



The Comparative
Genetics of Cities



Decision-making about water in Phoenix



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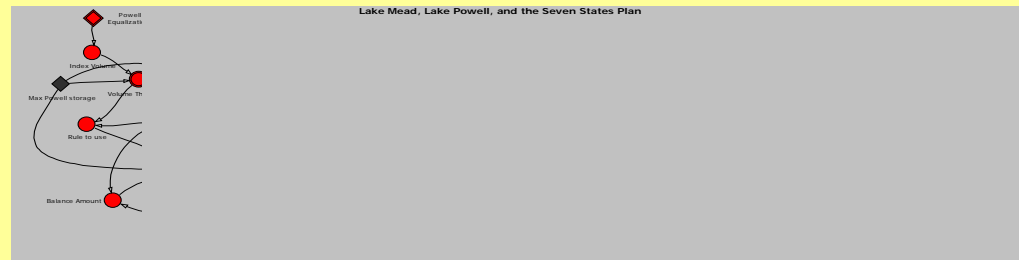


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Decision Center for a Desert City

- Urban water decision-making under uncertainty
- Regional stakeholders engaged from start to finish
- US NSF's largest social science grant (\$14M)
- Decision Theater helps explore alternative futures
- Could also apply to air pollution, energy, traffic, food





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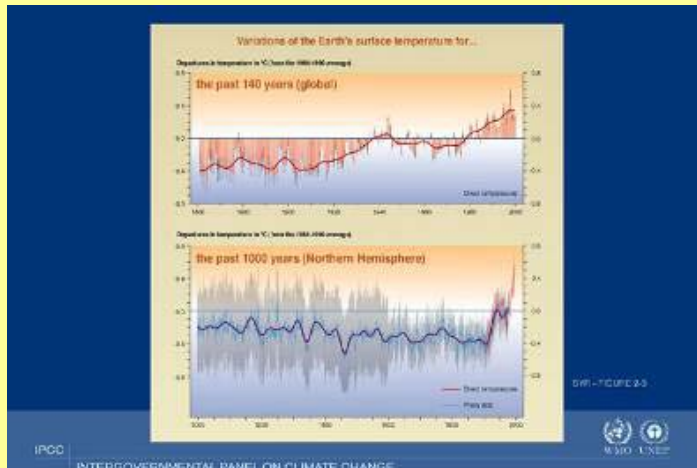


