



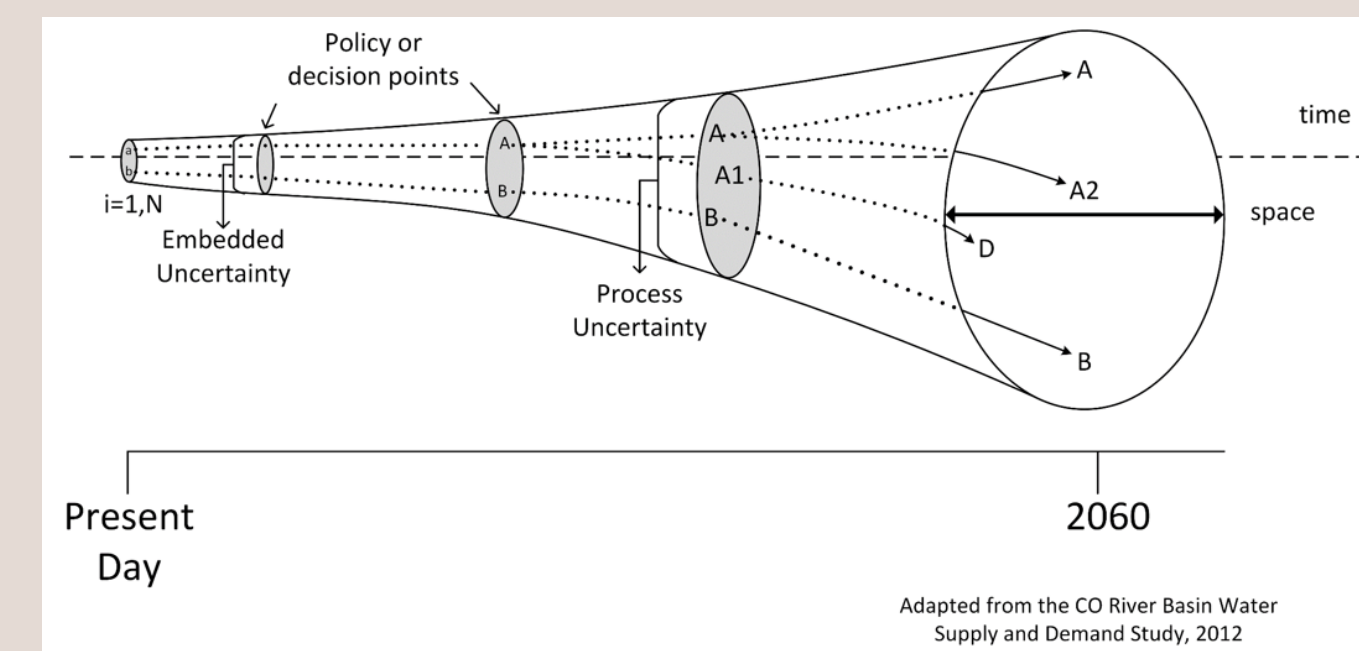
In Brief:

- The Colorado River and the Salt-Verde Rivers of AZ, together, supply most of the municipal water used in the Phoenix Metro Area
- We are in the twentieth year of drought (surface supplies are reduced)
- The Sustainable Futures Scenarios project co-developed potential, future, scenarios for 2060
- The Strategic scenario has:
 - Rainwater harvesting
 - Gray water use
 - Urban infill/ increased density of development
 - Use of reclaimed water
 - Reduced agriculture



WaterSim 6

WaterSim uses advanced scenario analyses to explore the impact of policies and strategies on water sustainability goals in the face of multiple stressors: population growth, climate change, and drought (Sampson et al. 2016).



Land-cover land-use change for the Phoenix Metropolitan Area permits alternative growth scenarios; we can assess the impact of changes in water use sectors (i.e., agriculture) and housing density on water demand.

Alternative water supplies (e.g., rainwater harvested, gray water, and stormwater) supplement potable water for meeting outdoor water demands (Sampson et al. in preparation).

