

# Cienega Creek and Shallow Groundwater Updates

Presented to the Local Drought Impact Group  
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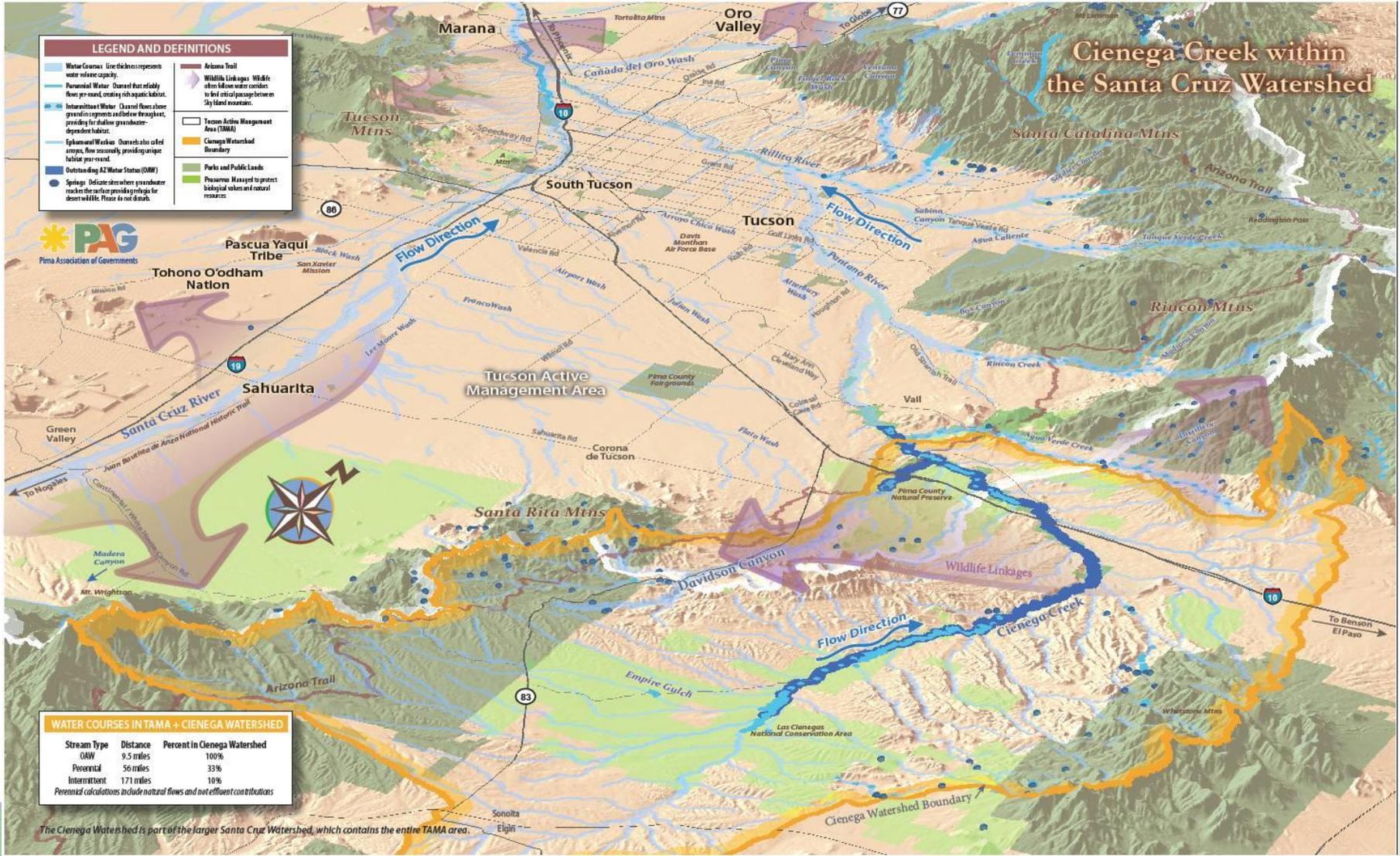
# Background

- Representing urban periphery and natural systems
  - Local conditions
  - For LDIG and ADWR
  - Annual Reports
- Initiated to detect impacts of land use change
  - Sonoran Desert Conservation Plan
- Importance of Cienega
  - Few lowland perennial streams
  - Outstanding Arizona Water