Phoenix has three water sources: Aquifers, Colorado River, Salt-Verde Rivers

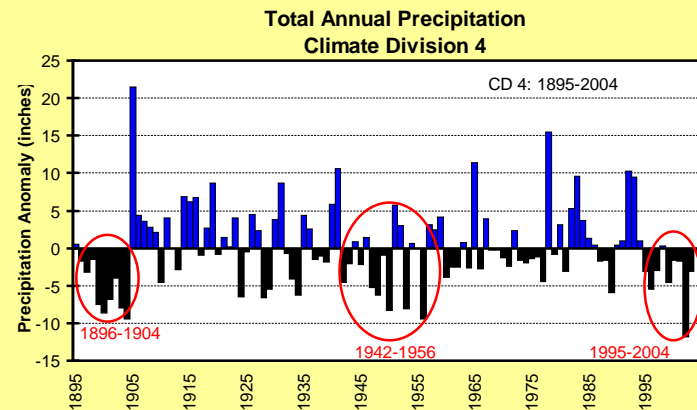




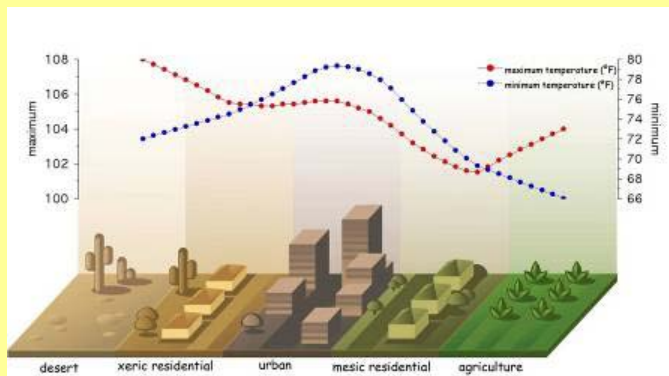
Sources of Phoenix's water uncertainty



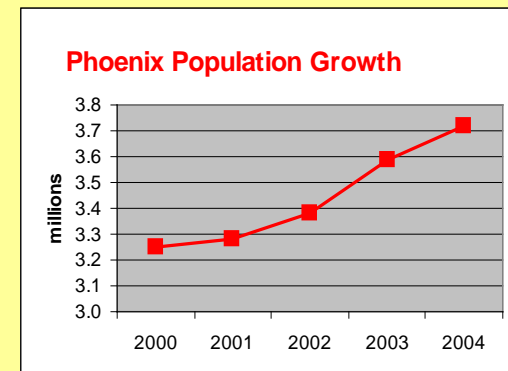
Global climate change



Annual rainfall variability



Urban heat island



Population growth

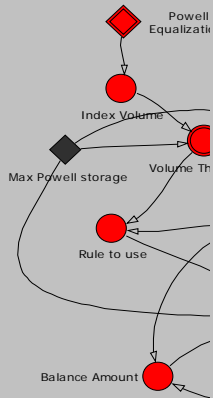


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“WaterSim” framework connects models for hydrology, law, economics, climate, land use

Lake Mead, Lake Powell, and the Seven States Plan



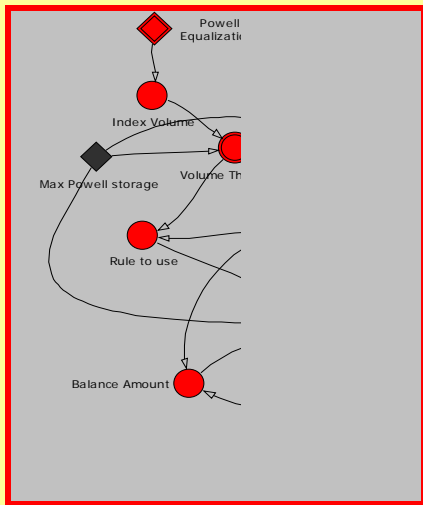
Lake Mead, Lake Powell and the Seven States Plan



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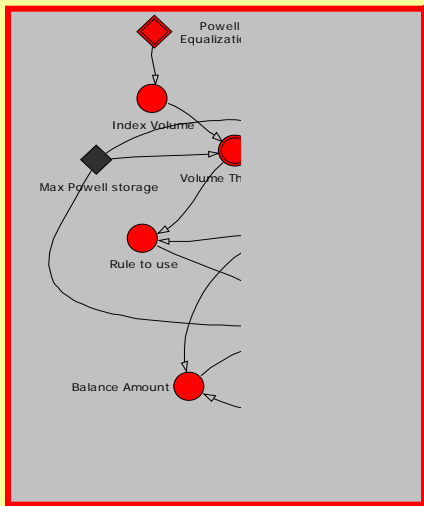