Key Results:

Regionally

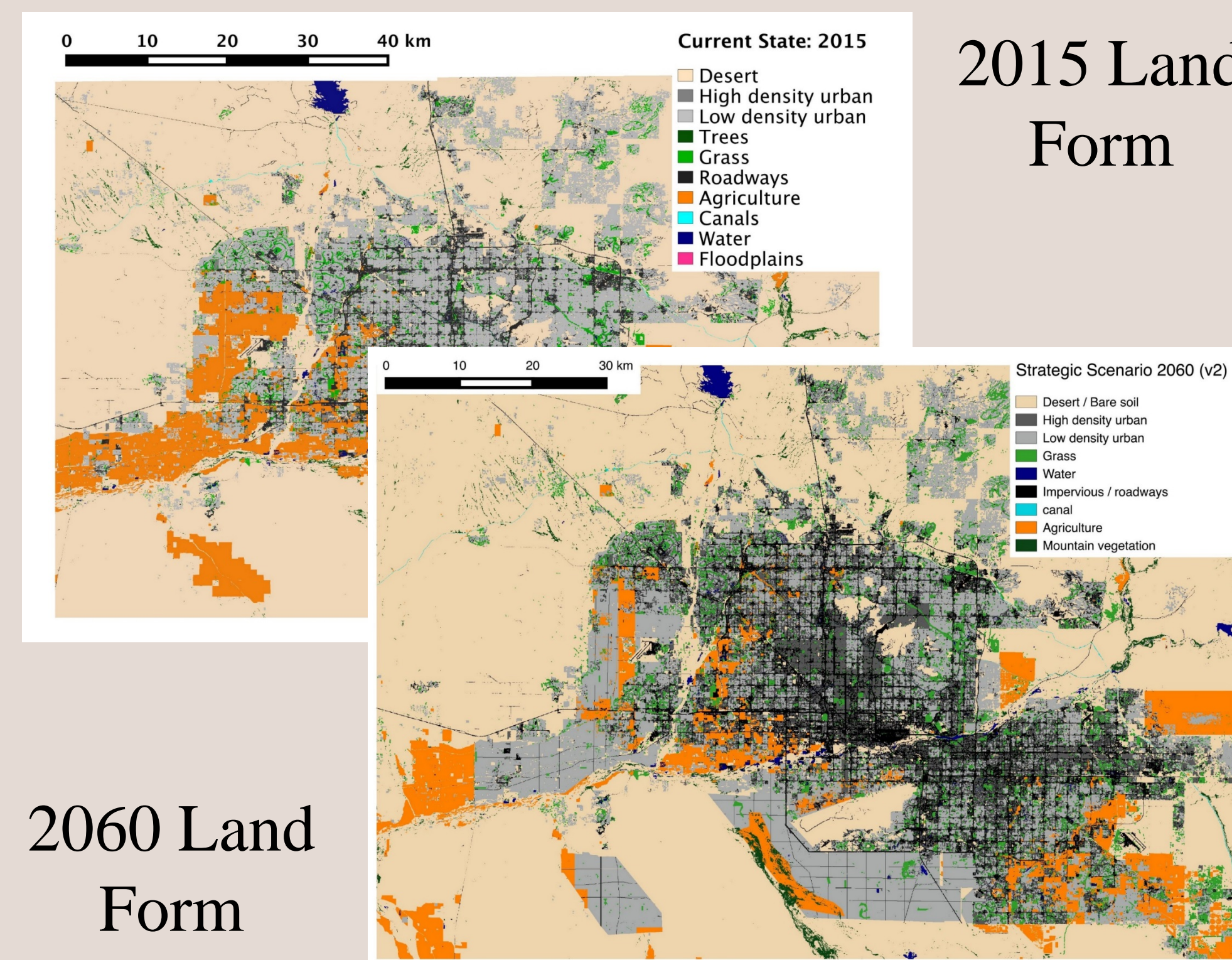
- Captured rainwater could meet 7% of all outdoor water demands, but as much as 28%
- Diminished surface water supplies were offset by rainwater, gray water, and reclaimed water, but also increased municipal pumping
- Increased water use efficiency and growth management, together, could reduce outdoor water demand by 100% or more

