



Advances in Inland Desalination

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W. Shane Walker, Director
Malynda Cappelle, Associate Director
UTEP Center for Inland Desalination Systems



Center for Inland Desalination Systems

- Formed in 2009
 - \$2M – State of Texas ETF
 - \$2M – UT/UTEP system
 - >\$5M – Outside funds
- Director: W. Shane Walker
- Focus of Research:
 - Brackish desal to maximize GW utilization – especially concentrate management
 - Technology Development & Commercialization
 - Education – classroom, laboratory, field

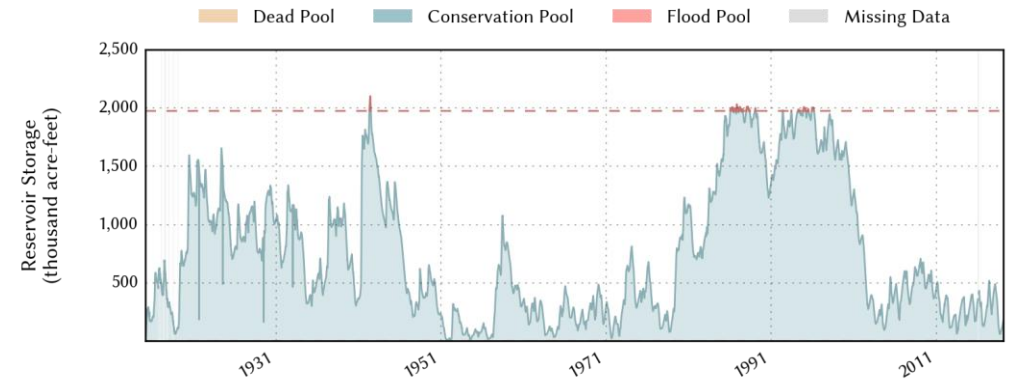


What if we could peer into the future a bit?

- Climatologists (e.g., Gutzler et al, UNM) have downscaled a portfolio of many global climate change models for the southwestern U.S., and most of the **models project hotter and drier climate**.
- If this “majority report” is correct, then over the next few decades, we expect to see **less snowpack and surface runoff**, and consequently, more lakes continue to dry up (e.g., Elephant Butte, Mead).
- Meanwhile, there is a general trend of **population growth and urbanization**.

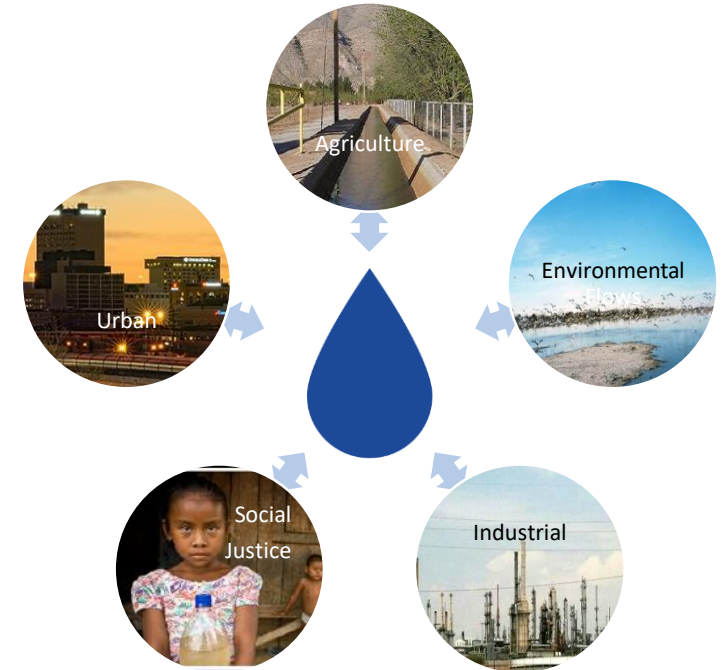
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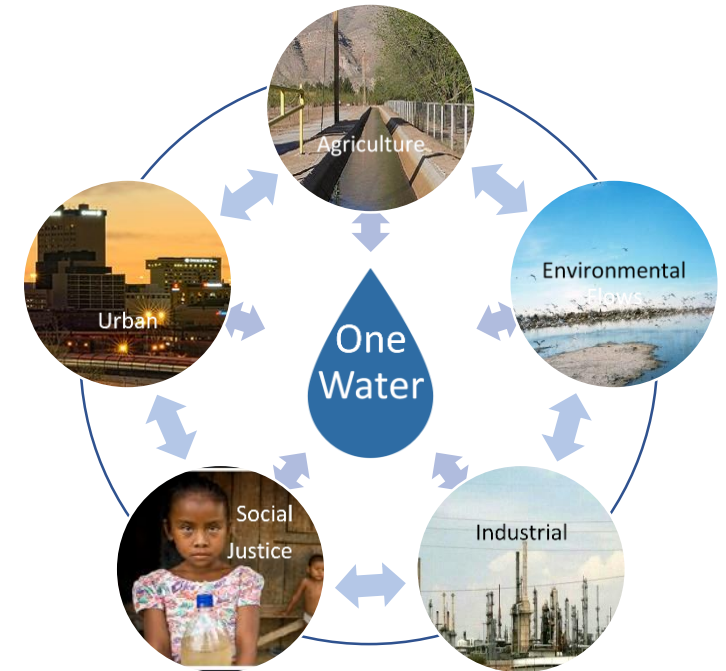
Exacerbating challenges in semi-arid regions