# OUTLINE

1. Cienega Drought Update
2. Shallow Groundwater Strategies



# Cienega Creek Quarterly Flow Extents 2014-15 Monitoring Year

**September 2014**

3.81 miles

**December 2014**

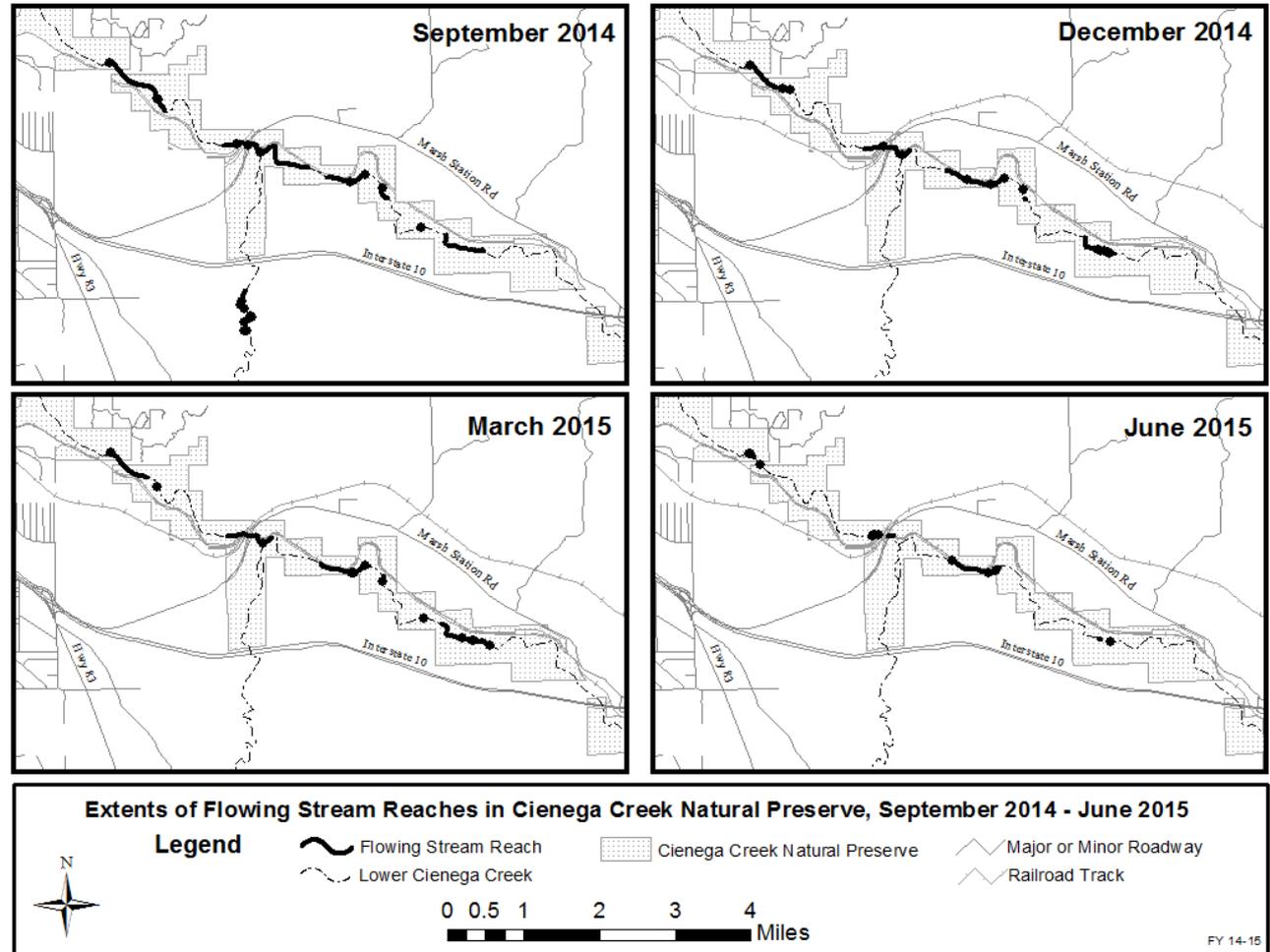
2.65 miles

**March 2015**

2.92 miles

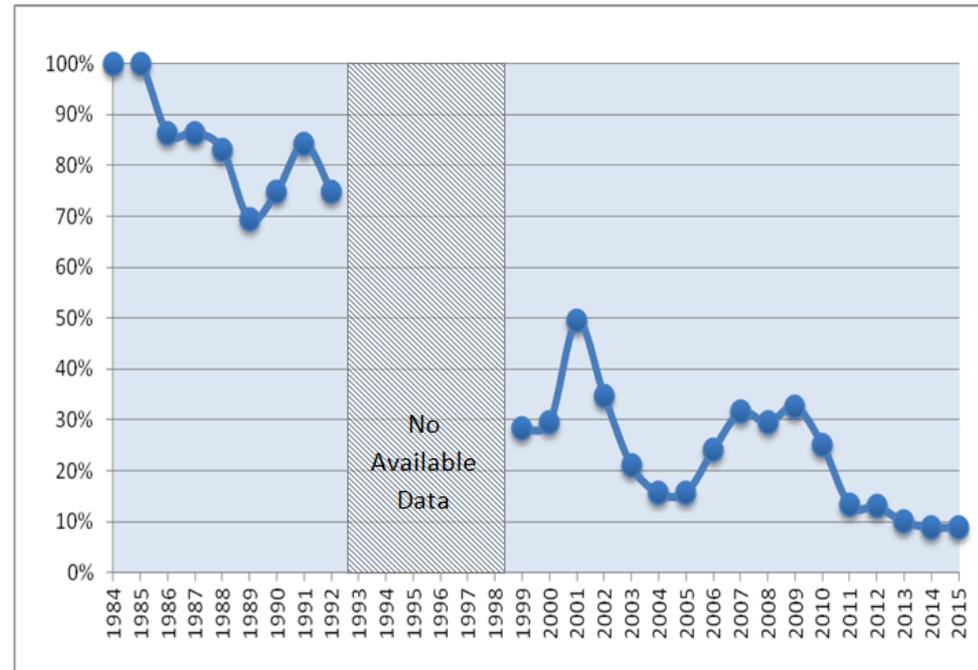
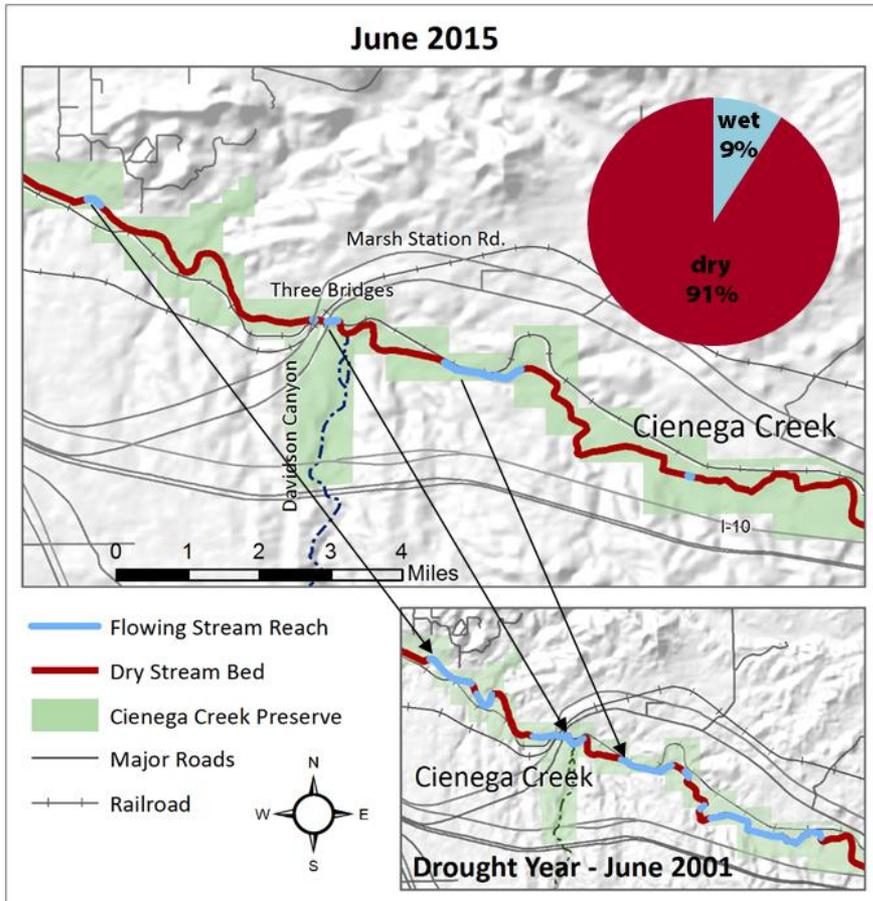
**June 2015**

