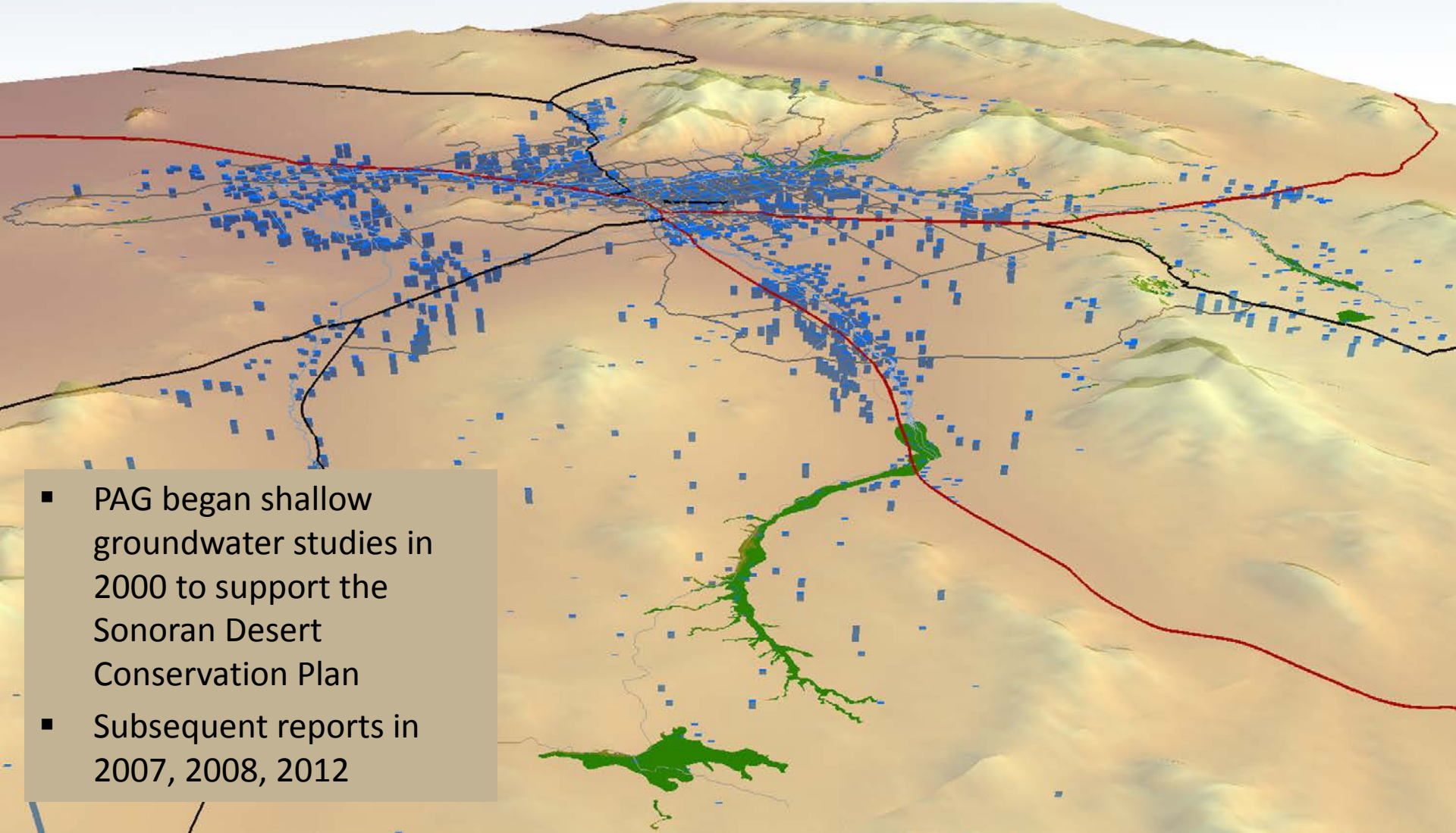
Pima Association of Governments

Sustainable Environment

Shallow Groundwater Areas in Eastern Pima County, Arizona

Water Well Inventory and Pumping Trend Analysis, 2012



- PAG began shallow groundwater studies in 2000 to support the Sonoran Desert Conservation Plan
- Subsequent reports in 2007, 2008, 2012

Shallow Groundwater Areas Identification

- ✓ Groundwater within 50 feet of surface
- ✓ Commonly supports numerous private wells
- ✓ May, or may not, have surface water
- ✓ Important for Arizona species
- ✓ Rare and precious in the Sonoran Desert

Identification based on…

- Well data review
- Field vegetation surveys
- Aerial imagery & topographic maps

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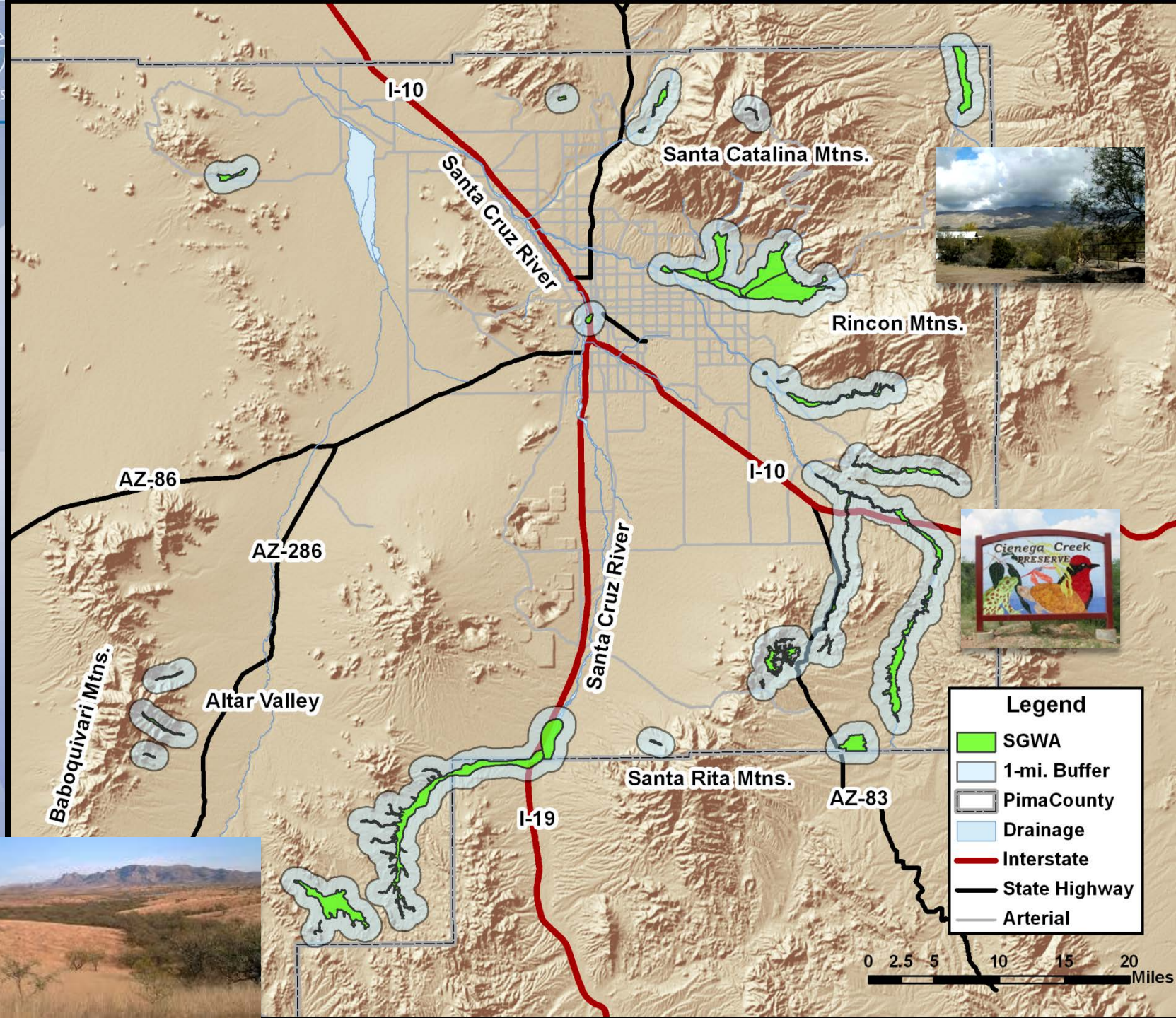
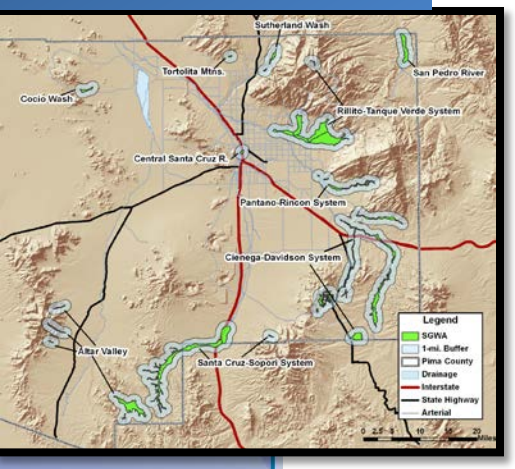
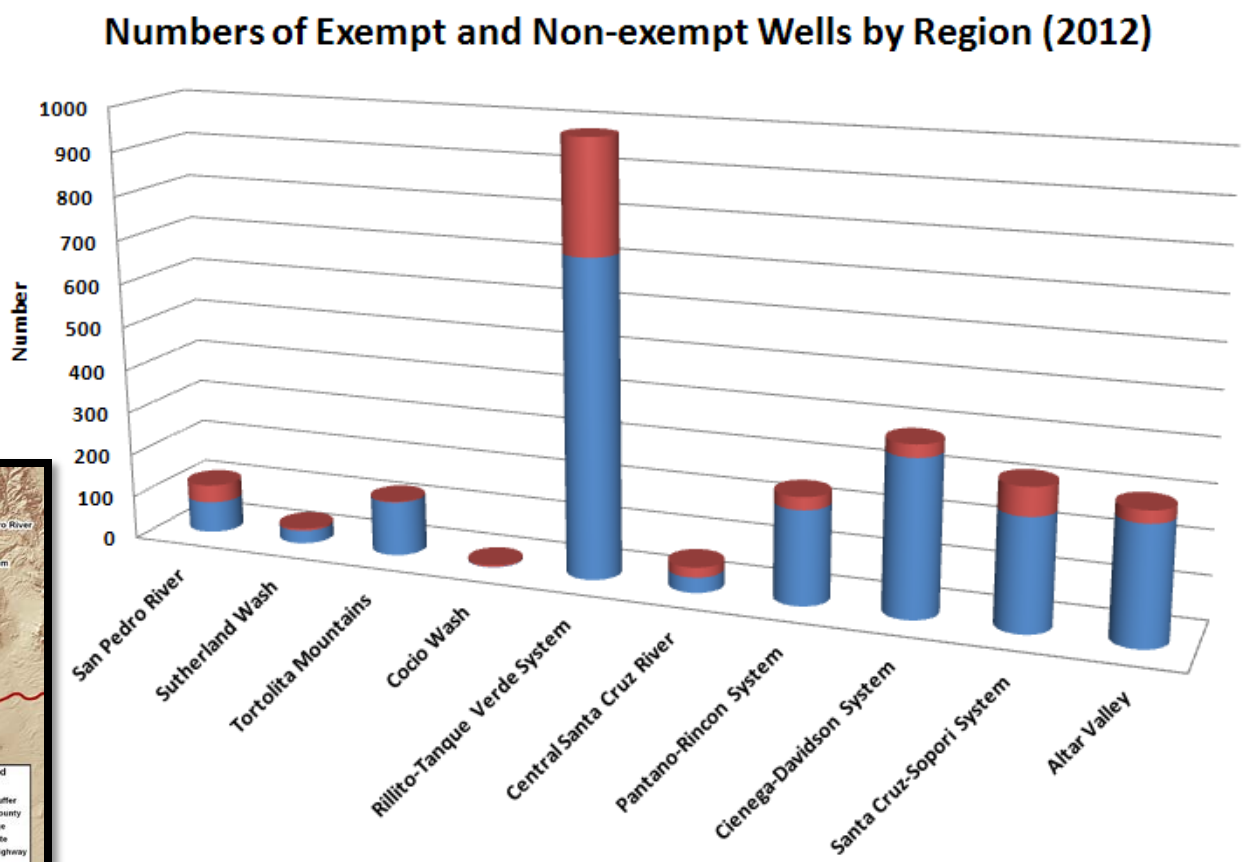
32 Shallow Ground-water Areas