Locally

- Significant difference in rainwater harvested among individual water providers. Mean outdoor water demand met varied ten fold (3-40% met)
- Stormwater produced 0.2 to 2 gallons ft²; rainfall could generate 0 to 325k acre-feet yr⁻¹

Outdoor Water Demand and Rainwater/Stormwater Production: WaterSim 6

Land-Cover Land-Use as Inputs



Three million new residents

Simulations Manipulated:

- Rainfall
- Runoff (RCP 8.5)
- Policy adoption rate & Timing of implementation
- Population growth rate
- Water use efficiency

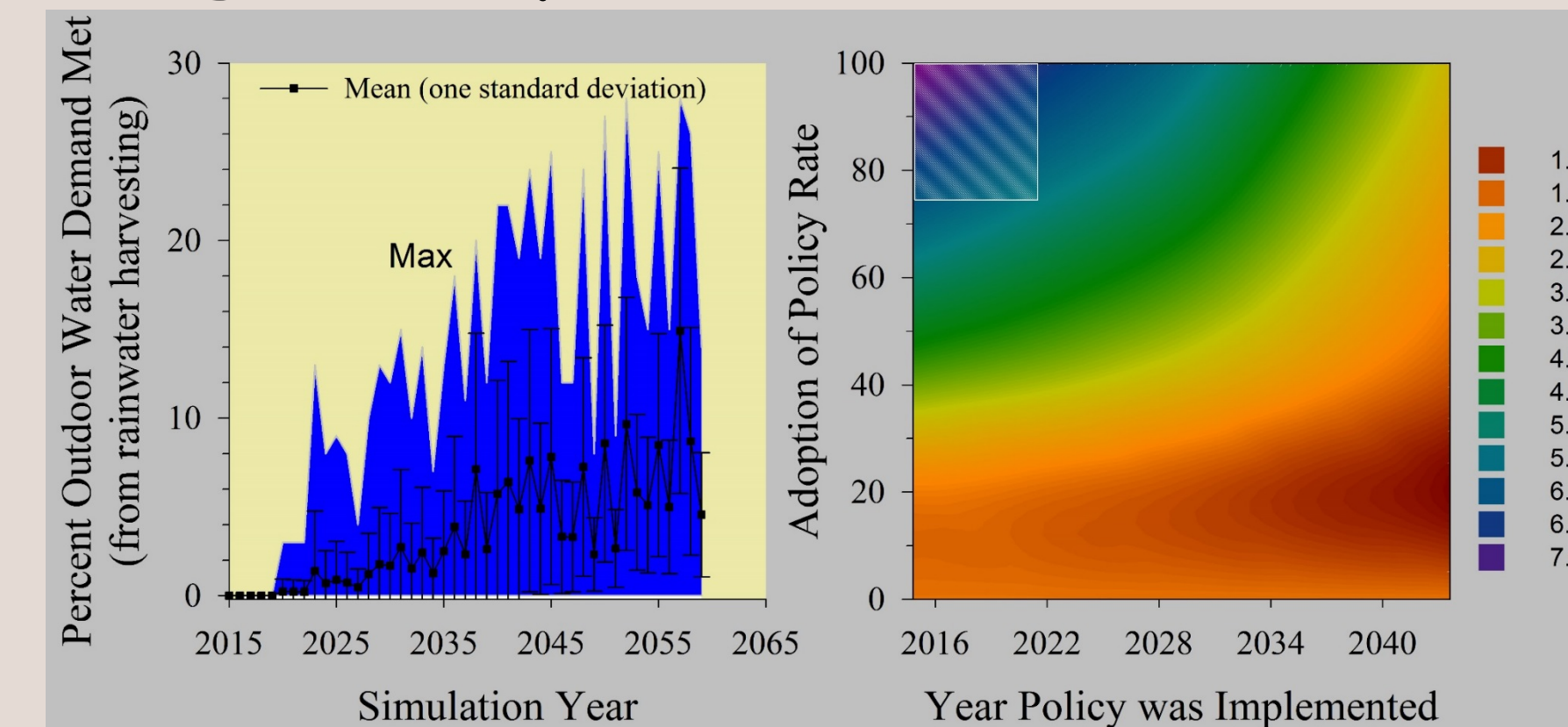
10,000 Scenarios
21,700,315 observations



