



The Comparative
Genetics of Cities



Decision-making about water in Phoenix



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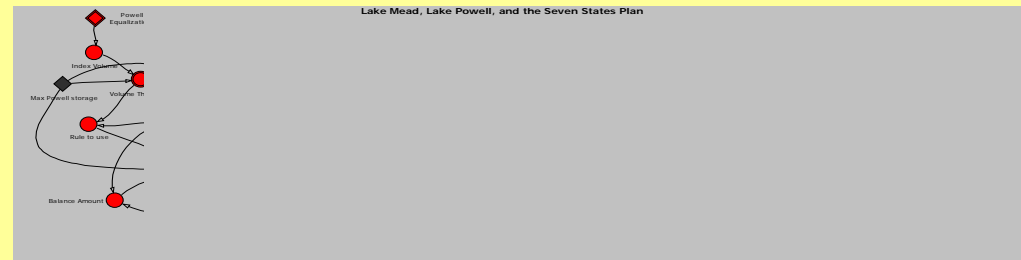


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Decision Center for a Desert City

- 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

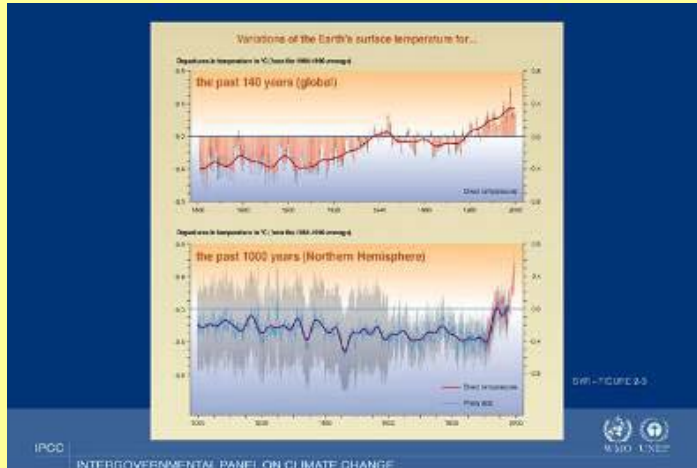




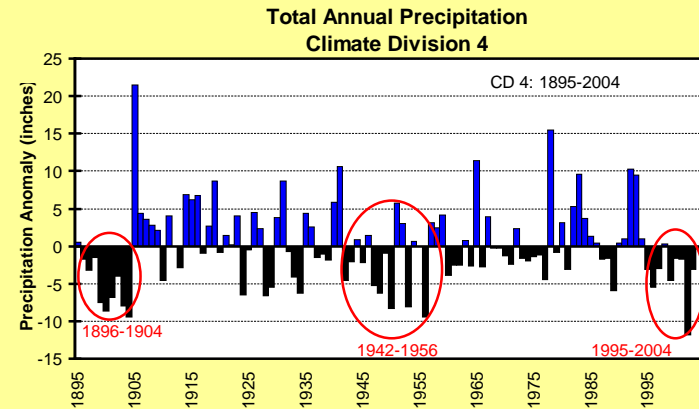
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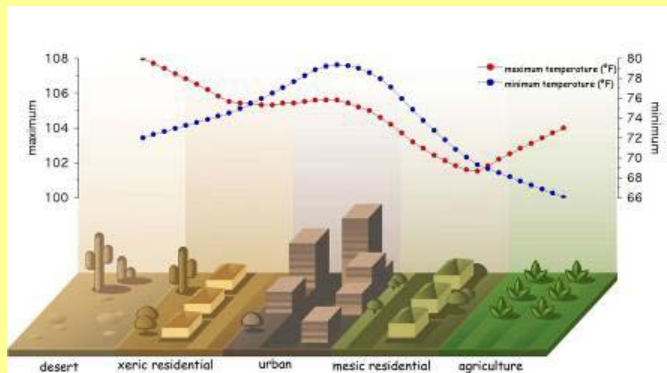
Sources of Phoenix's water uncertainty