Exempt/Non Exempt Comparison

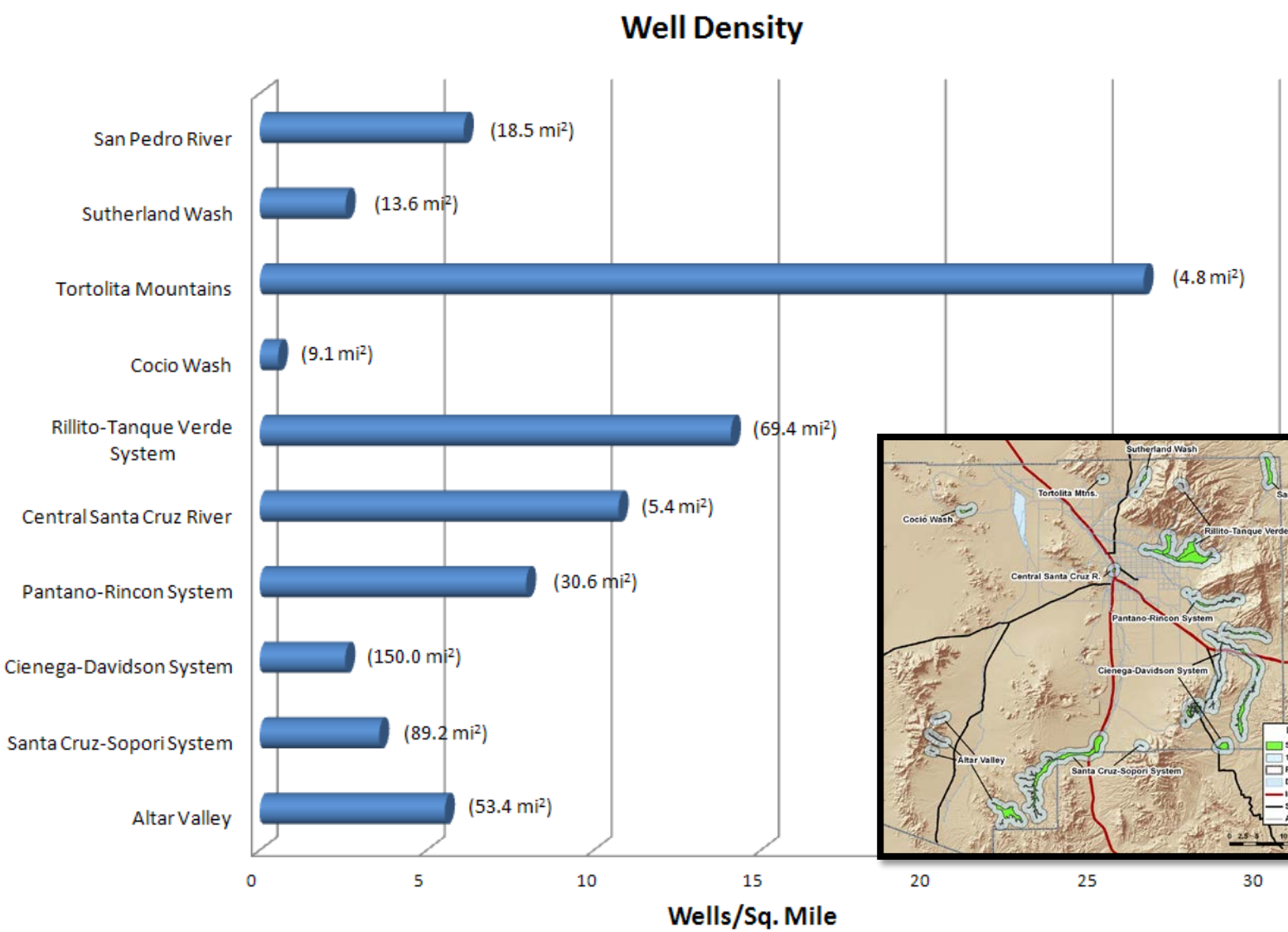
Generally, More Exempt Wells than Non-Exempt



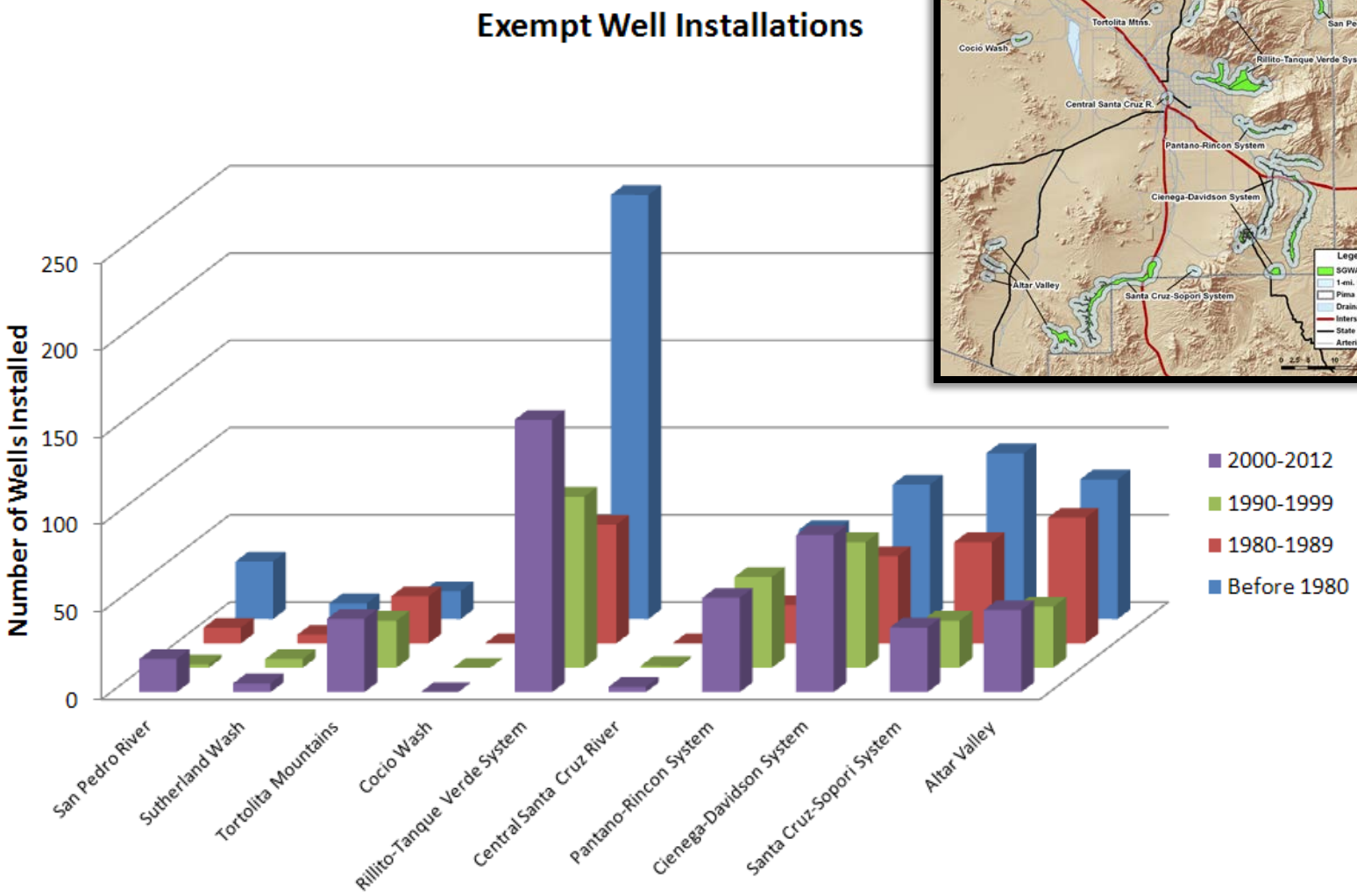


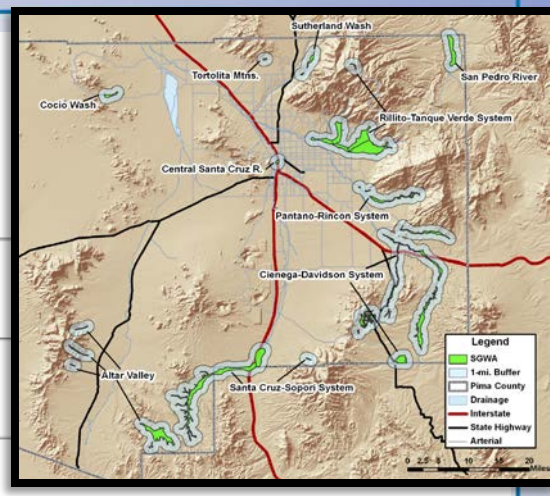
Region	San Pedro River	Sutherland Wash	Tortolita Mountains	Cocio Wash	Rillito-Tanque Verde System	Central Santa Cruz River	Pantano-Rincon System	Cienega-Davidson System	Santa Cruz-Sopori System	Altar Valley
# Non-exempt Wells	41	5	2	4	257	23	29	29	64	28
# Exempt Wells	72	30	125	1	722	35	215	355	255	268