0.88 miles



# June 2015 Flow Results

- 0.88 miles perennial flow
- Only 106 feet longer than the June 2014 record low



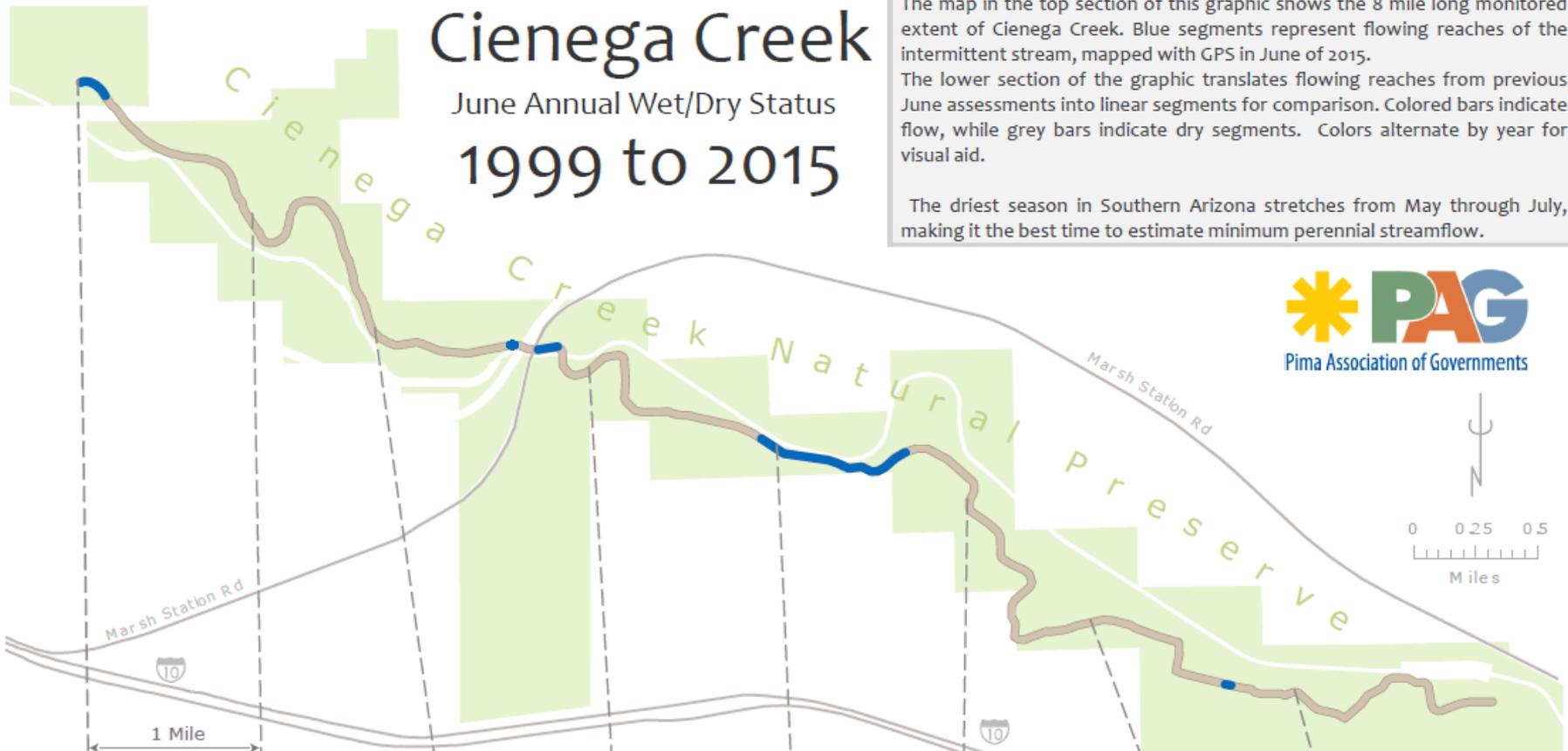
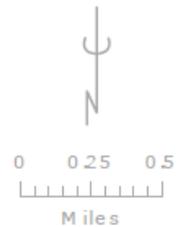
# Cienega Creek

