



**Water Resources  
Research Center**



**THE UNIVERSITY  
OF ARIZONA**

## OPTIONS FOR MEETING ARIZONA'S FUTURE WATER NEEDS IN THE CONTEXT OF COLORADO RIVER WATER MANAGEMENT



**Central Arizona Project**

**WATEC 2011  
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Tel Aviv, Israel**

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**Photo Credit – Bryce Megdal**

## Comparative Israeli and Arizona Water Policy and Management

Partnership Opportunity

- Deep interest since before a 2006 visit
- Workshop in Tucson, 2009
- Have been here several times since then visiting water works, agricultural facilities, and restoration sites and interacting with colleagues
- Visiting Professorship at The Hebrew University, March 2012
- Value in sharing lessons learned and identifying best practices



**Newsletter from 2009 workshop**



**Abraham and Nechama Tenne, Yuma, AZ 2011**



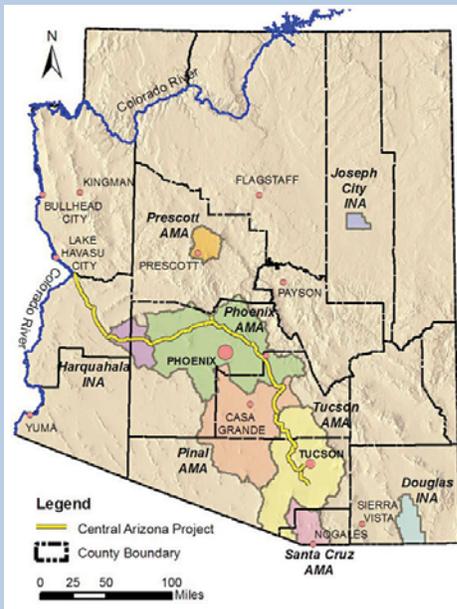
## Arizona Snapshot

- Population of 6.5 million people expected to almost double by 2050.
- Water use estimated to be about 7 Million Acre Feet (MAF) (8,634 Million Cubic Meters (MCM))
  - Approx. 40% of total use is groundwater
  - Approx. 3% is recycled or reclaimed water
  - Of the remaining use, which is surface water, 2.8 MAF (3,453 MCM) is from the Colorado River (40 % of the total)
    - 1.5 MAF (1,850 MCM) of that is delivered through the Central Arizona Project
- Approx. 70% of water diverted or extracted by agriculture, which has very senior rights to use water



## Decentralized water management

- Water is publicly owned; use is determined by system of water rights
- Surface water rights – first in time, first in right
- Since 1980, groundwater use is regulated in the Active Management Areas (AMAs)
- In the AMAs conservation and demonstrations of assured water supply for municipal development are required; outside AMAs little regulation
- Agriculture expansion limited in AMAs and a few other areas
- Indian Nations control their own water supplies



CAP Canal



Effluent in Santa Cruz River

## Some Challenges

- Water scarcity relative to growing demands
- Growth does not necessarily occur where water resources are
  - Infrastructure needs and financial constraints
- No state water plan
- Climate variability/change => more uncertainty, particularly when it comes to the Colorado River
  - Region predicted to get hotter and probably drier, too
  - Central Arizona Project's low priority
- Groundwater law provisions allow pumping to 1,000 feet (305 meters) below land surface
- Limited recognition of surface water-groundwater connection
- Environmental water needs (water for nature) largely not considered
- Water-energy dynamic relationship
- Increasing salinity and other water quality issues
- Increasing water reuse
- Lack of regulations...Other



## Options for Addressing Challenges

- Conservation programs, including tiered pricing
- Desalination – Brackish and seawater?
- More reuse of treated wastewater
  - Matching the water type with the quality needed
  - For potable purposes?
- Rainwater harvesting – questions of scale
- Water banking, within state and interstate
- Colorado River Shortage Sharing
- Water transactions/transfers – not as much in Arizona as in some other states

But...

No scarcity component to prices

Groundwater mining will continue

Not clear if the water acquisition strategies being contemplated can be accomplished, as they require voluntary arrangements.

Will water run uphill to money?

The water glass is half full but, long-term, have to worry about the empty part.



Yuma Desalting Plant



### Similarities

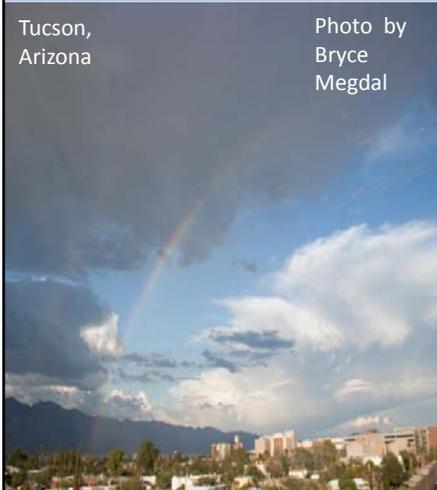
### Recharge, Recovery and Reuse

By the Shafdan Recharge Facility

## More Similarities

Tucson,  
Arizona

Photo by  
Bryce  
Megdal



Agamon-Hula KKL-JNF Site, Israel 14Nov2011



## But an important difference



Photo taken 16 March 2011 6:45

Thank you! [smegdal@cals.arizona.edu](mailto:smegdal@cals.arizona.edu)  
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