Well Density



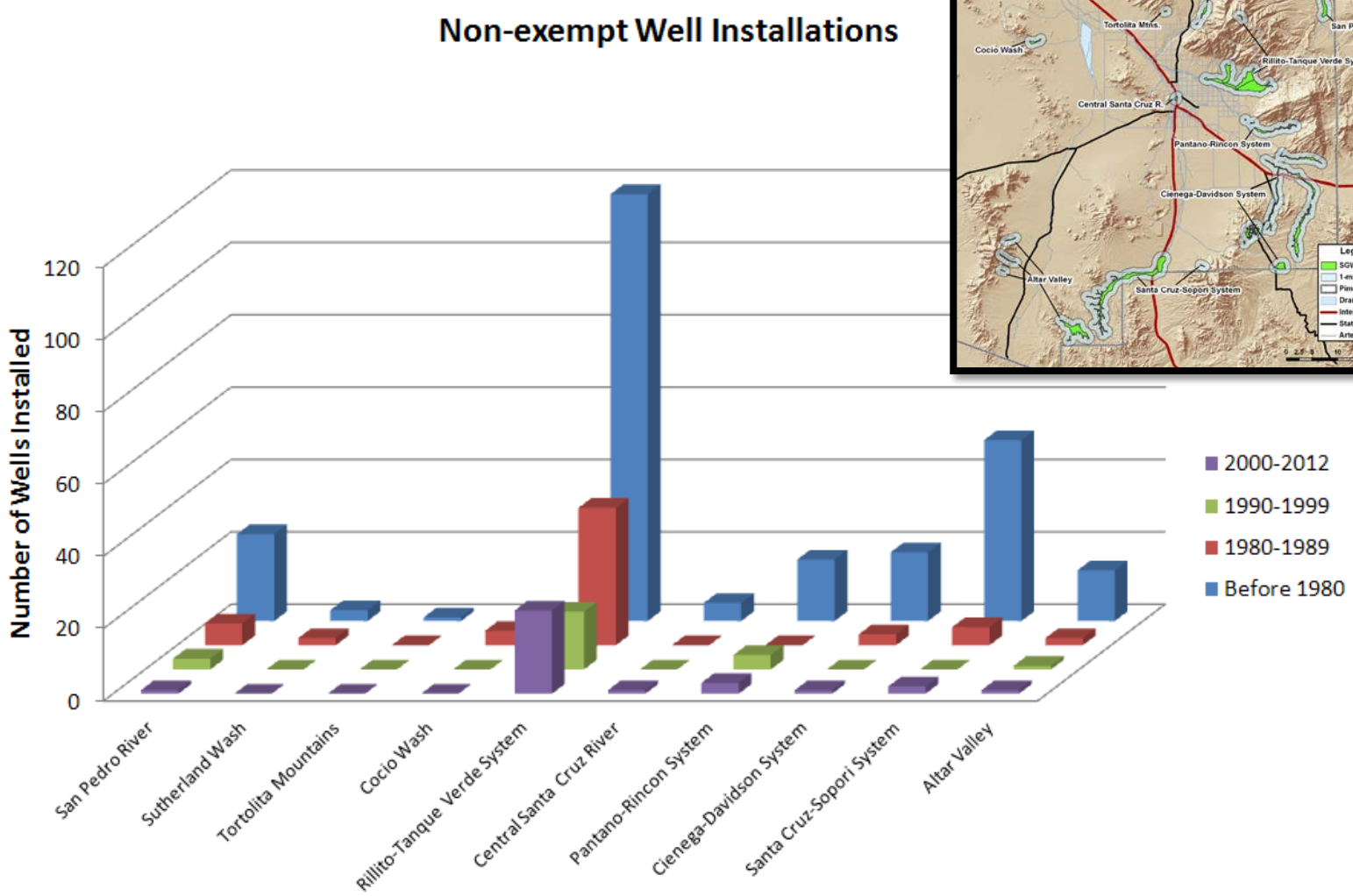
Drilling Trends – Exempt Wells

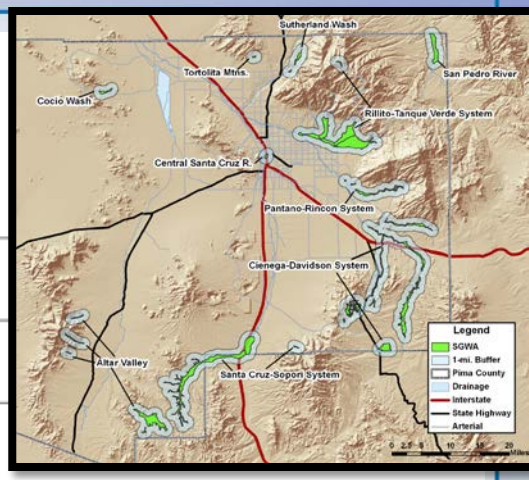




453 of the 486 new wells drilled Since 2000, were exempt

Drilling Trends – Non-exempt Wells





33 of the 486 new wells drilled Since 2000, were non- exempt

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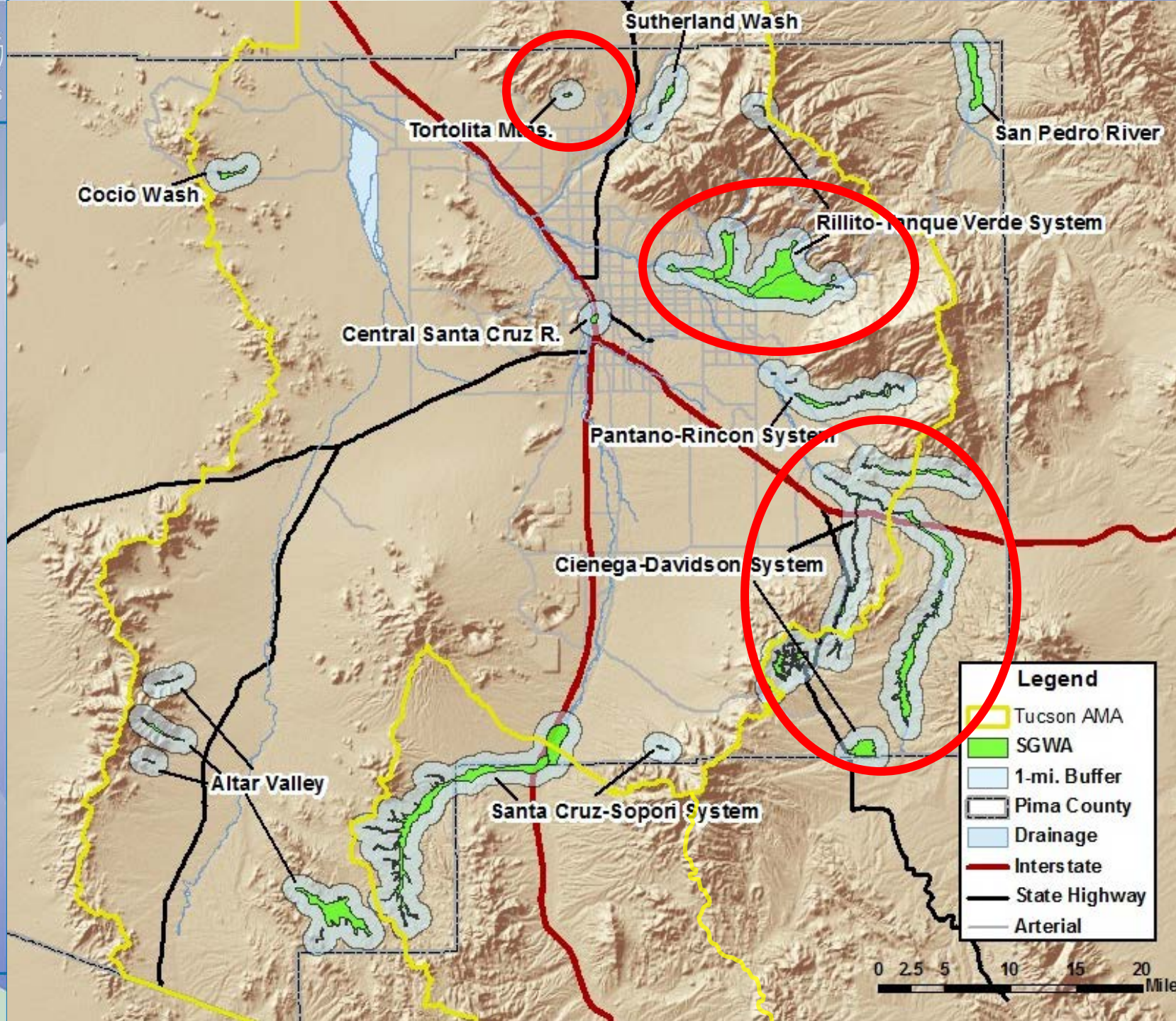
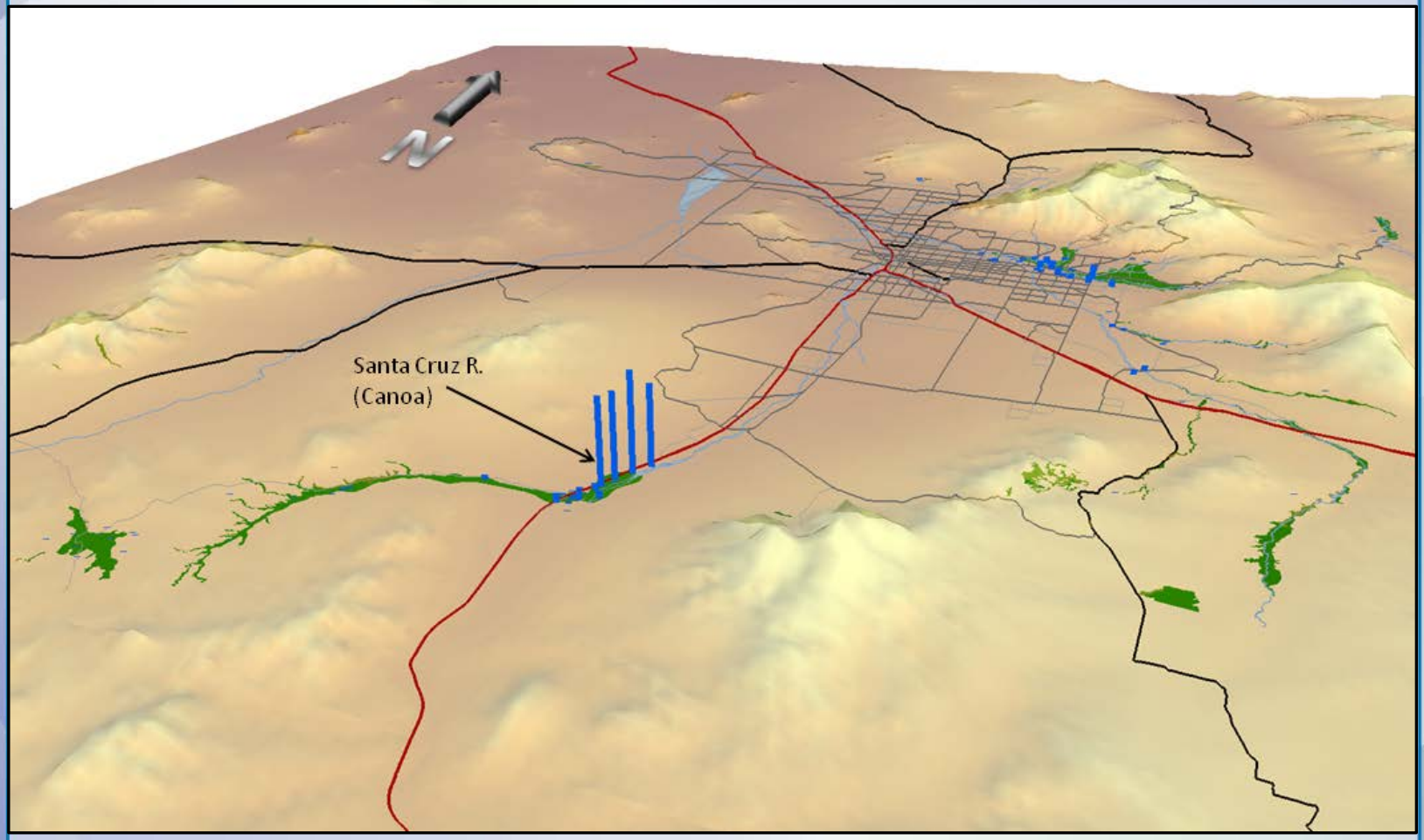
Ten Regions with One-mile Buffers