- Changing climate & competing demands
- Growing population, urban, & indust. demand
- Inequitable distribution & cost of water
- Agriculture uses majority of water; dwindling groundwater
- Lack of environmental flows
- Increasing salinity



What are we going to do about it?

- Hopefully, most communities will proactively pursue sustainability and resilience.
- We need a holistic and integrated “One Water” initiative.

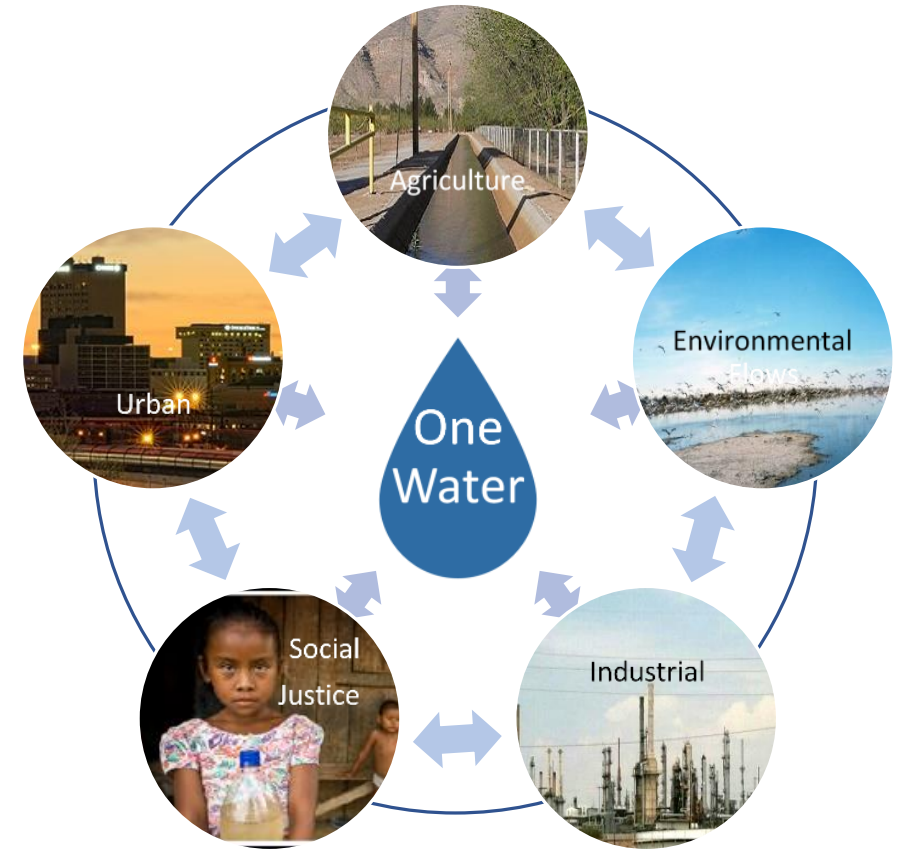


One Water Paradigm

- We consider all sources of water as part of **one** limited supply (precipitation, wastewater, gray water, return flows, recharge, etc.) and optimize the processes of recycling and reuse.
- We manage surface and groundwater as **one** through conjunctive water use approaches.
- We share **one** water among several important sectors of users: agriculture, urban, industrial, environmental, and rural residents who lack adequate access to water.
- We share **one** water across boundaries among multiple countries, states, and cities.