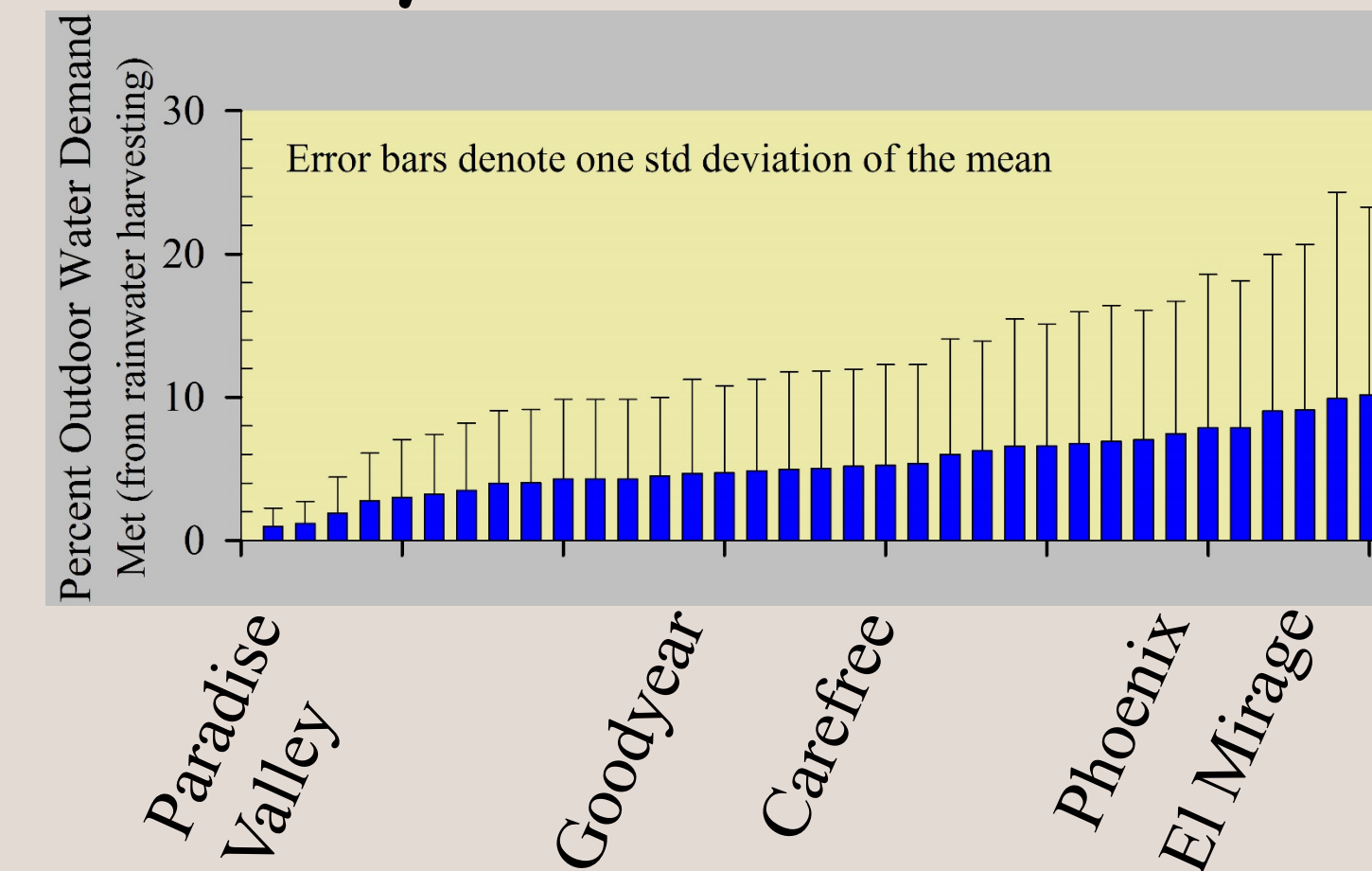
References

- Sampson, D.A., R. Quay, D. White. 2016. Anticipatory modeling for water supply sustainability in Phoenix, Arizona. *Env. Science and Policy* 55: 36-46.
- Sampson, D.A., E.M. Cook, M.J. Davidson, N.B. Grimm, D.M. Iwaniec, X. Li. Simulating Alternative Sustainable Water Futures for the Phoenix Metropolitan Area using WaterSim 6. In preparation.