Water levels and pumping trends



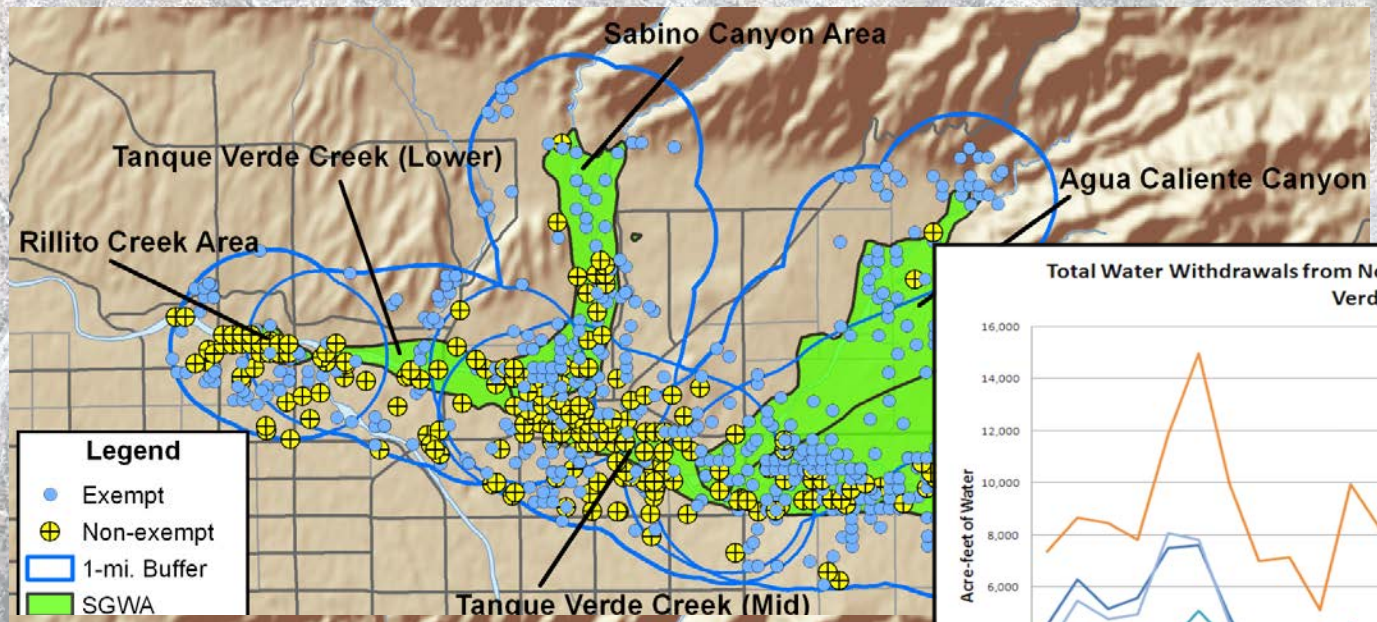
Water Production

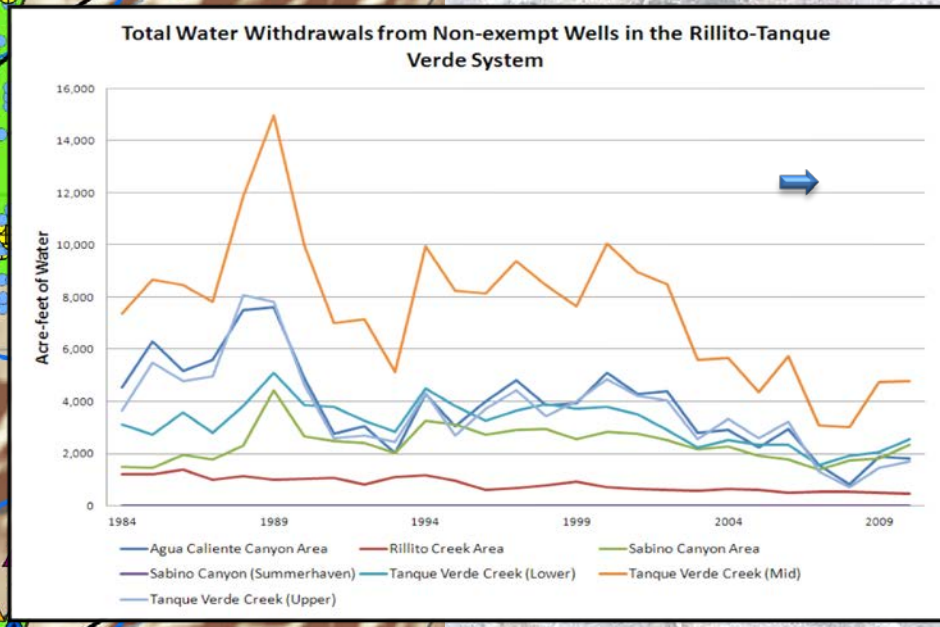
Annual Water Withdrawals by Well (2010)

