

A sustainable water supply for a sustainable future Mirage? Or Carpe Diem?

WRRC 2023 Annual Conference

What Can We Do? Solutions to Arizona's Water Challenges

12 July 2023

Tres English

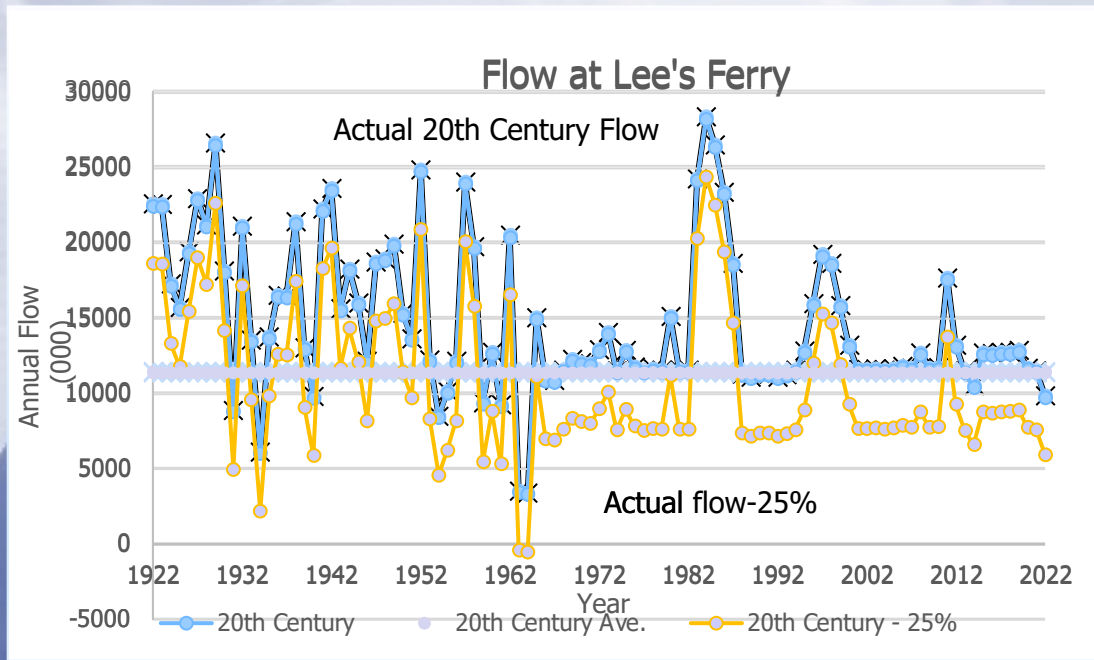


Tucson (“[Cuk Šon](#)”) has been continuously inhabited for over 4000 years – because the underground geography forces the underground Santa Cruz to the surface at Sentinel Peak.

The story of Tucson is the story of Water



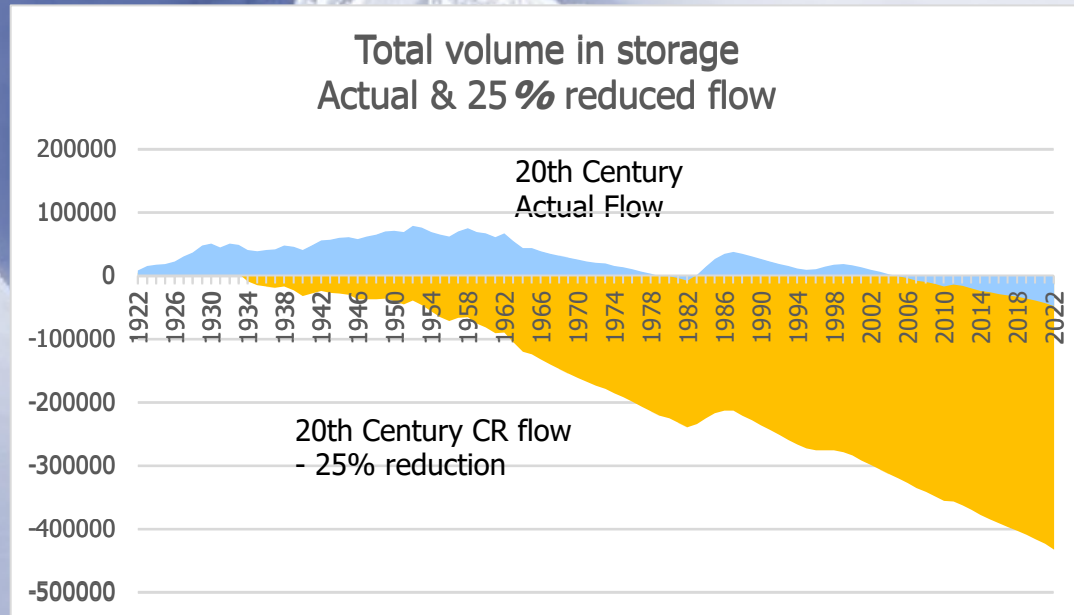
CAP has enabled Tucson to double in population in the last 40 years, and so has cut our per capita water use in half.