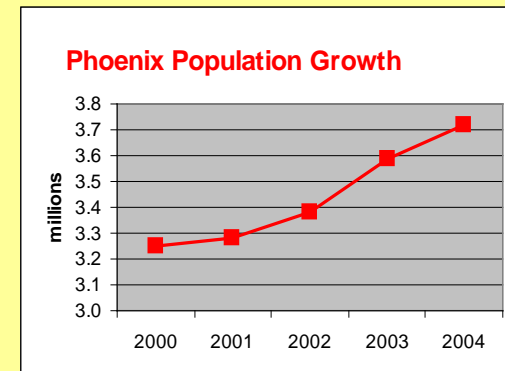
Global climate change



Annual rainfall variability



Urban heat island



Population growth

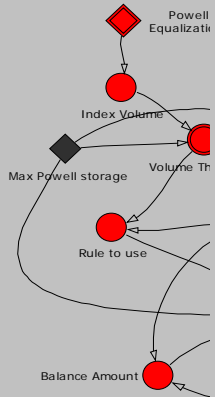


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“WaterSim” framework connects models for hydrology, law, economics, climate, land use

Lake Mead, Lake Powell, and the Seven States Plan



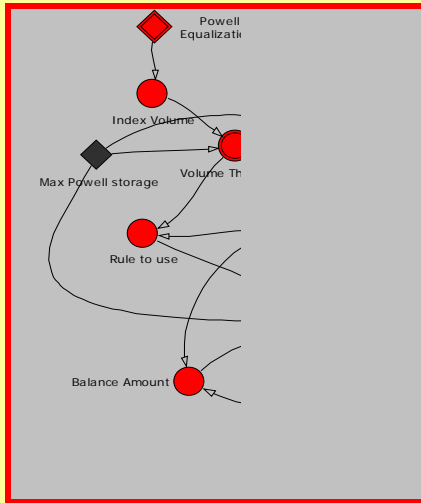
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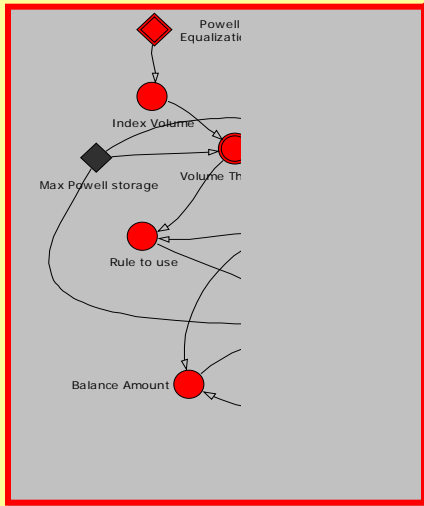