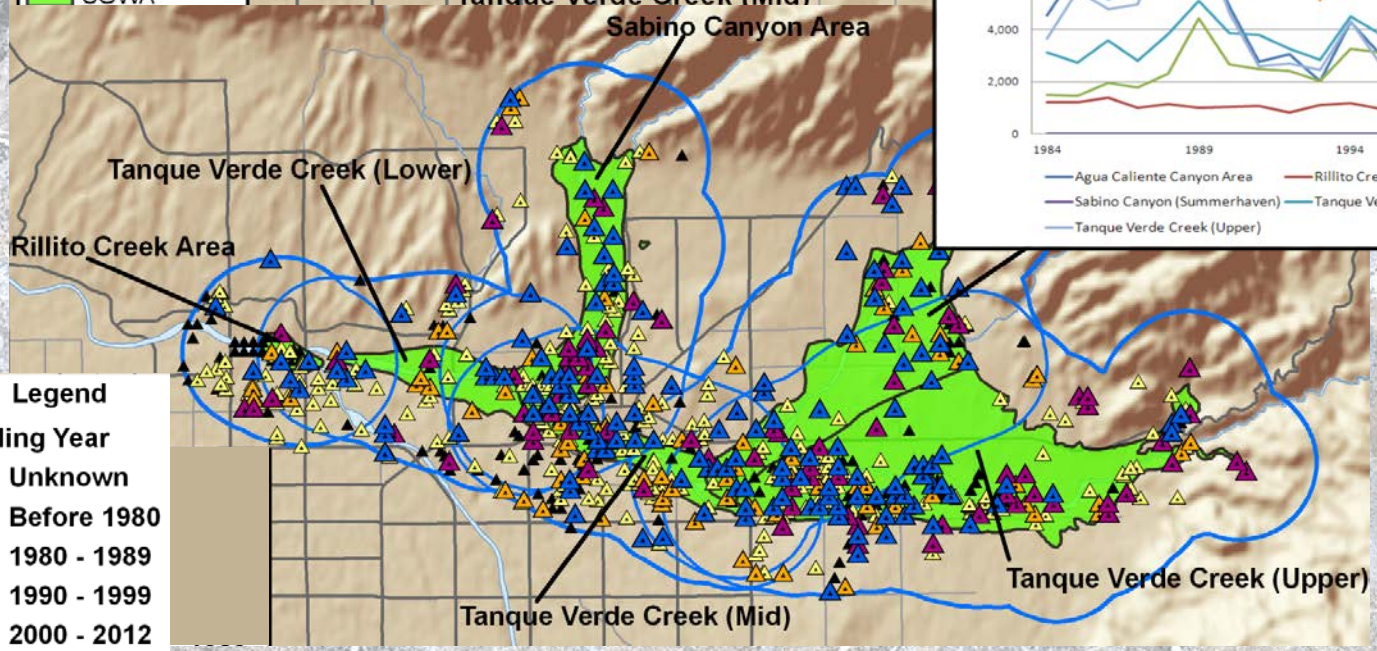


Water withdrawals based on <u>exempt</u> <u>reporting</u> wells only

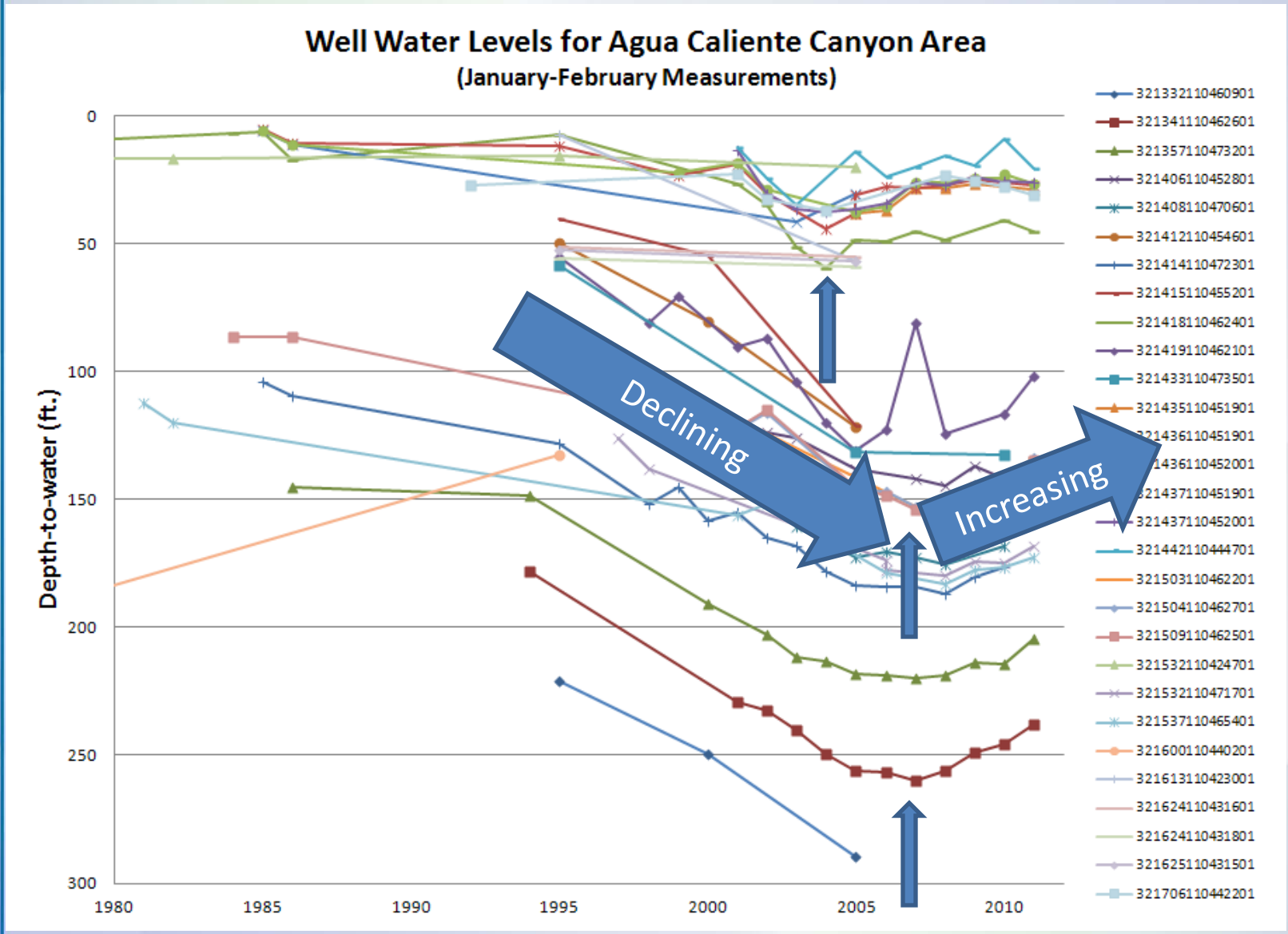
Rillito-Tanque Verde Region



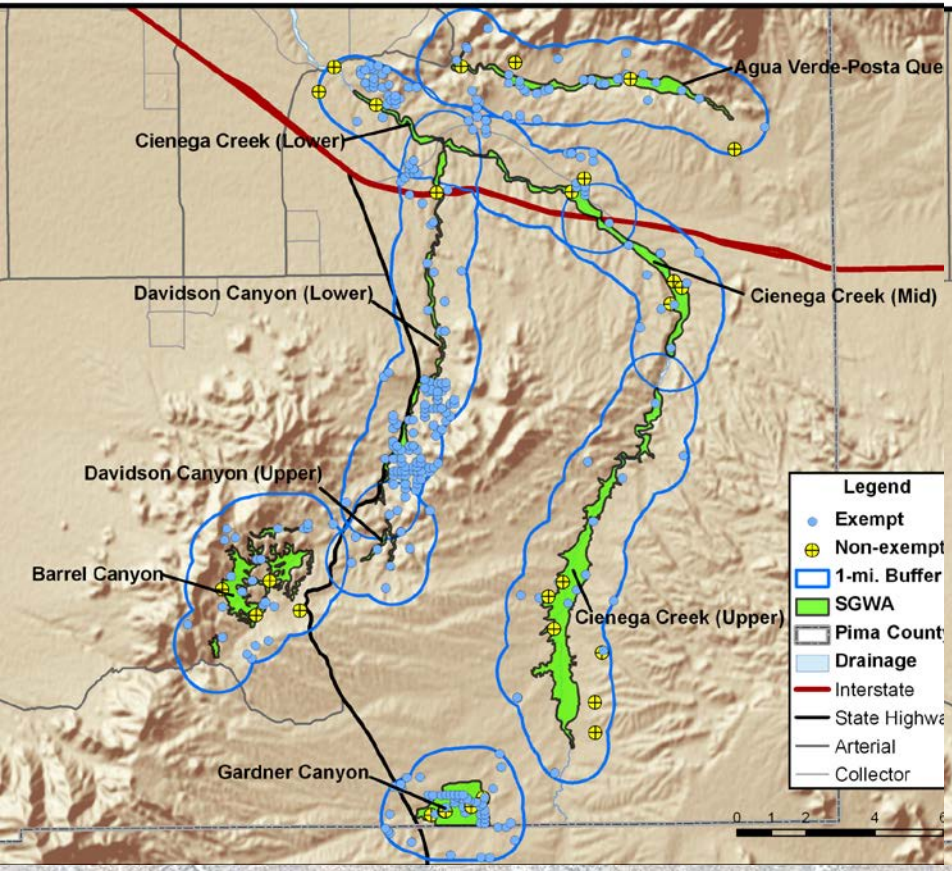


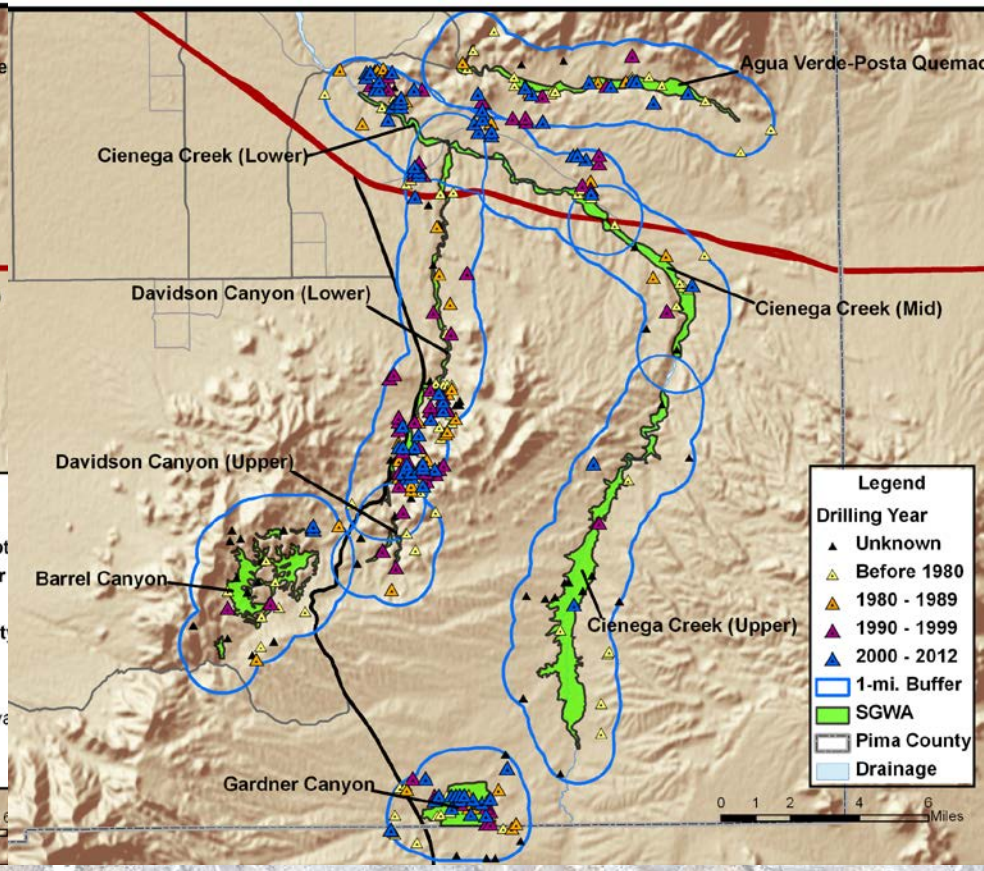


Depth-to-water Trends in Rillito-Tanque Verde System

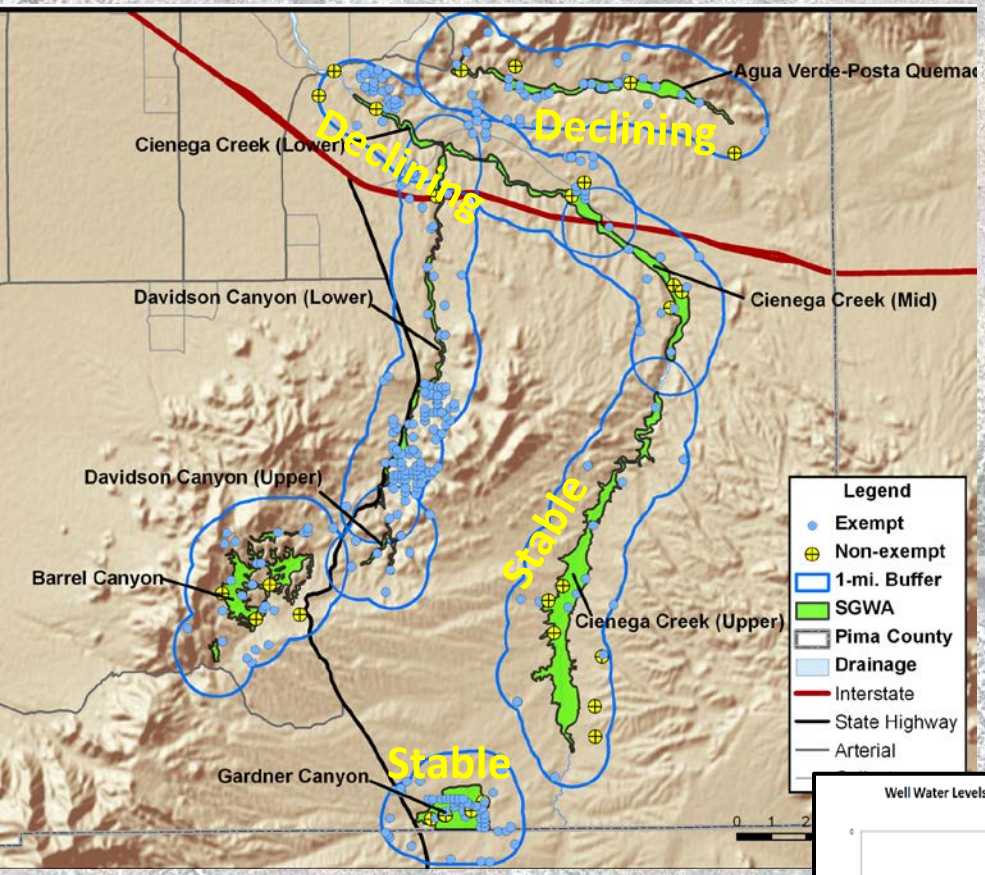


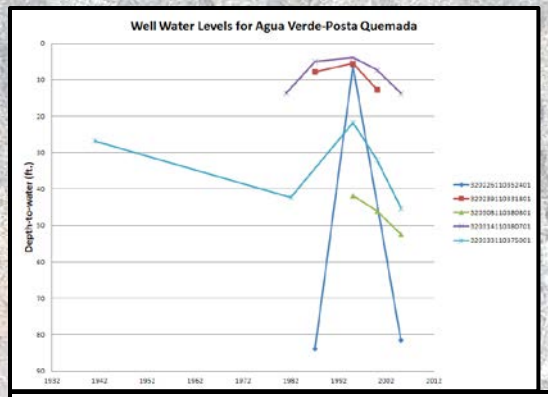