Lake Mead, Lake Powell, and the Seven States Plan

Lake Mead, Lake Powell and the Seven States Plan

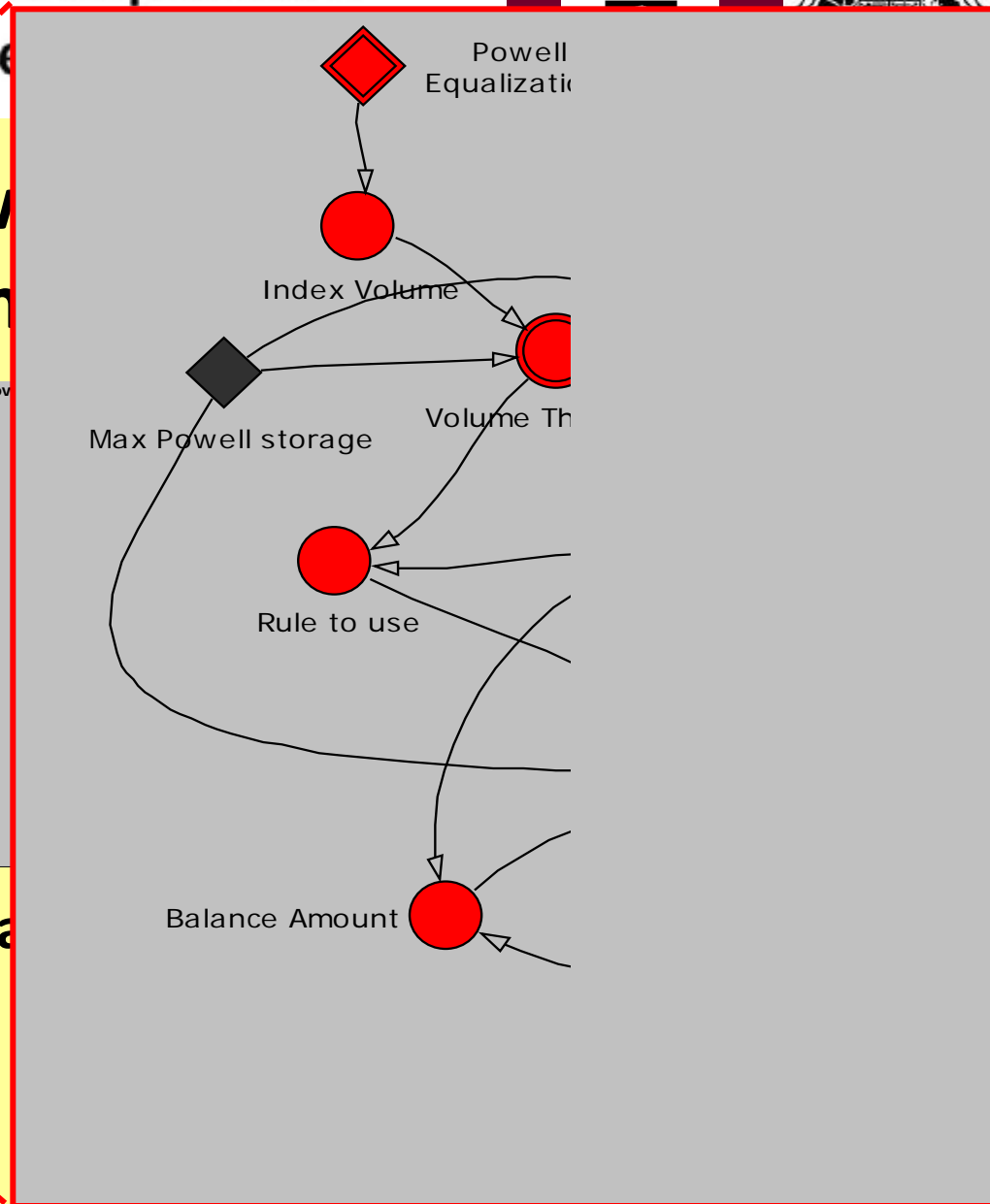


“WaterSim” framework hydrology, law, econ



Lake Mead, Lake Powell

Lake Mead, Lake Powell a





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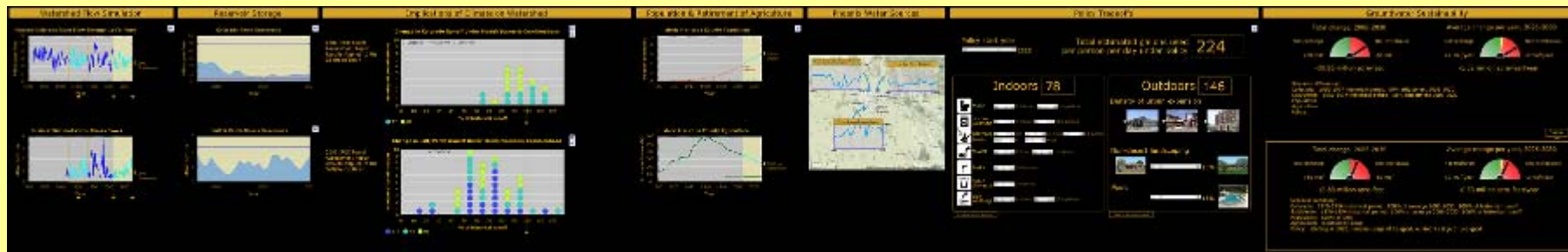
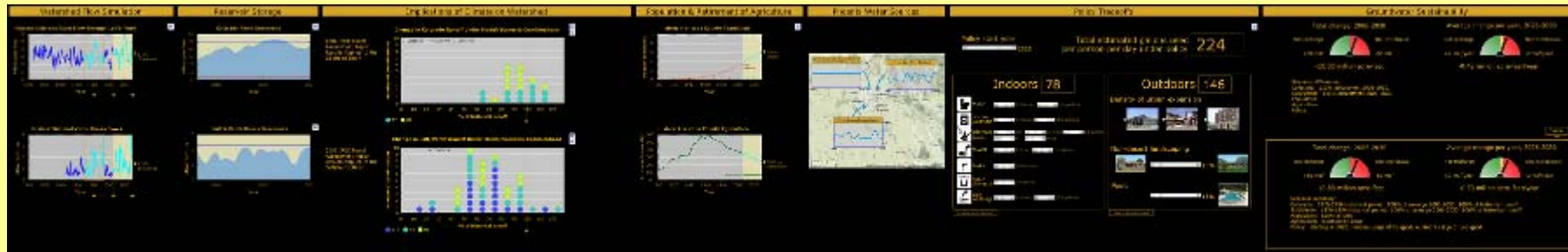
Using “WaterSim” tool in Decision Theater