Lake Mead, Lake Powell, and the Seven States Plan

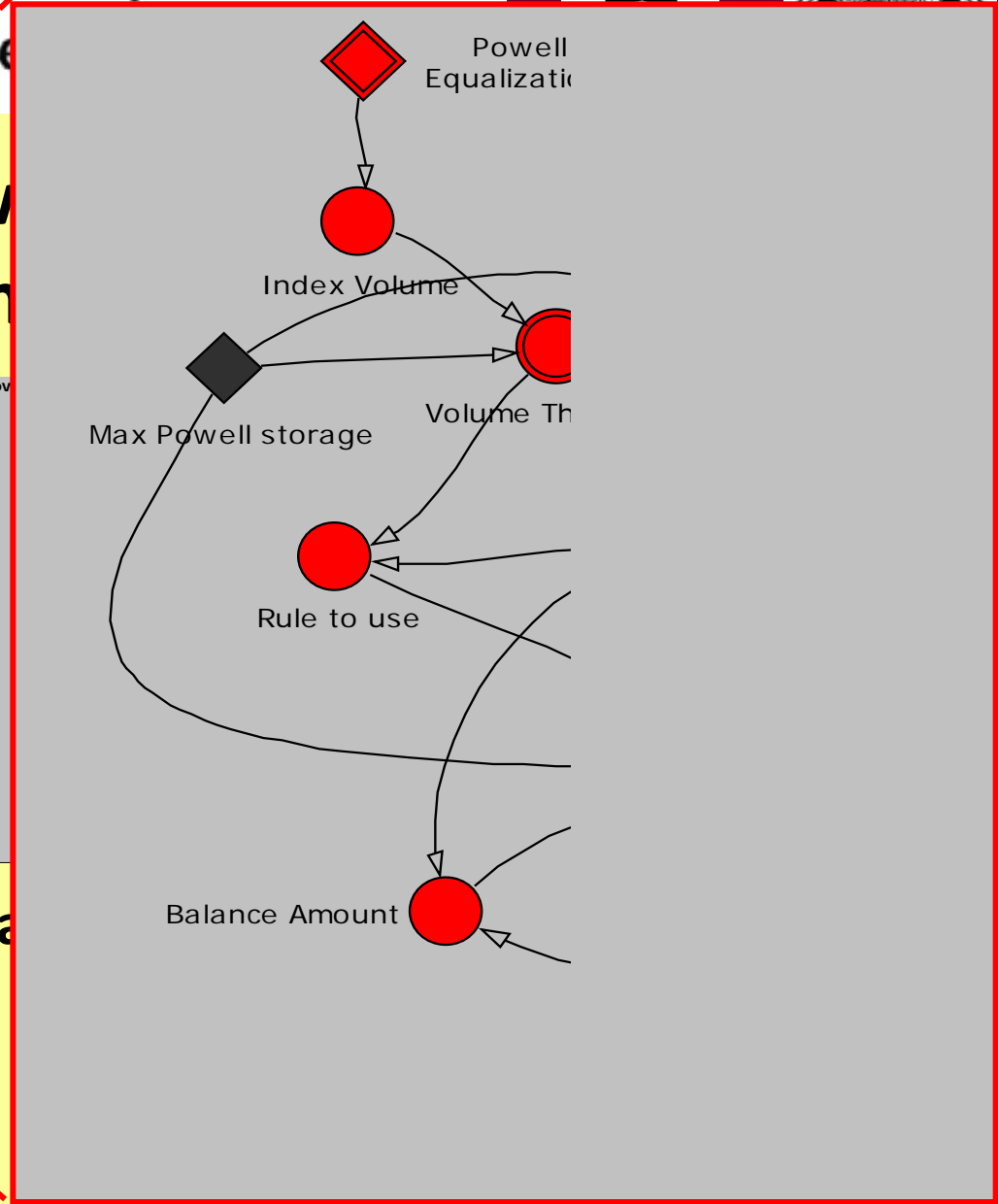
Lake Mead, Lake Powell and the Seven States Plan



“WaterSim” framework hydrology, law, econ



Lake Mead, Lake Powell



Lake Mead, Lake Powell a



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Using “WaterSim” tool in Decision Theater



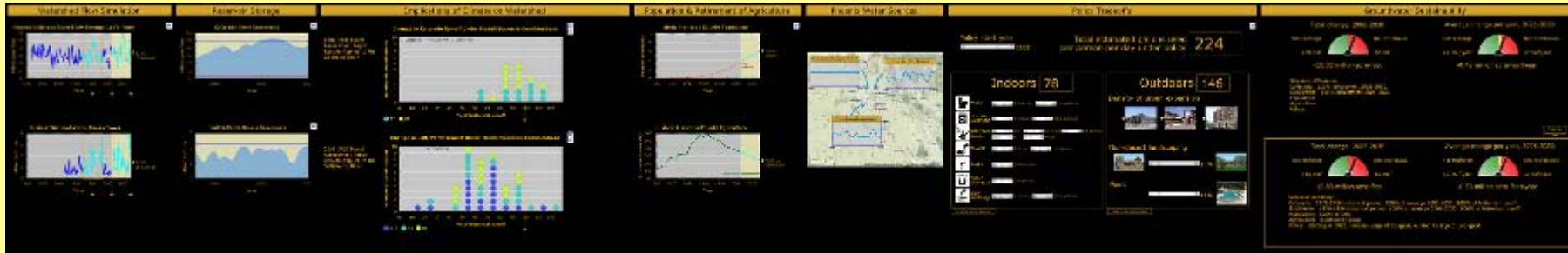
WaterSim has many user-adjustable variables