Cienega Creek Region

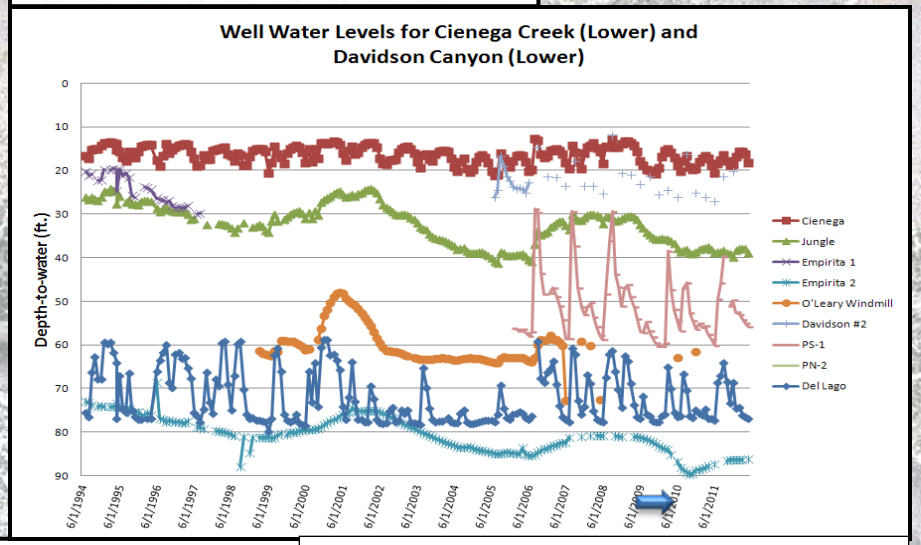


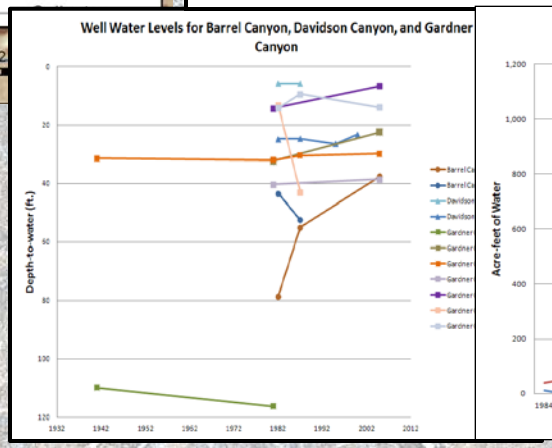


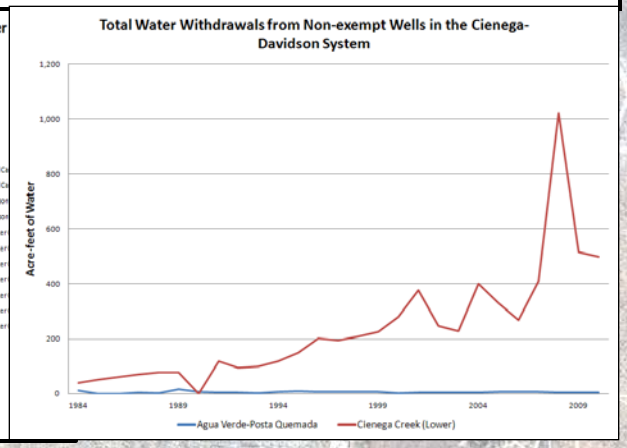
Cienega Creek Region







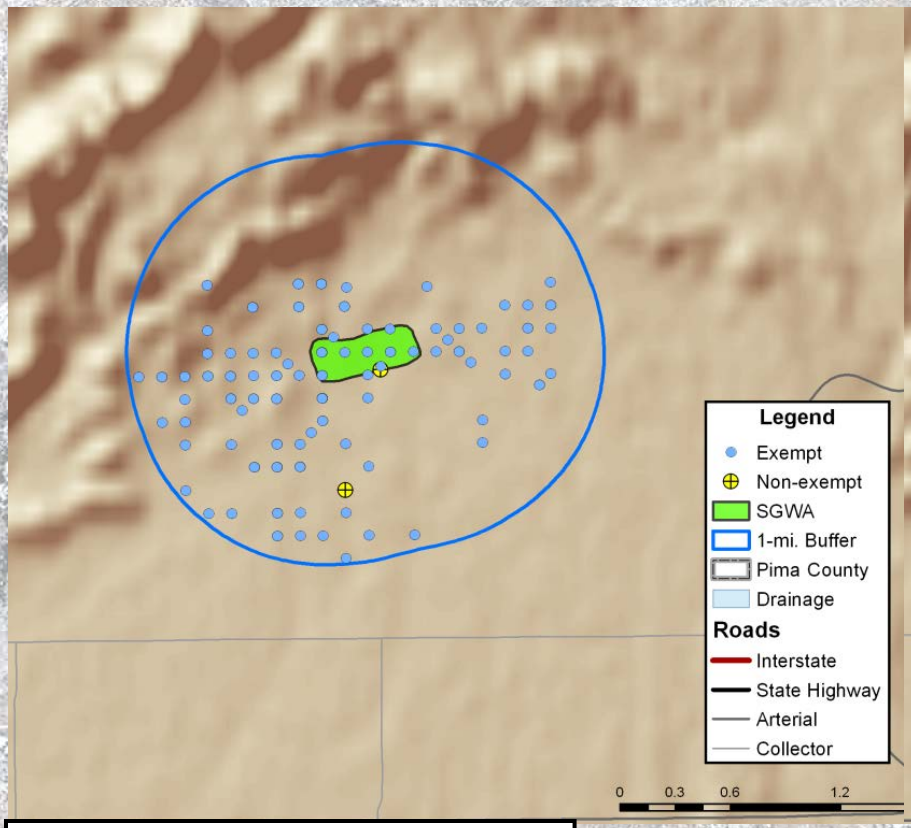


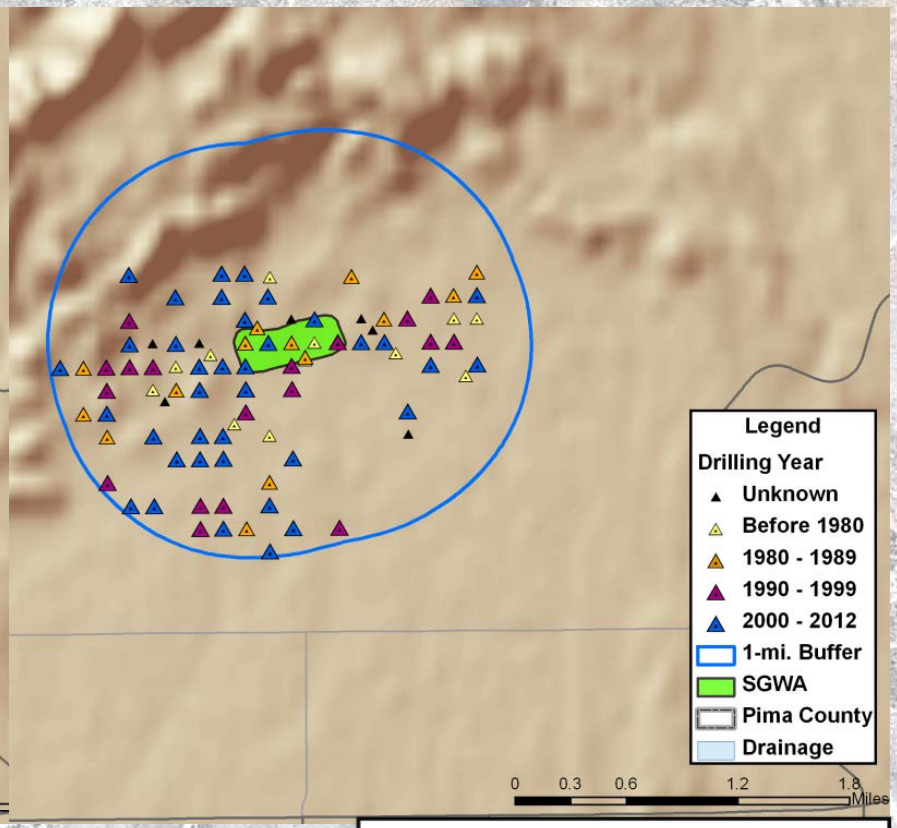


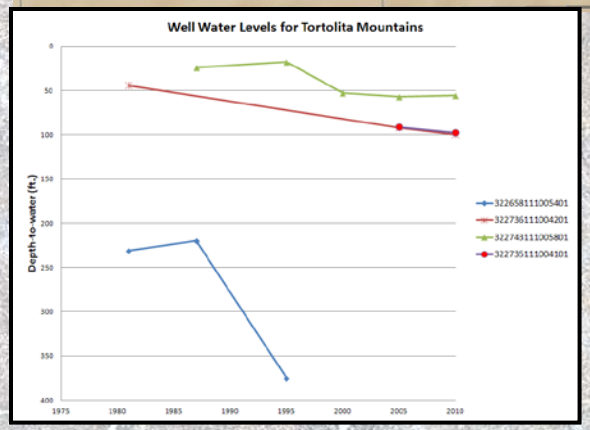
Low-moderate well density
Low-moderate drilling activity
- **Low water withdrawals**
- **Stable, declining, inconclusive**

