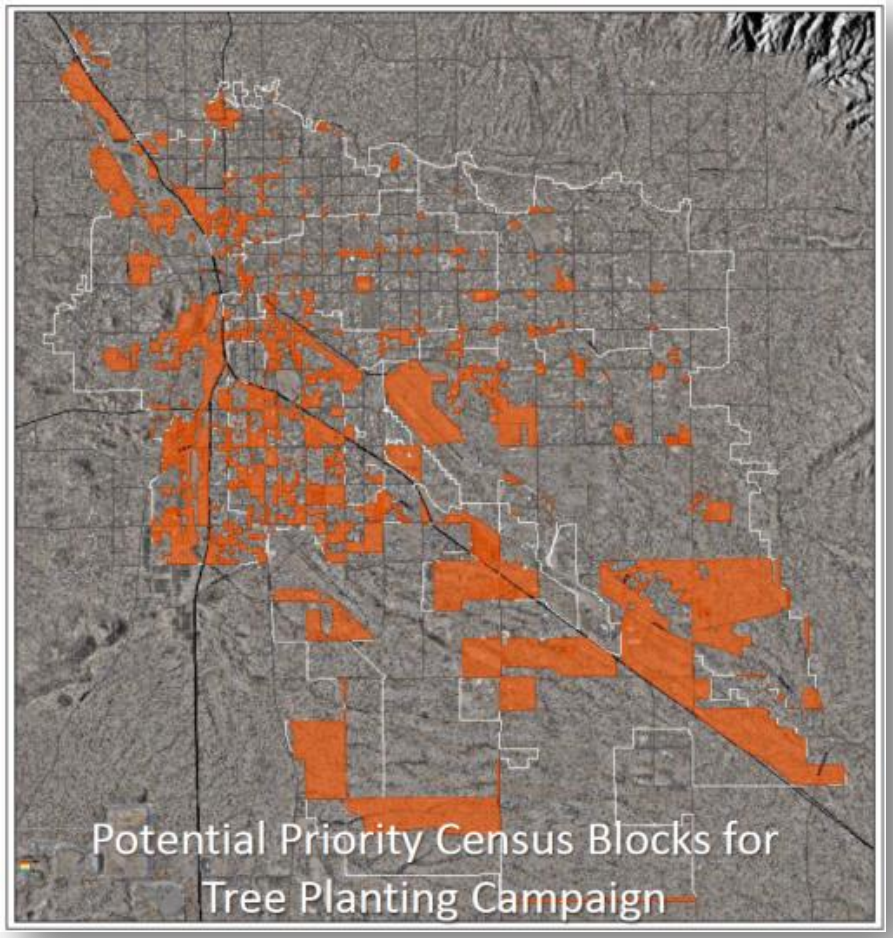
Planting Project

Mitigation: Planting Shade Trees



Mayor Rothschild's 10,000 Trees Campaign

- Goal to target vulnerable populations
- Plant Shade Trees to mitigate UHI
- Collaborate with
  - Businesses
  - Neighborhoods
  - Schools
  - Non-profits

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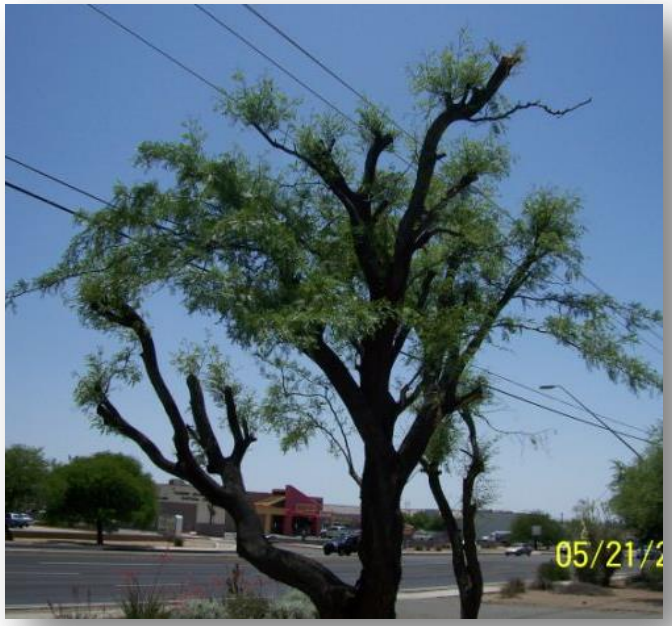
Planting Project

Mitigation: Planting Shade Trees

Volunteer Tree Planting



Directionally pruned – multiple times

TRICO ELECTRIC COOPERATIVE

TREES FOR TUCSON

TEP Tucson Electric Power

CITY OF FOUNDED 1775 TUCSON

TDOT

MAYOR'S 10,000 Trees CAMPAIGN

OFFICE OF INTEGRATED PLANNING

CITY OF TUCSON

Planting Project

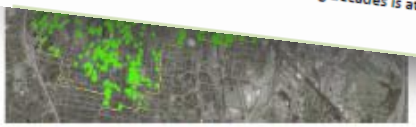
Mitigation: Planting Shade Trees

EPA United States Environmental Protection Agency

Improving Community Resiliency with Green Infrastructure

What is green infrastructure?

Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. The scale of green infrastructure ranges from urban installations such as rain gardens and green roofs up to large tracts of undeveloped natural lands. The interconnected network of green infrastructure can enhance the resiliency of infrastructure and communities by increasing water supplies, reducing flooding, providing climate adaptability, and improving water quality. Approximately one-third of the estimated growth in the 100-year floodplain over the coming decades is attributed to stormwater impacts of upstream development.



Green infrastructure opportunities in downtown Nashville
Photo credit: Nashville Green Infrastructure Master Plan

Enhancing resiliency to flooding and drought in Pima County, AZ

Pima County, home to Tucson, is encouraging the use of green infrastructure to mitigate flooding, improve water quality, and augment the supply of available water.

The City of Tucson has partnered with NGOs to install green infrastructure on residential collector streets, and has adopted an internal policy requiring all public streets to integrate green street concepts into the initial designs.

The green streets infiltrate rainwater to augment local water supplies while simultaneously reducing water pollution. They also help achieve Tucson's water conservation goals, which require rainwater to be used to help reduce potable water demand.

Parking lot designed to infiltrate runoff in Tuscon, AZ
Photo credit: Watershed Management Group

For more info see EPA's Green Infrastructure website: http://water.epa.gov/infrastructure/greeninfrastructure/ Publication # 830F14001

10,000 Trees: Over 9600 Trees planted

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- **Trees for Tucson**
  - Katie Gannon
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  - Peg Weber
  - Fernando Molina
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  - Evan Canfield
- **Pima Association of Governments**
  - Mead Meir
  - Josh Pope

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Questions / Resources

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Univ. of Arizona Water Resource Research Center newsletter article:
https://wrrc.arizona.edu/LID-green-infrastructure

Rainwater Harvesting Ordinance:
http//www.tucsonaz.gov/ocsd/sustainability/wter/rainwaterharvesting.php

Tucson Department of Transportation Green Street Active Practice Guideline:
http://cms3.tucsonaz.gov/files/transportation/Green_Streets_APG_Signed_by_Director.pdf

City-County Water Study White Paper on Stormwater:
http://www.tucsonpimawaterstudy.com/Reports/Phase2/Stormwater.Mgt.Tech.Paper.pdf