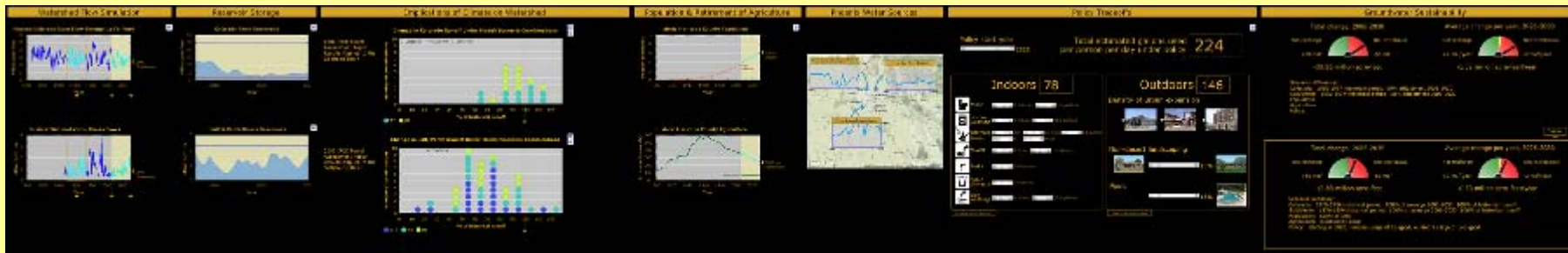
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Watershed
Simulation