We will have a lot less water than we expect

Even if the precipitation does increase, our work indicates that there are likely to be drought periods as long as several decades when precipitation will still fall below normal.”

Jonathan Overpeck



We must plan for less water in the future, and sometimes a lot less.

CAP is NOT an “assured” water supply

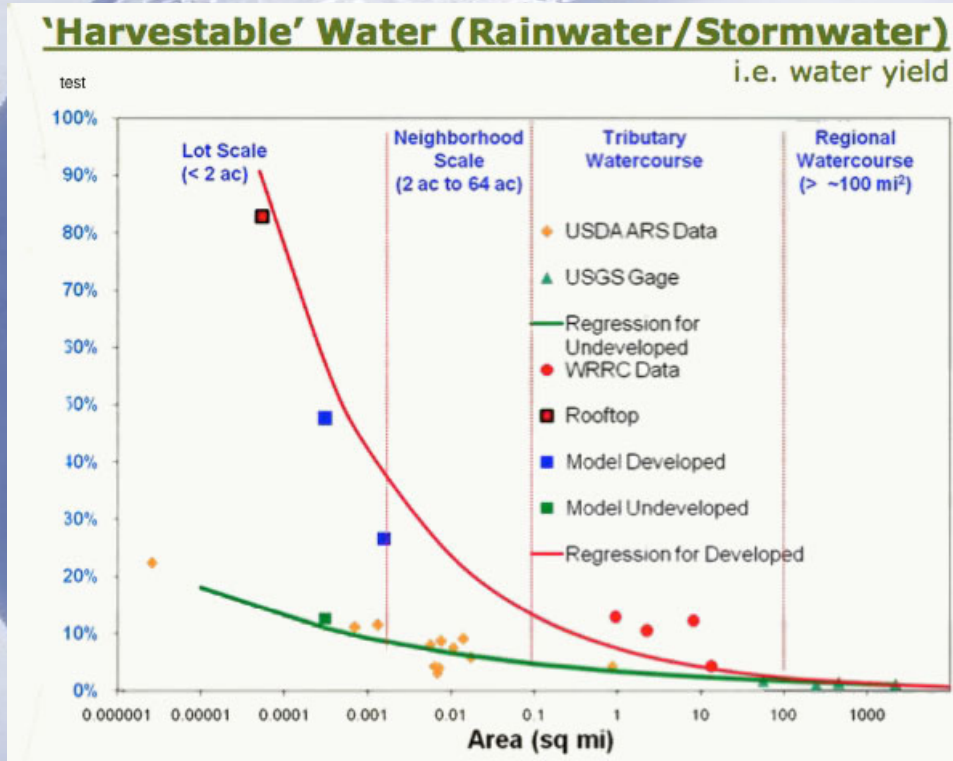
We have much more local water than we realize . . .

How much water?

Total rain	176,000AF
Harvestable rain (100K+ GSI)	60,000
Stored in drywells (10,000+)	15,000
Net Natural Recharge	40,000
<u>Maximum</u> potential	115,000AF
CAP (consumption)	100,000AF

How many trees?