WaterSim has many user-adjustable variables



The Comparative Genetics of Cities



Watershed
Simulation

Climate
Change

Land Use &
Population

Policy
Tradeoffs

Groundwater
Sustainability

More technical



Less Technical

Slider bars on graphs allow alternate futures to be assessed in real time

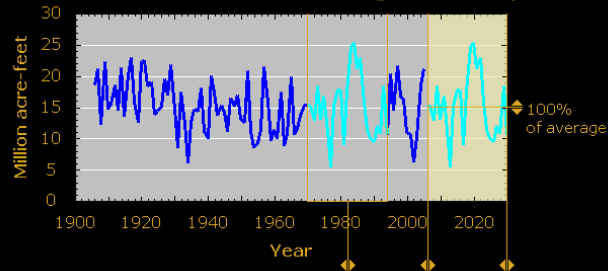
WaterSim also available online at <http://watersim.asu.edu>



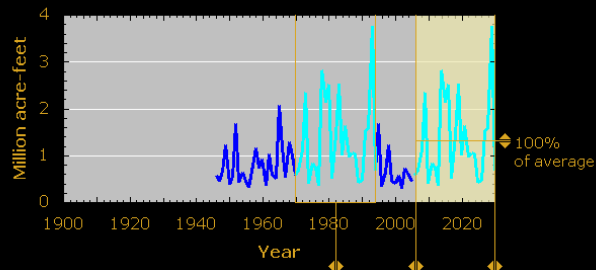
Watershed Simulation

Watershed Flow Simulation

Historic Colorado River Flow Through Lee's Ferry

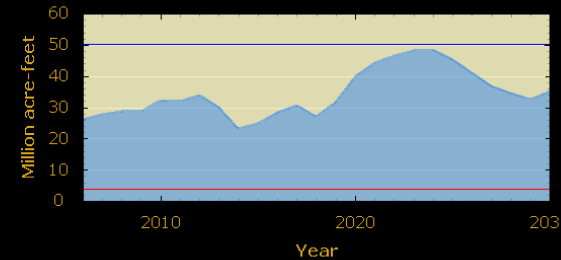


Historic Salt and Verde Rivers Flows

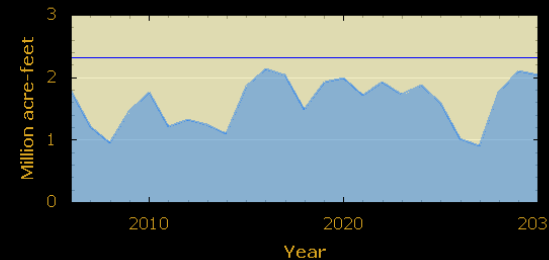


Reservoir Storage