Climate
Change

Land Use &
Population

Policy
Tradeoffs

Groundwater
Sustainability

More technical



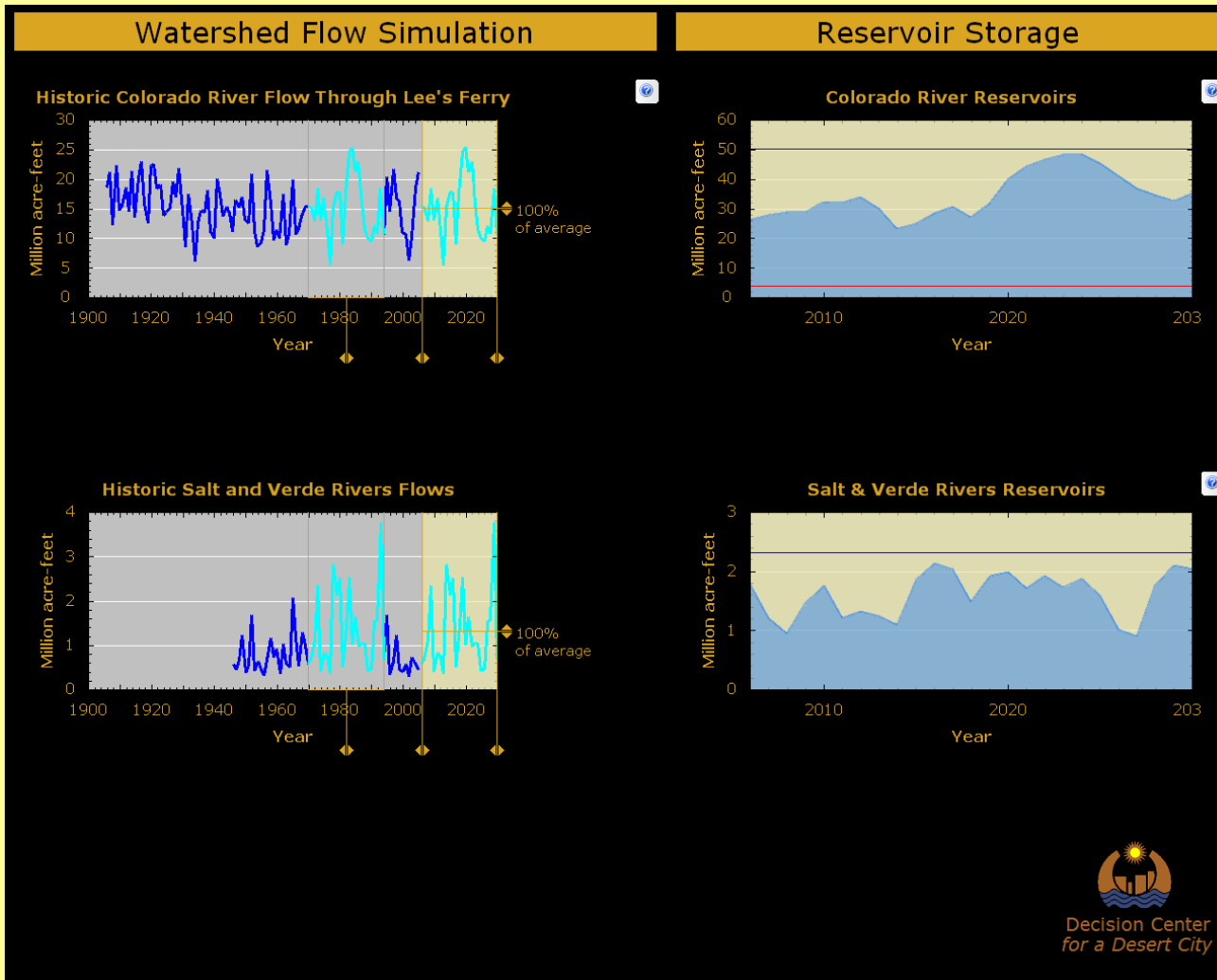
Less Technical

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

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

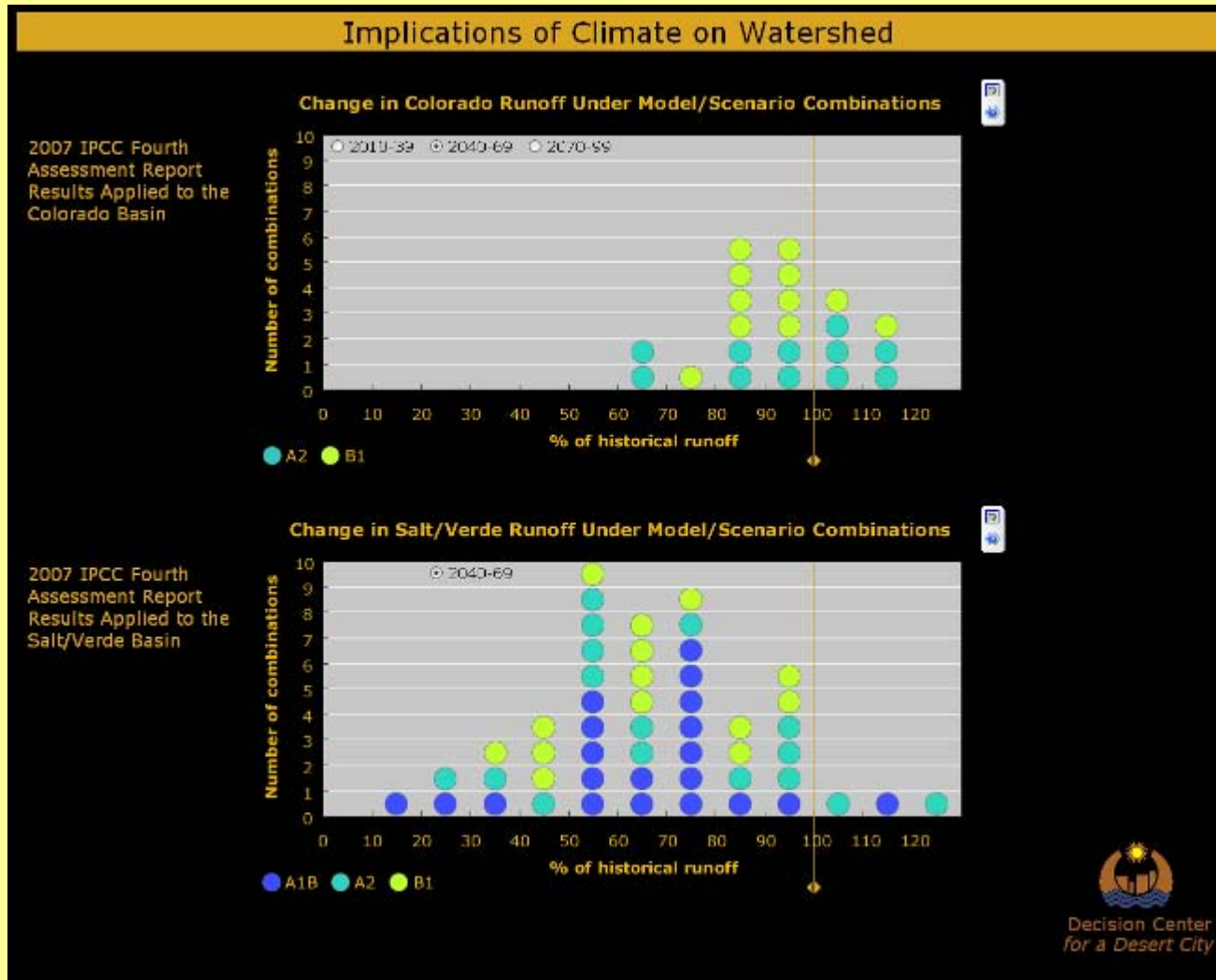


Watershed Simulation