## June Annual Wet/Dry Status 1999 to 2015

The map in the top section of this graphic shows the 8 mile long monitored extent of Cienega Creek. Blue segments represent flowing reaches of the intermittent stream, mapped with GPS in June of 2015.

The lower section of the graphic translates flowing reaches from previous June assessments into linear segments for comparison. Colored bars indicate flow, while grey bars indicate dry segments. Colors alternate by year for visual aid.

The driest season in Southern Arizona stretches from May through July, making it the best time to estimate minimum perennial streamflow.



# Zooming Out...

- Lake Powell and Lake Mead have dropped during the same time period -> **Local Impacts**





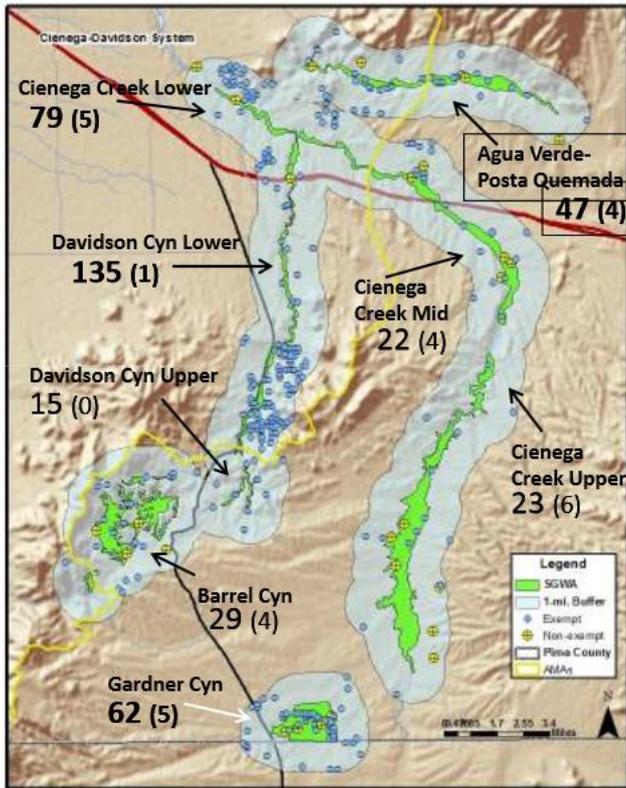
# Local Wells

## Cienega

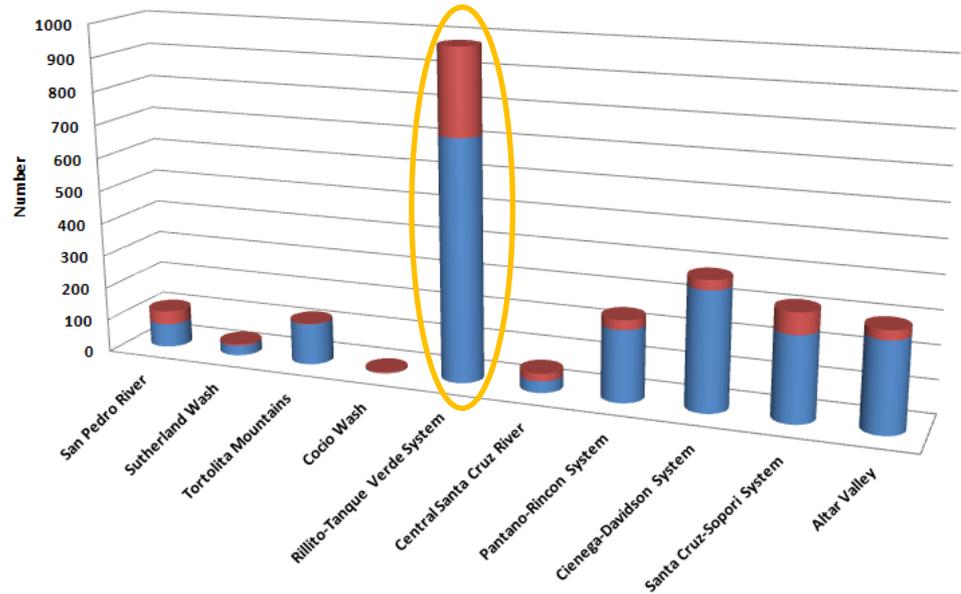
Steady increase in wells

Declines in water table near Vail

## Sabino/Tanque Verde



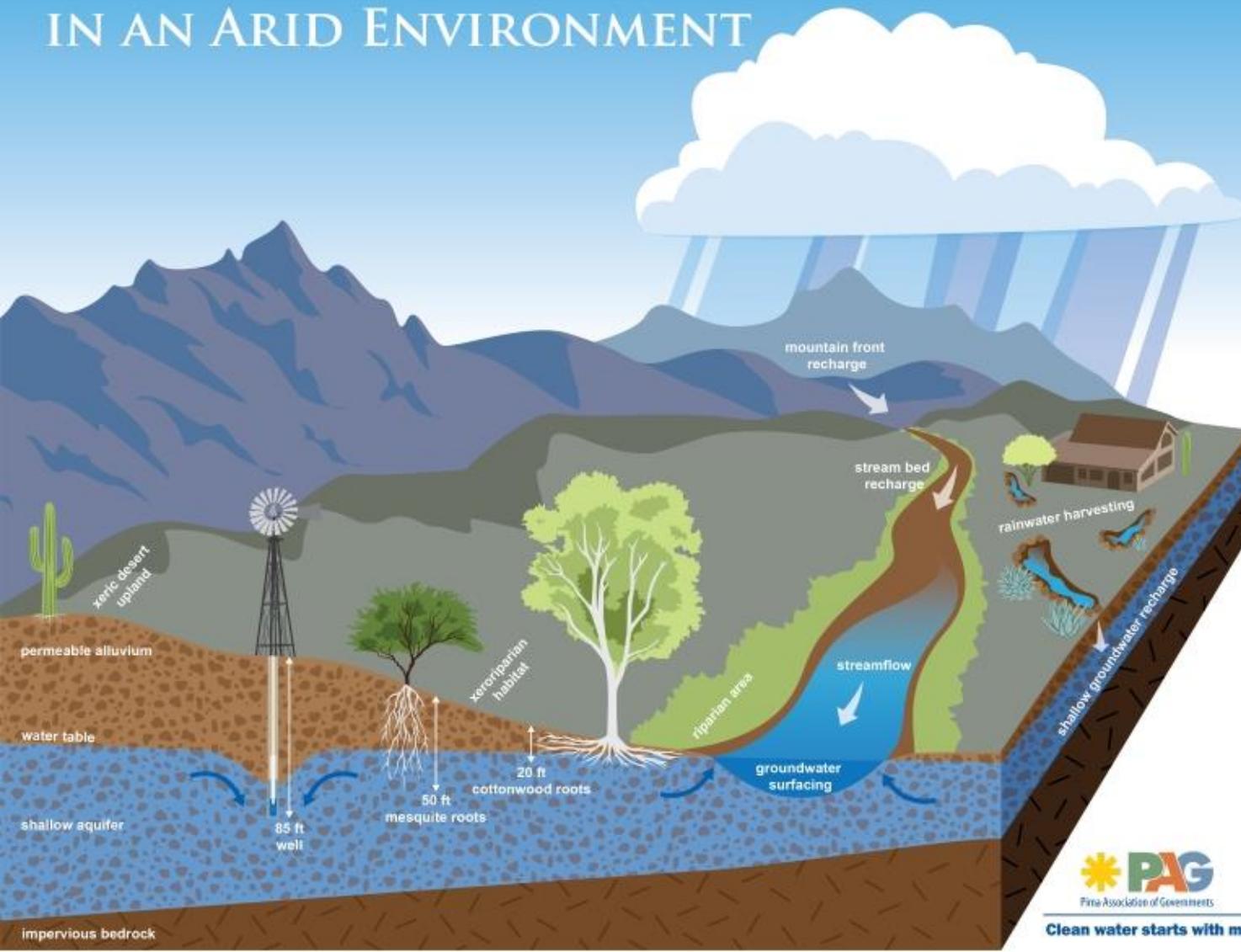
Numbers of Exempt and Non-exempt Wells by Region (2012)