Tortolita Mountains Region

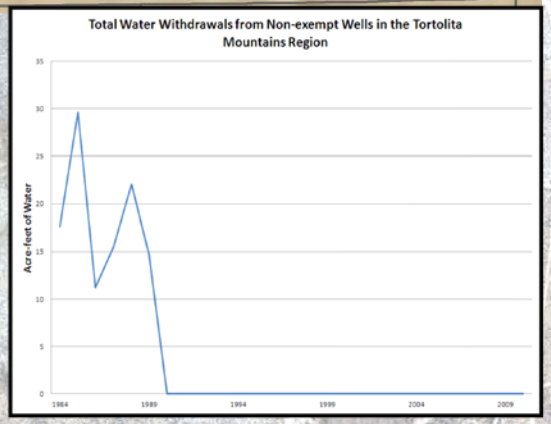
3



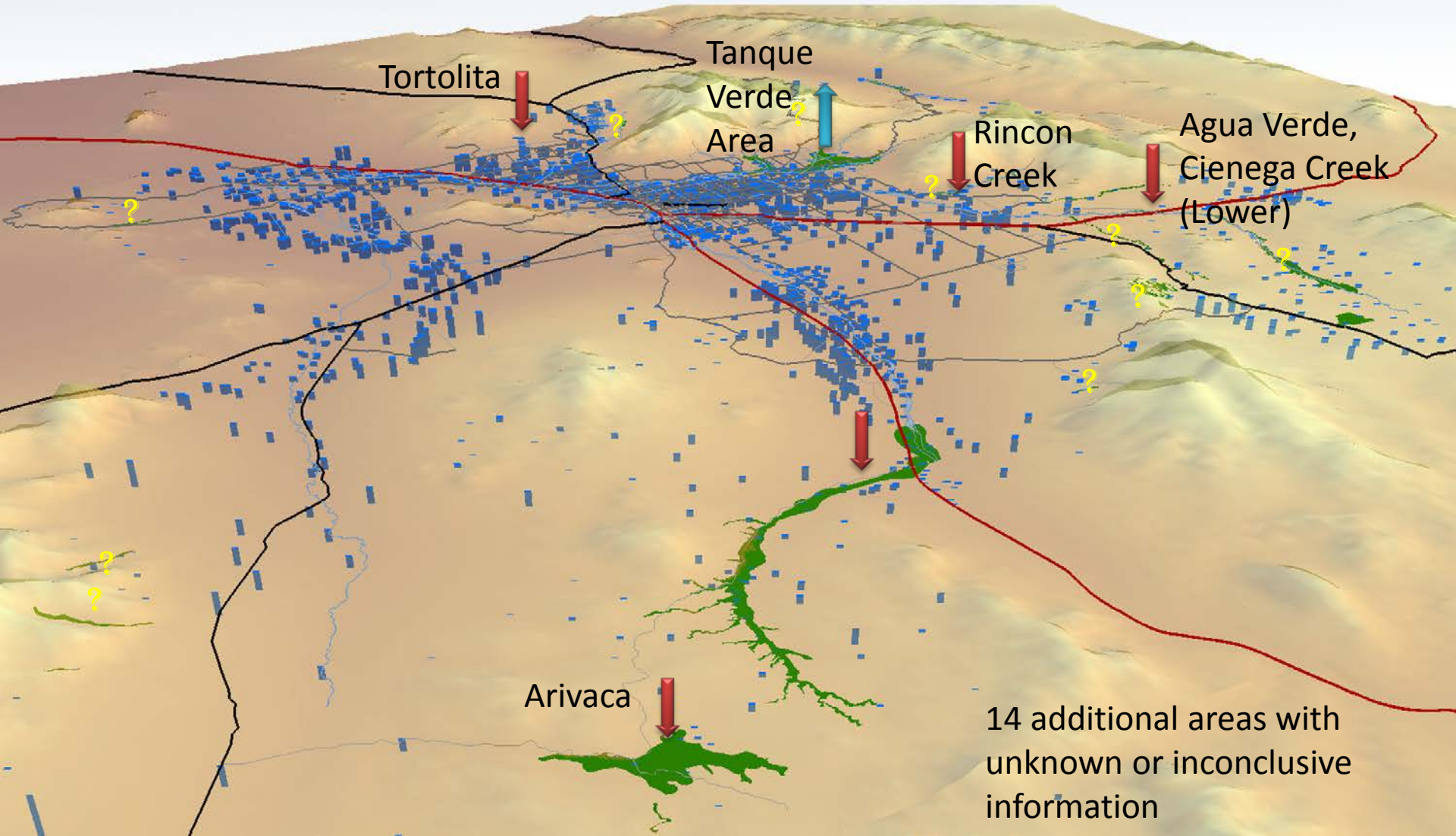




- ✡ ✡ Very high well density
- ✡ Moderate drilling activity
- ✡ Moderate water withdrawals
- ✡ ✡ Declining water levels

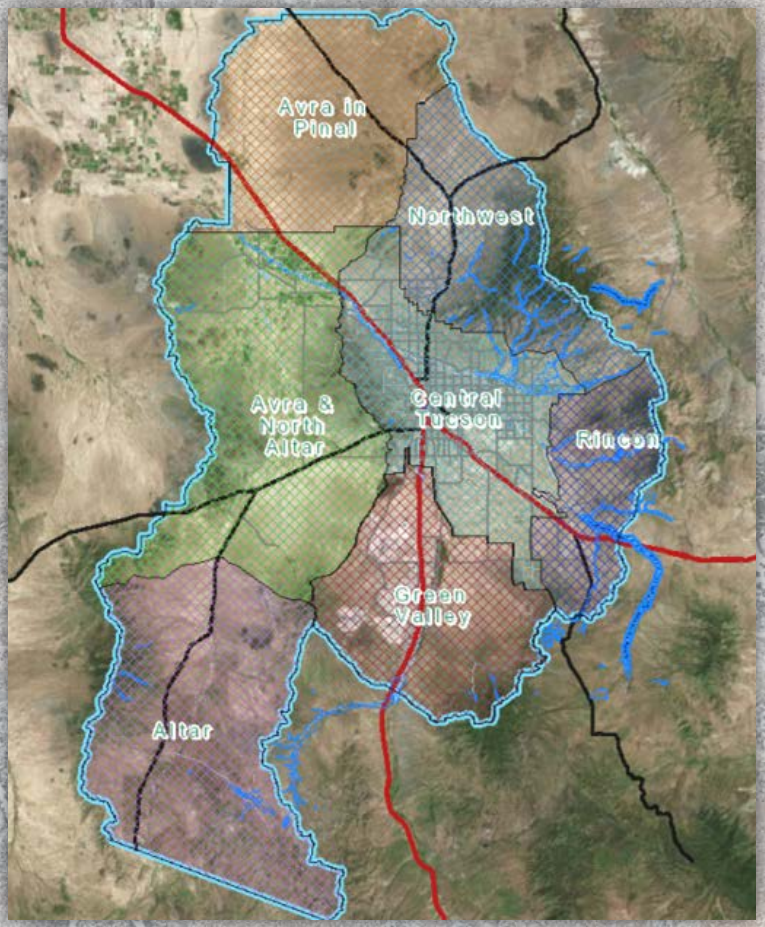


Declining Shallow Groundwater Areas



What Happened Next?

- Region-wide Awareness
  - Common knowledge
  - Mayors 2 year plan
  - Safe Yield Task Force accounting areas
  - Cienega Watershed Partnership Outreach
  - Part of the climate change/drought discussion – private well owners messaging
- Studies and Grants
  - Community Water Coalition, Outreach Grant (WILD Western Institute for Leadership Development)
  - Watershed Management Group, American Rivers, Sabino Cyn



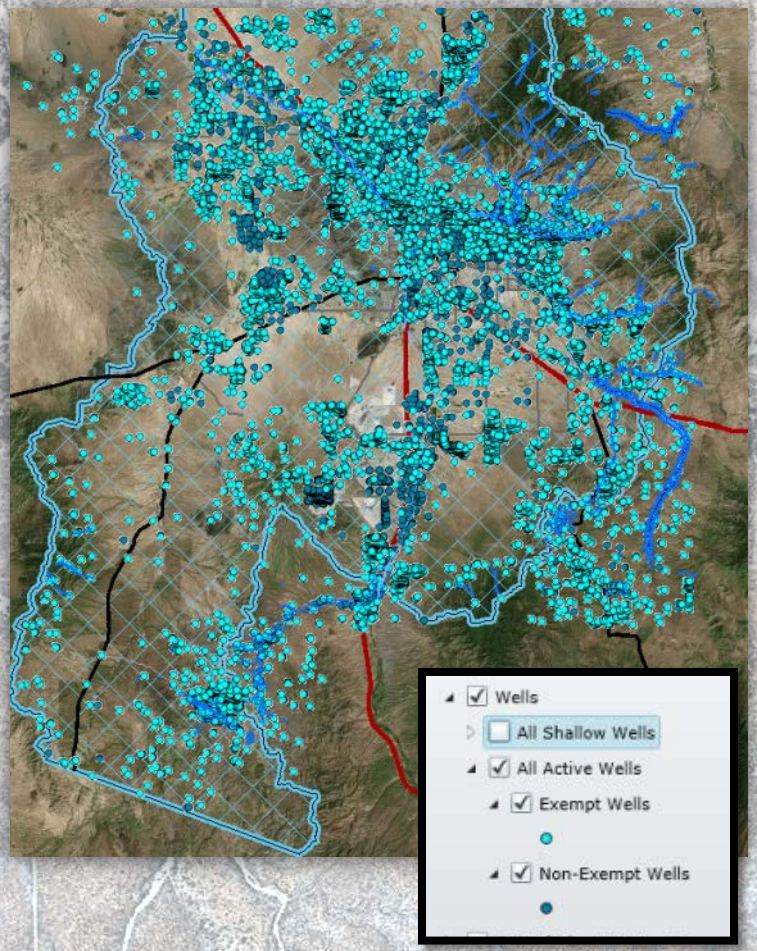
Water Accounting Areas

- In response to ADWR enhanced aquifer management discussions
- SGWAs were a key driver
- ADWR is taking the next step
- data will be available for each accounting area.

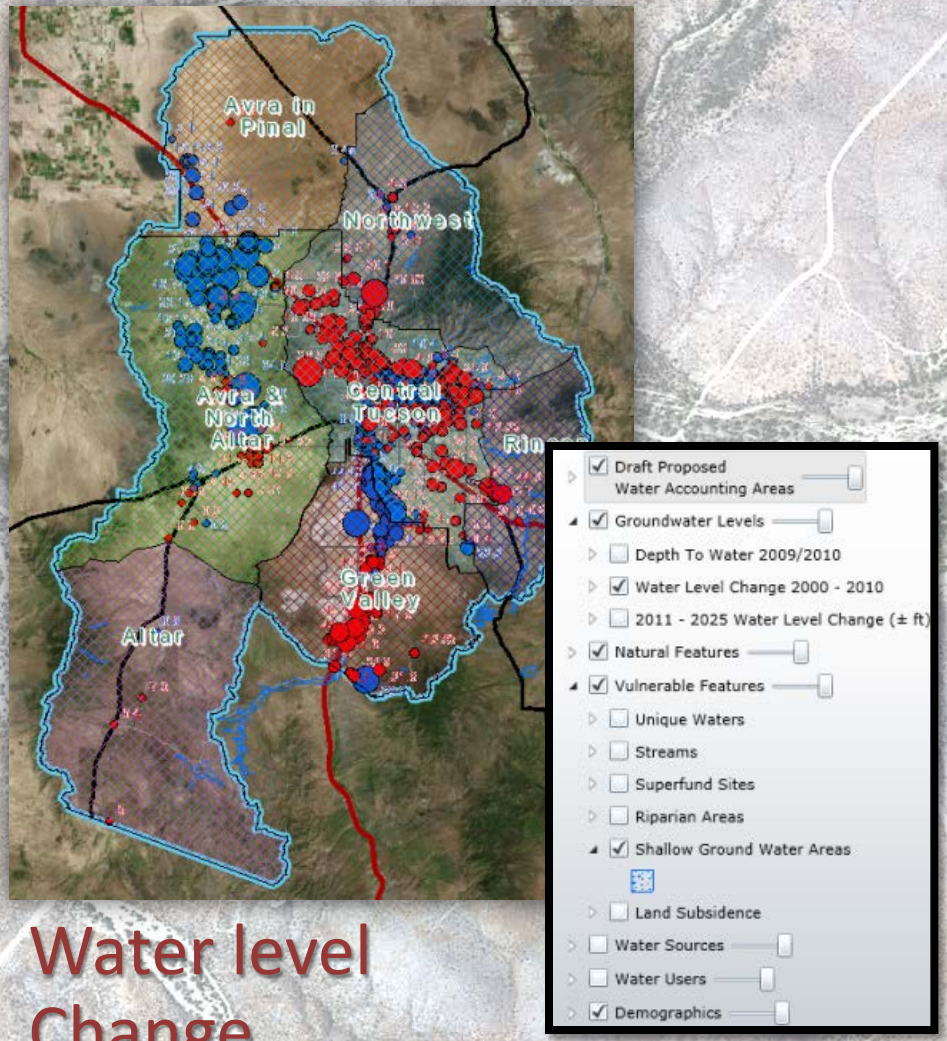
PAG's Interactive Maps

View Pima Association of Governments' interactive maps containing Geographic Information Systems (GIS) data for the Tucson metropolitan area.