Rainwatered street trees	850,000
Rain/Graywatered food trees	900,000
Total number of trees	1.75 million





A small watershed may harvest as much as 5x as much rain as a large regional watershed on a square-foot basis.

Runoff Coefficient $\approx 80\%$

*. . . But there's
a catch*



It is likely that many billions of gallons of currently wasted water can be captured and used by a million or more desert-adapted trees, but only if we capture and use it right where it falls.

Runoff coefficient $\approx 15\%$

It's time to set priorities for water

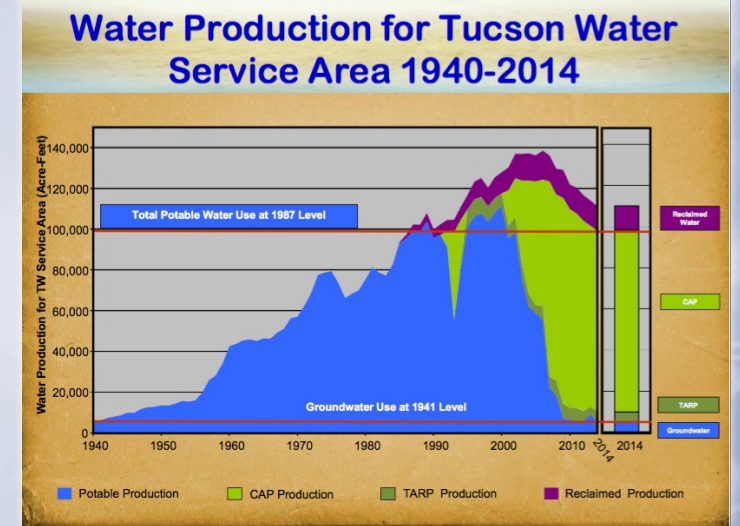
Waste – Using something of high value to achieve something of low value.



Toilets use $\frac{1}{4}$ of indoor household water



Decorative landscaping uses 40% of residential water



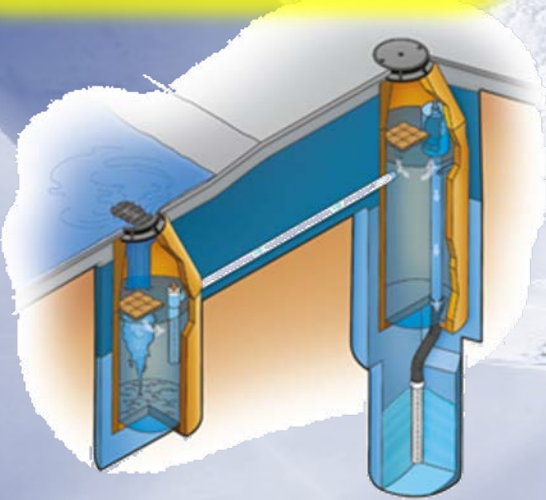
Tucson has half as much water per person as 1980, because we have given away the water we have to 2nd city

... Or we can make our neighborhoods beautiful, safe, shaded, and fun

Street trees	2500
Food trees	2800
Chicanes	64
Circles	49
Parklettes	5

How Many Trees
in a residential
Square Mile?

10,000+ Drywells
Store 15,000AF



Make Tucson a city of parks, shaded
by a ran- & gray-watered food forest



Trees,
Trees,
Trees

Tucson has 3-4 days of food



This “City of Gastronomy” can guarantee a secure food supply for 1 million people using just our rain.

So - What would Tucson be like, if we have millions of rain- & gray-watered food trees shading all Tucson and turning our neighborhoods into parks?

Neighborhoods can



Build Resilience by Building Community

Tucsonans drive 10 billion miles a year and are \$15 billion short of our costs.



The first step determines it all. A beautiful, safe, shaded neighborhood is the first step to a Mobility Diet and a *reduction* in total driving and roads.

Tucson can become sustainable with our renewable water supply. But the end of fossil fuels will force cities of the 21st Century to become major primary resource producers of food, water, and energy (among other things).



Our best course is to sell off CAP to the SNWA for a \$1 Billion, and use it to make Tucson a world leader in water efficiency and desert-adapted technologies (while they are still stupid enough to pay us for our paper water rights)