Region	San Pedro River	Sutherland Wash	Tortolita Mountains	Cocio Wash	Rillito-Tanque Verde System	Central Santa Cruz River	Pantano-Rincon System	Cienega-Davidson System	Santa Cruz-Sopori System	Altar Valley
# Non-exempt Wells	41	5	2	4	257	23	29	29	64	28
# Exempt Wells	72	30	125	1	722	35	215	355	255	268

# Shallow Groundwater Outreach & Restoration

## SHALLOW GROUNDWATER RESILIENCE IN AN ARID ENVIRONMENT



**Low Impact Development (LID) protects shallow groundwater-dependent ecosystems and enhances private well security**

### *Sustaining a unique desert ecosystem.*

In contrast to deeper aquifers with lower water tables, in this system shallow bedrock brings groundwater close to the surface, creating a shallow aquifer. Shallow groundwater sustains lush, rare riparian habitat and perennial creeks in the desert. Local well owners also rely on the groundwater, just as the verdant habitat does that enriches their landscape.

### **Why is this important?**

Local drought conditions are impacting the survival of aquatic species and causing well owners to truck in water or drill deeper. Pima Association of Governments' studies find record level drought, and data inventories show that the number of wells and amount of water pumped from shallow groundwater areas is increasing every decade.

### **Make a difference by harvesting rainwater!**

With LID practices, such as collecting rain in containers or contouring the land to capture runoff for beneficial use, property owners' need to irrigate with pumped groundwater, will be reduced. Stormwater harvesting earthworks in the landscape also help to slow runoff and increase its infiltration to replenish the shallow groundwater. Earthworks restore erosion features, which would otherwise continue to cut into the alluvium thereby dewatering shallow aquifers, deepening arroyos and reducing floodplain wetting.

Some residents choose to install large rainwater harvesting cisterns instead of drilling deeper wells or hauling in imported water. They find the price of a cistern and treatment system to be similar to that of a new well and that it still supplies enough water for the household.



Clean water starts with me!