Regionally

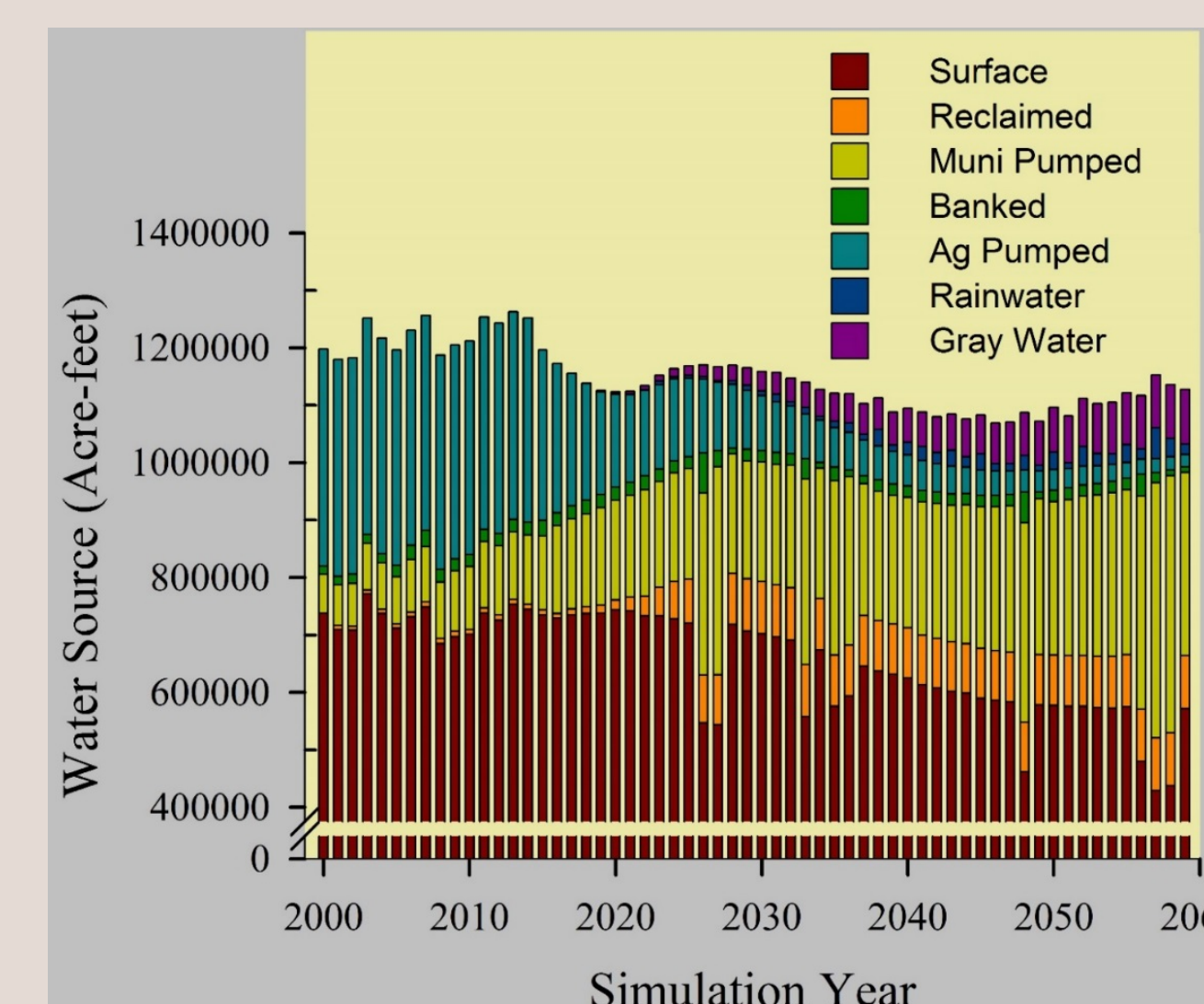


Locally

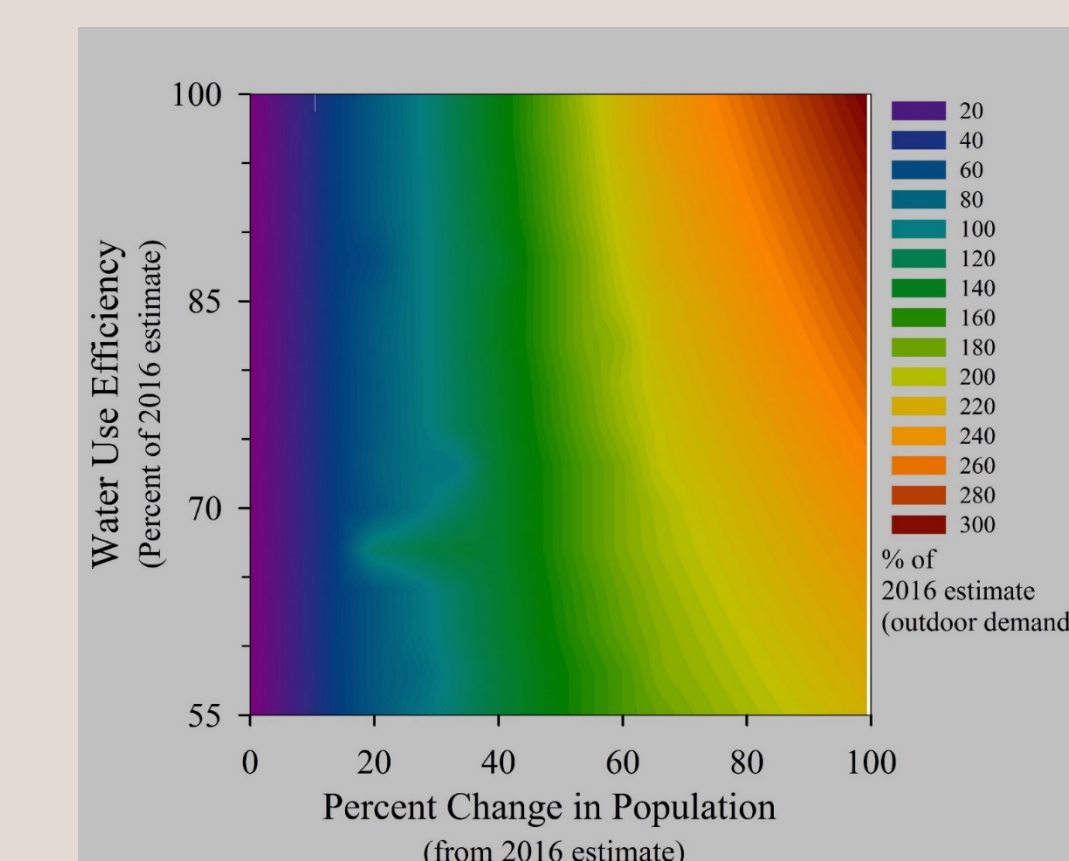