Climate Change

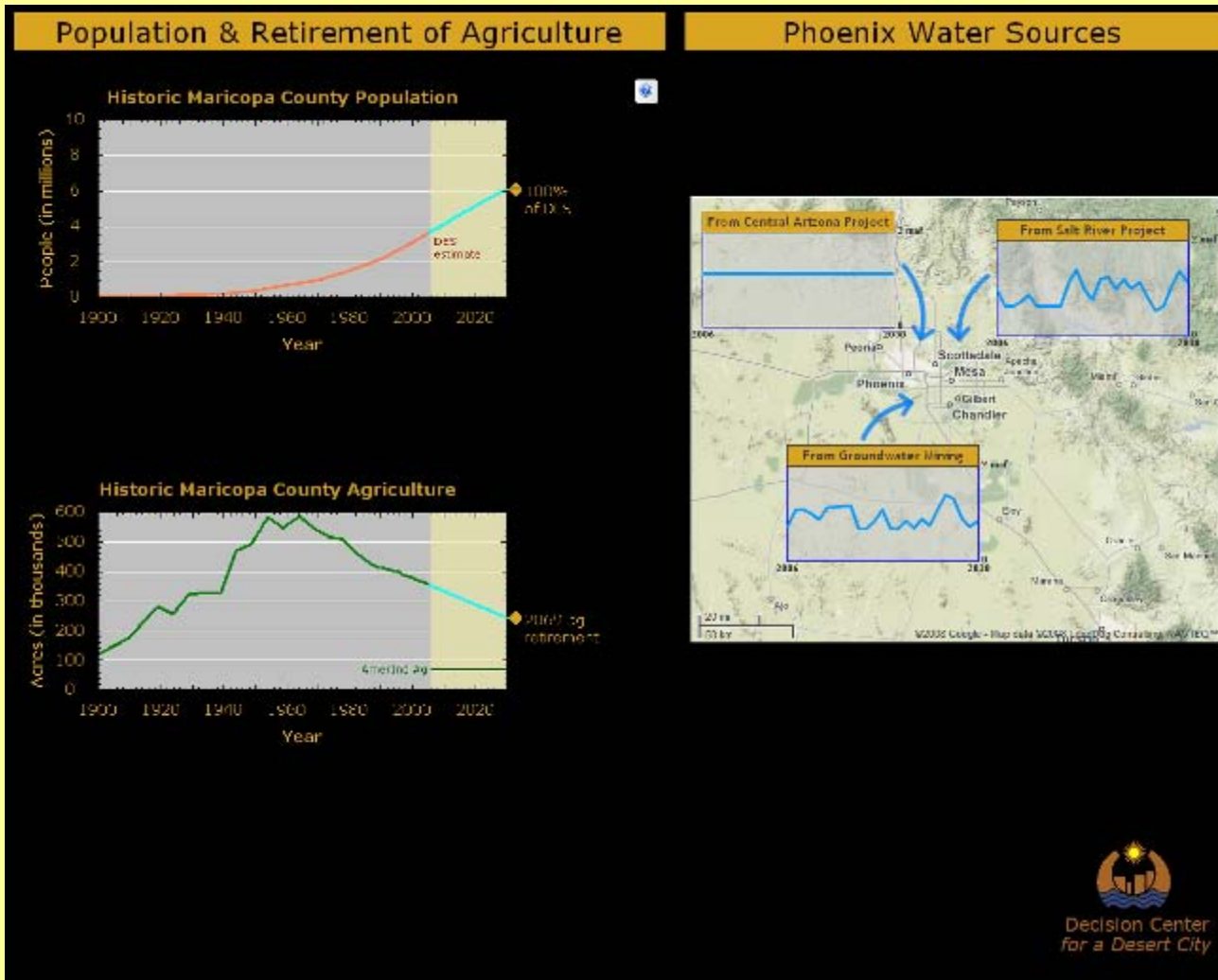




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Land Use and Population





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Policy Tradeoffs

Policy Tradeoffs

Policy start year: Total estimated gallons used per person per day under policy: **224**