- Air Quality Monitor Sites and Maintenance and Nonattainment Areas
- Census 2010/CDPs
- EV Charging Stations
- Green Infrastructure Planning Tool
- Orthophotos
- PAG School Search
- Transportation Analysis Zones
- Traffic Counts
- Understanding Water

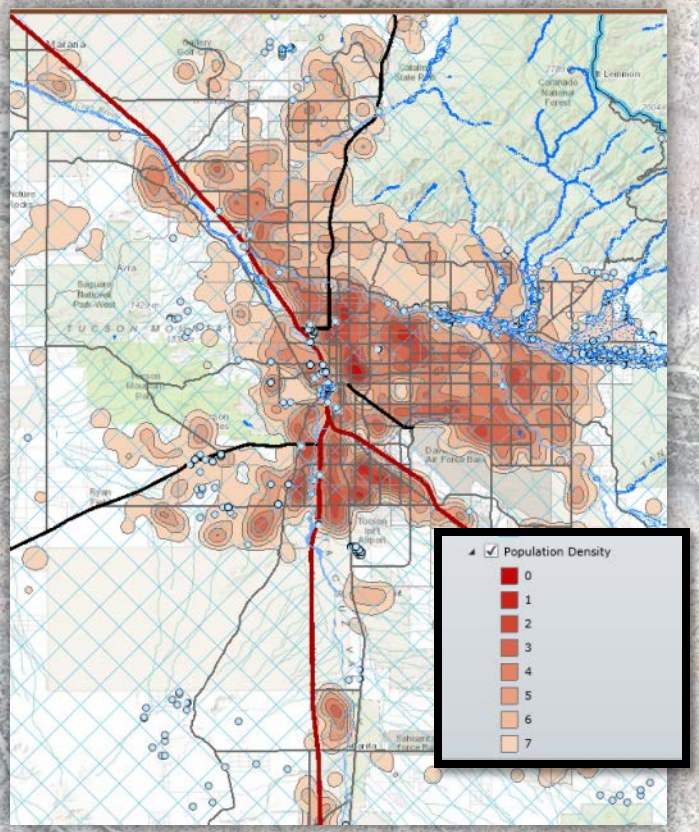


Wells: exempt/non-exempt

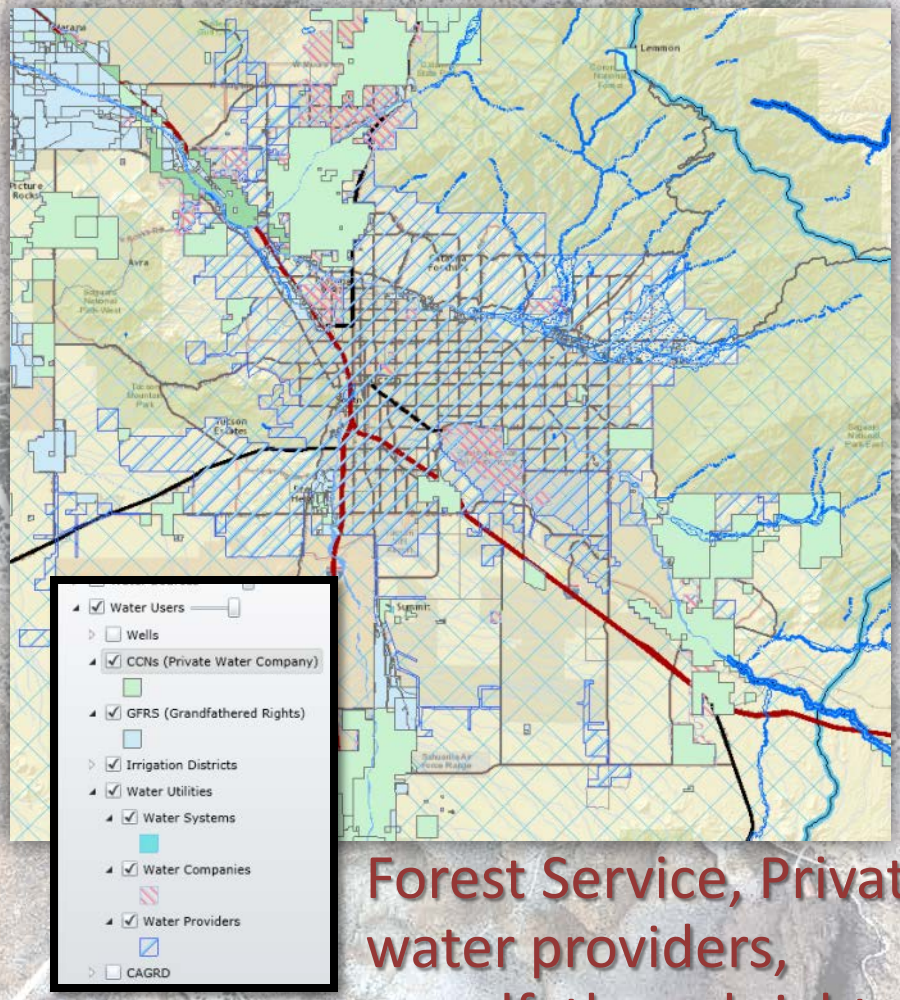


Water level Change

Part of a PAG web-based Planning Tool



Population



Forest Service, Private water providers, grandfathered rights

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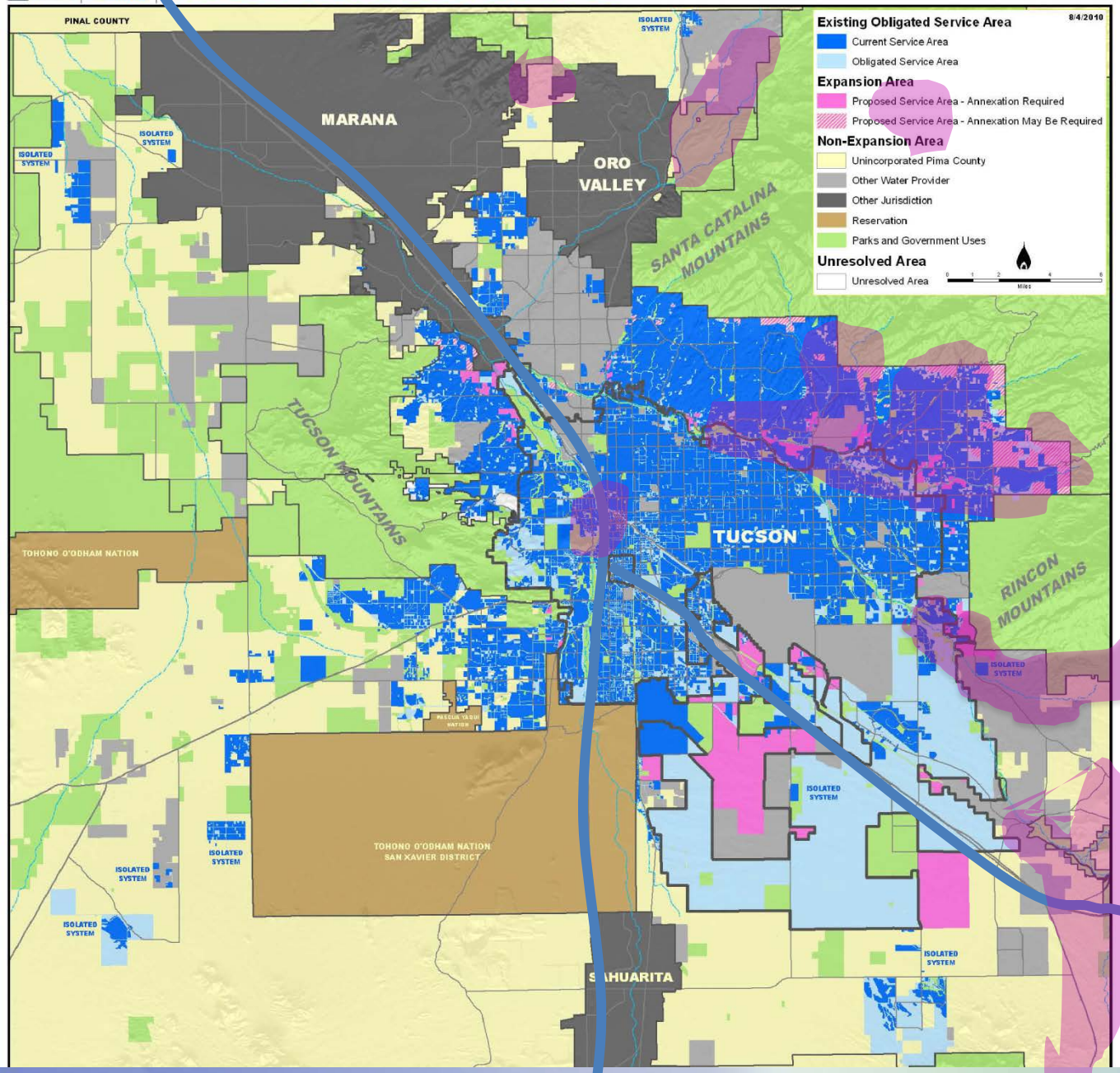
Tucson Water Service Area



Changing
Conditions
Hotter
Drier
More of us

Drought Planning

- Consider different responses, ie local conditions vs CAP supply
- Be aware that private well pumping will likely increase with local drought and heat
- Consider restoration possibilities in shallow aquifer (head water) areas

Conservation Planning

- Target outreach to address high water users in foothills areas
- Extend outreach to private well owners and neighboring utilities
- Support a regional private well owner outreach effort
- Promote rainwater harvesting in private well owner areas

Utility Planning

- Consider extending water lines into shallow groundwater areas
- Include sgwas in statewide and regional water resource discussions
- Avoid bad publicity for private well and riparian impacts

Questions?

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