# PAG Heritage Waters/ Shallow Groundwater Resolution

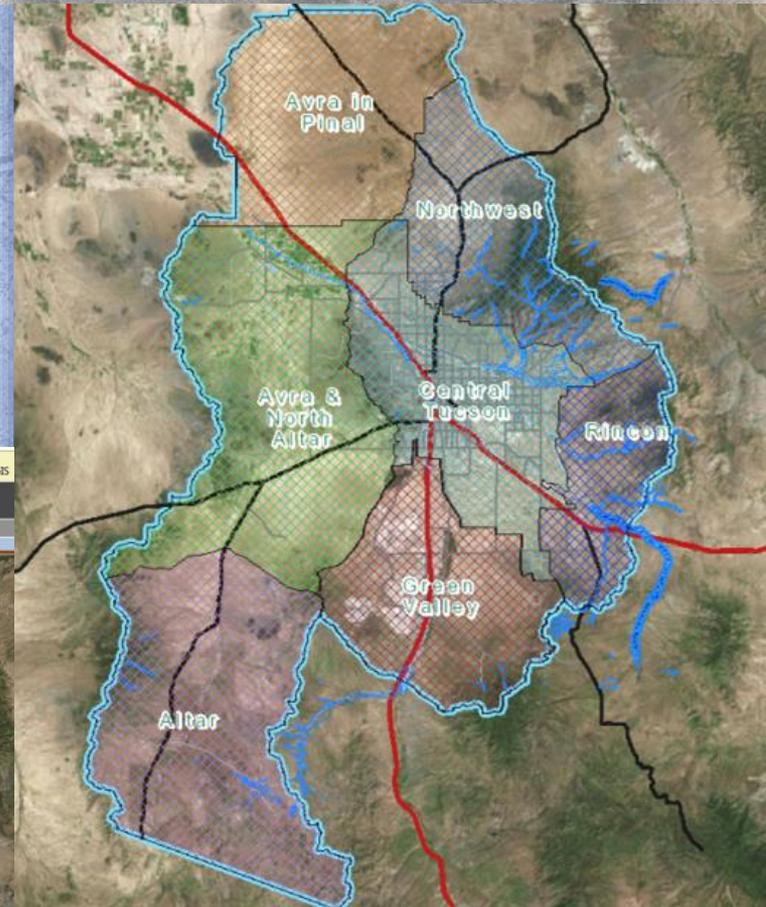
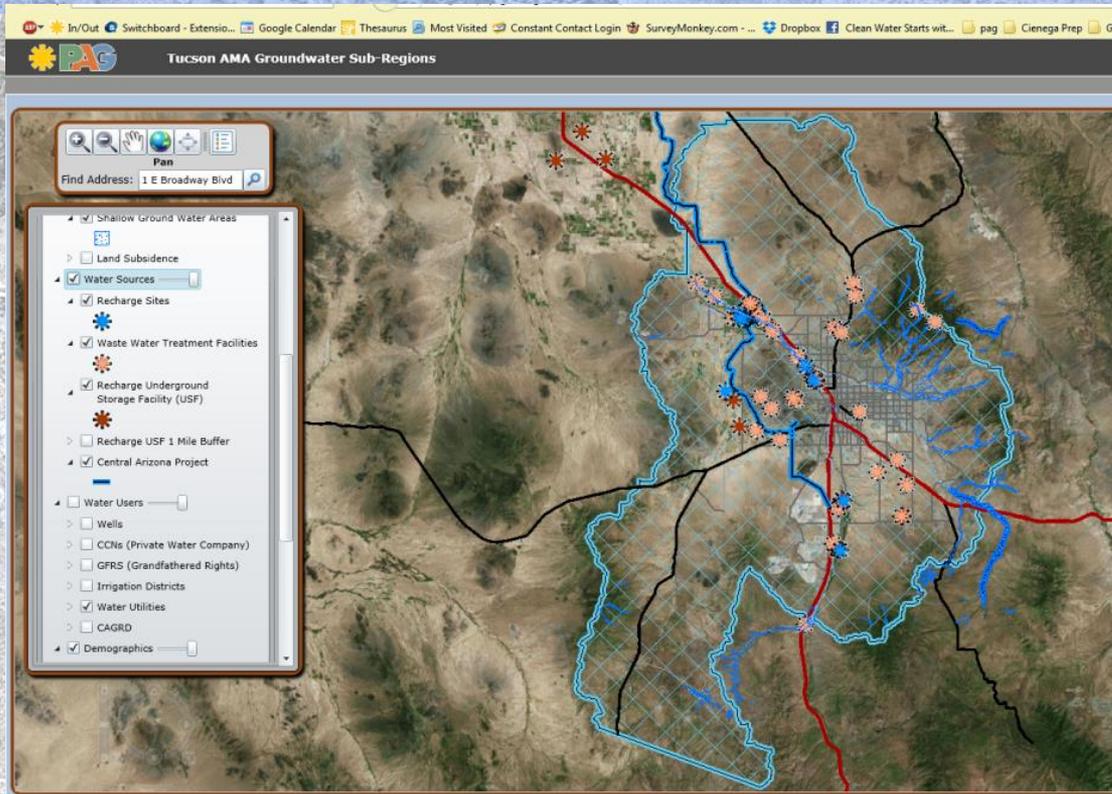
## Resolution

- Task Force
- Benchmark for value
- Commend model support efforts
- Set goals
- Outcomes: Funding, Collaboration, Important Benchmark



# Policy & Research

- Water Accounting Areas
- Basin Study
- Pima county Planning and Zoning
- Cienega groundwater-geology-surface water working group (isotopes)



Thank you!  
Questions?

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