Indoors **78**

- toilet* flushes gal/flush
- clothes washing* loads gal/load
- showers* min gal/min
- baths* gal
- faucet* min gal/min
- leaks* drips/sec
- other domestic* gal/day
- dish washing* loads gal/load

Reset to current demand

Outdoors **146**

Density of urban expansion

Non-desert landscaping

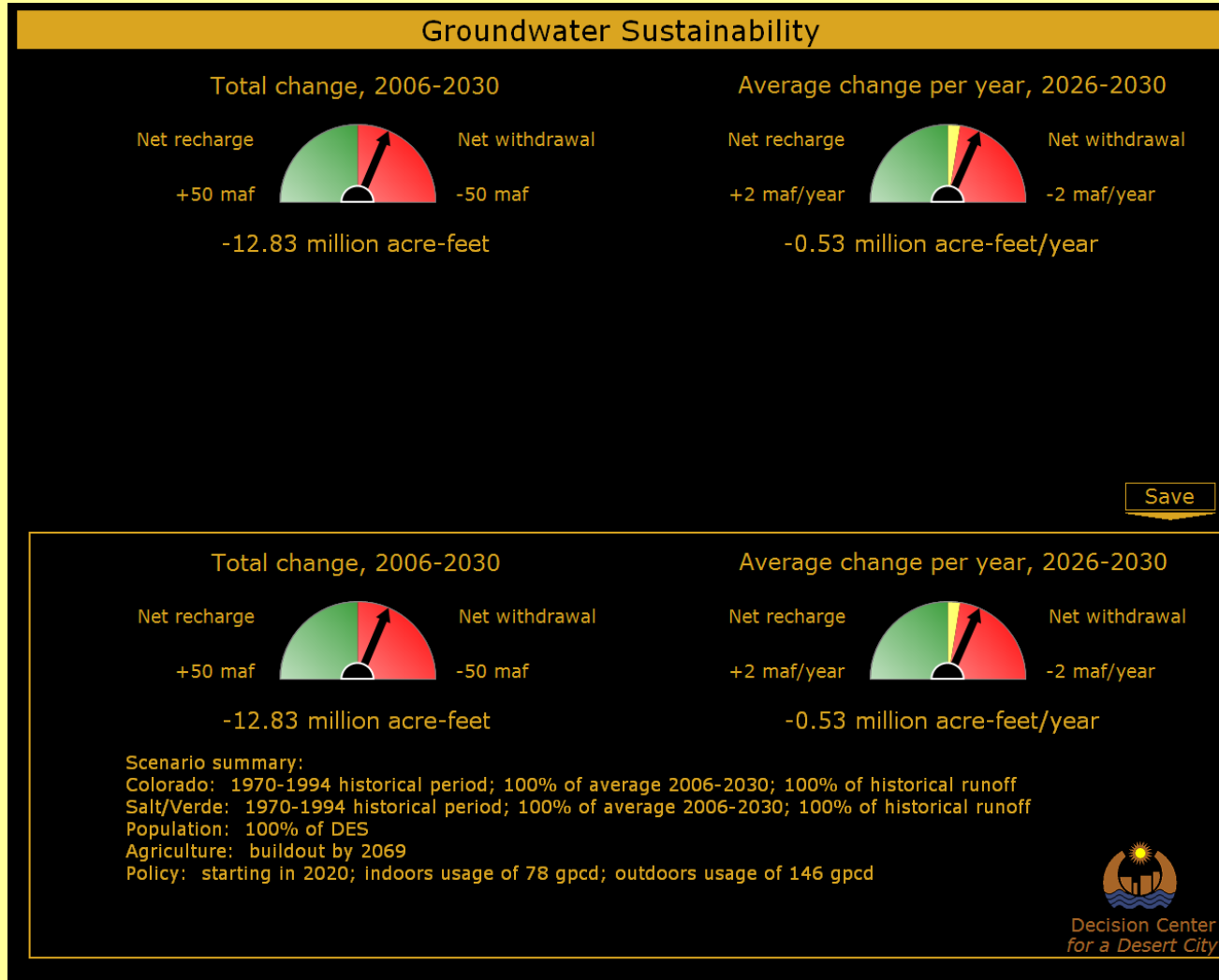
Pools

Reset to current demand

Decision Center
for a Desert City



Groundwater Sustainability





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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