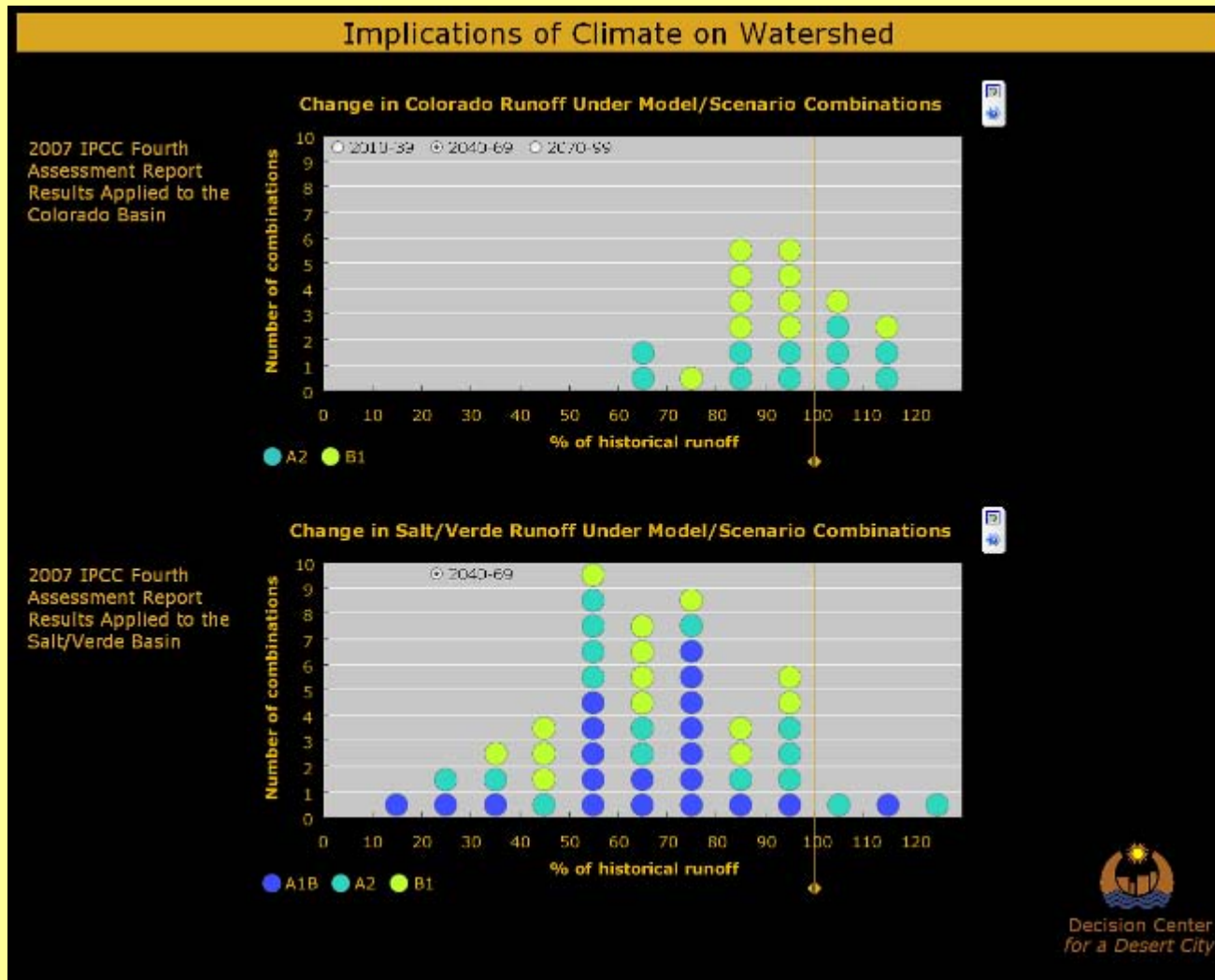
Colorado River Reservoirs



Salt & Verde Rivers Reservoirs

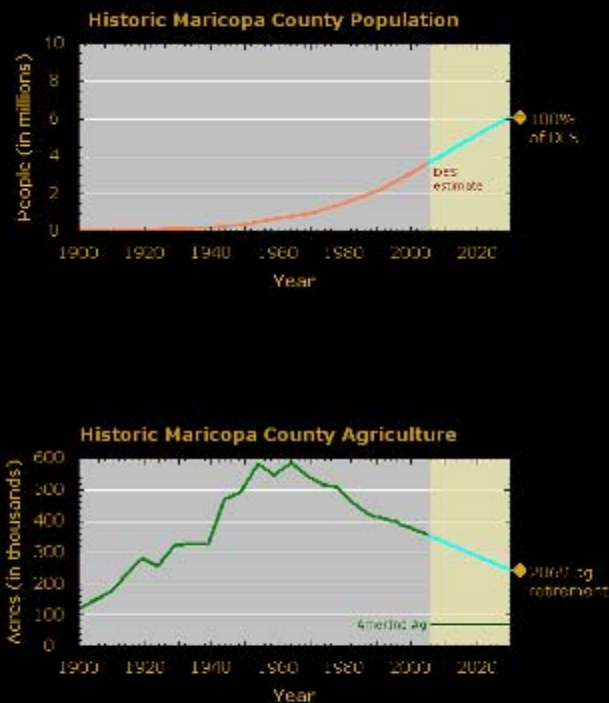


Climate Change



Land Use and Population

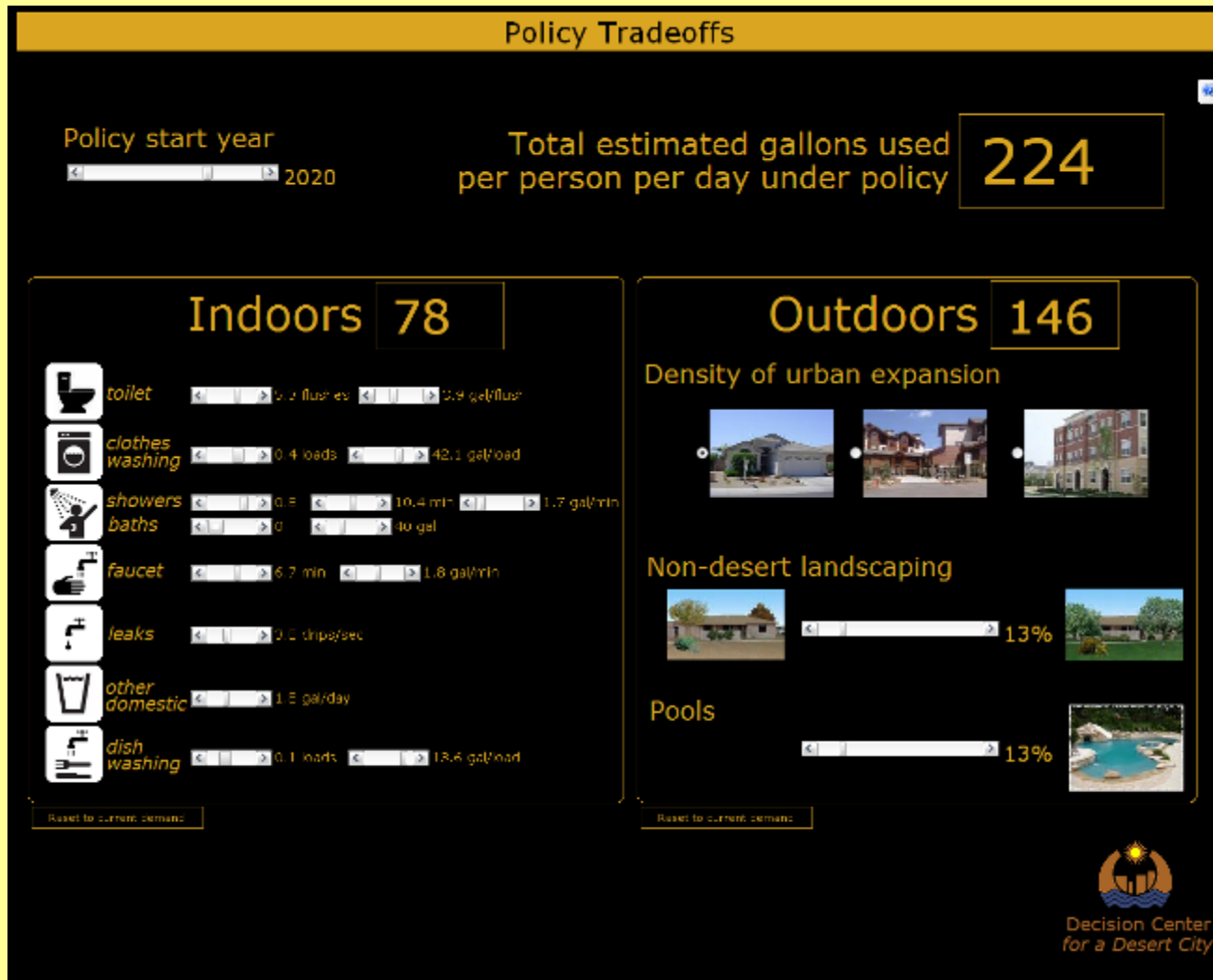
Population & Retirement of Agriculture



Phoenix Water Sources



Policy Tradeoffs

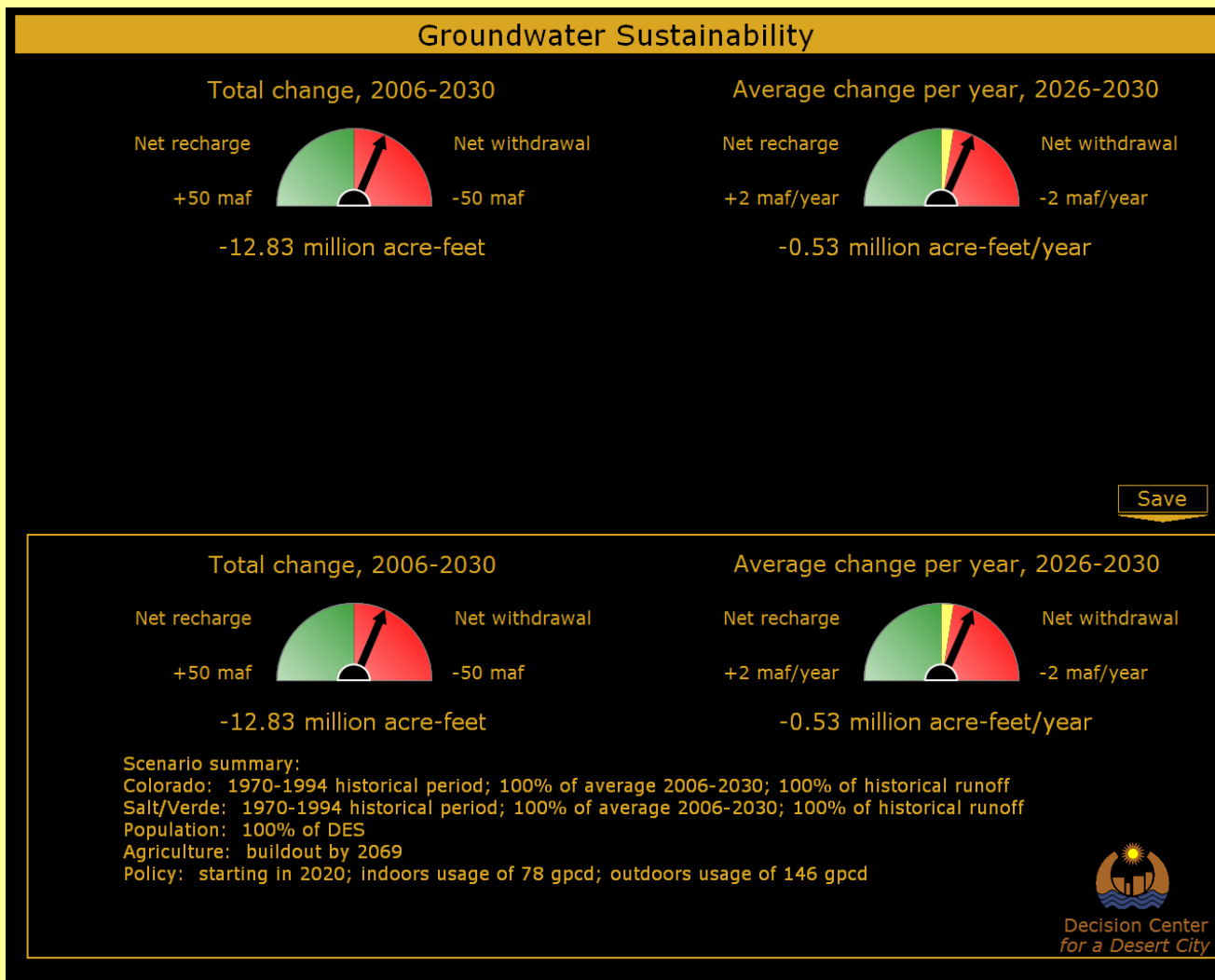




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Groundwater Sustainability



Lessons learned

- Stakeholder engagement an ongoing process
- DCDC helps managers communicate with their bosses
- Using WaterSim identifies critical gaps in observations
- Important to emphasize we don't predict the future
- Neutral convening role as important as modeling role