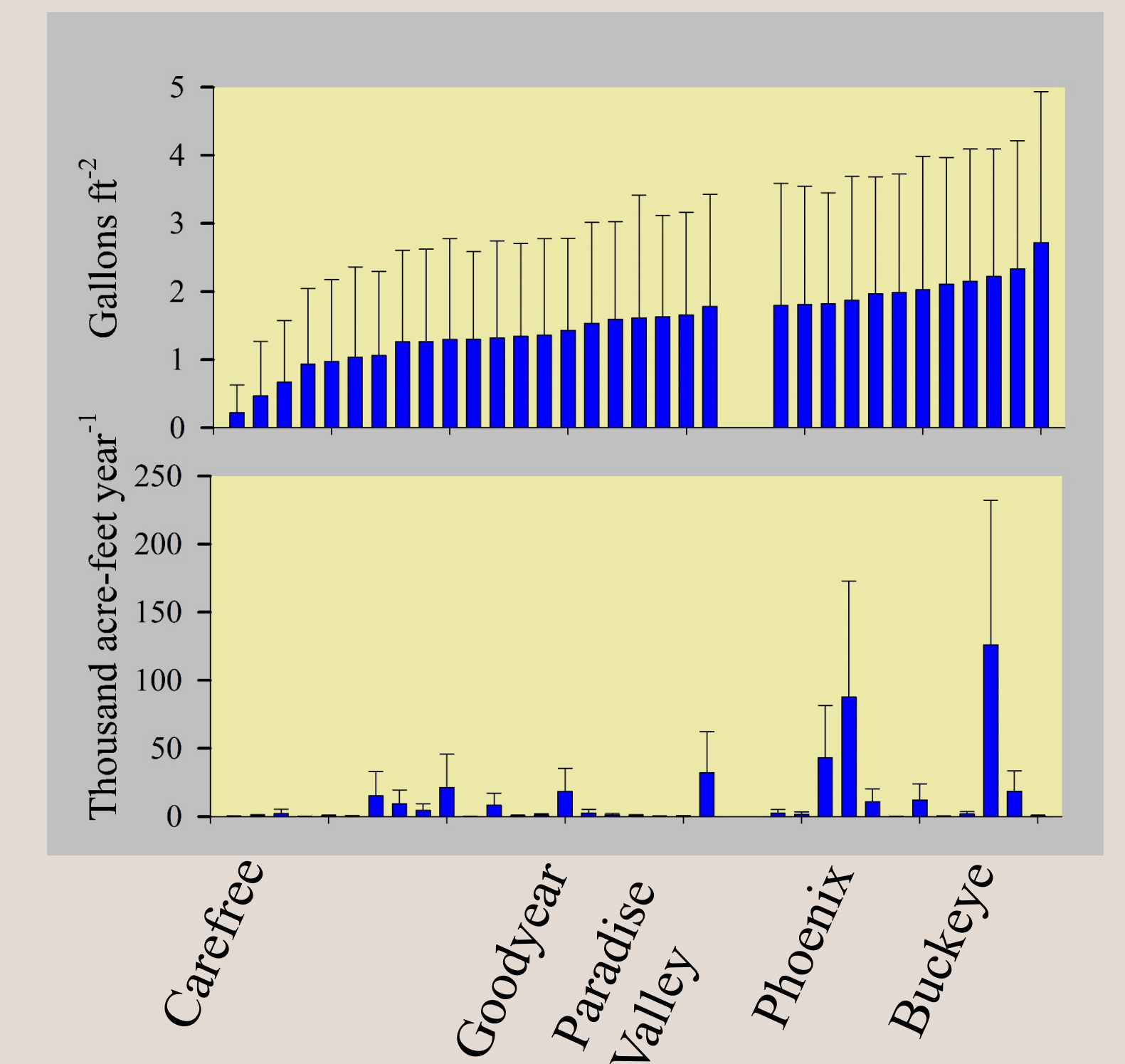


Rainwater Harvested

Water Source



Stormwater Runoff



Outdoor Water Demand

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