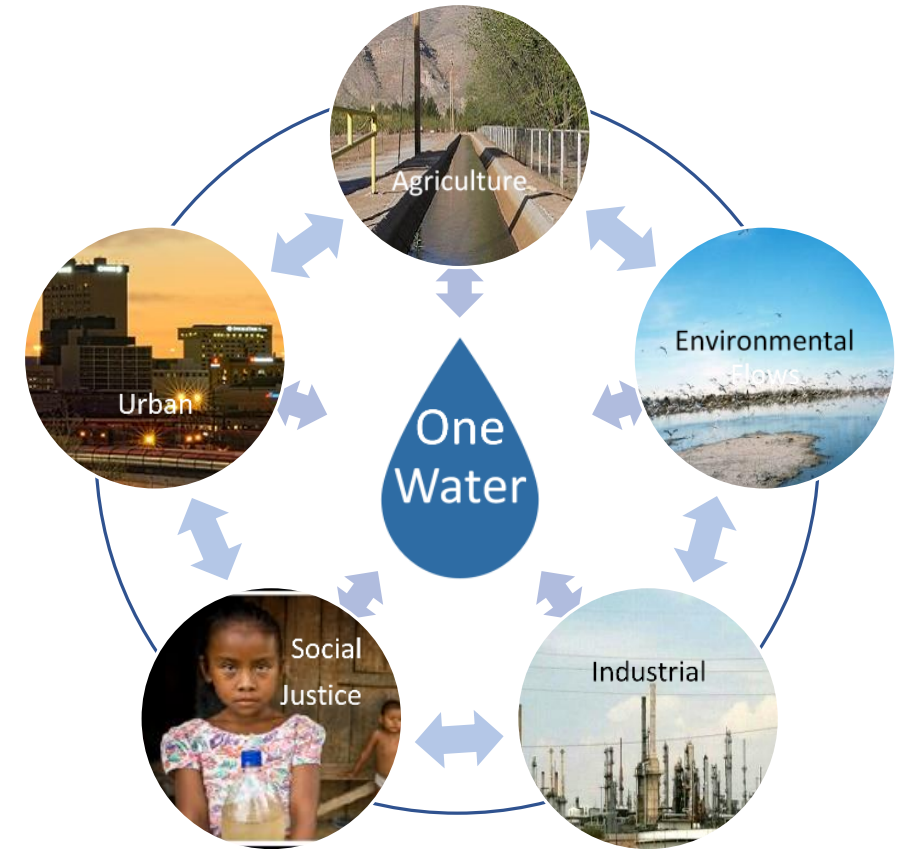
One Water Initiative

- Transform water sustainability and resilience in semi-arid regions around the world by forging innovative One Water strategies and practical approaches for all uses
- “sustainable water”: adequate, affordable, acceptable, usable, safe, clean

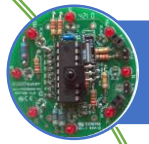


One Water Objectives

- **Catalyze** societal capacity to innovate and adapt flexibly to an uncertain water future
- **Transform** water infrastructure in cities to provide the best quality water for the highest use
- **Empower** rural and developing communities for a water-secure future
- **Re-envision** conventional agriculture as food, energy, and water smart systems
- **Re-imagine** river systems to restore environmental flows and services



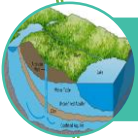
Part of the solution: Technology Development



Smart Treatment Systems



Use Impaired Water



Aquifer Storage & Recovery



Desalination & Reuse For Agriculture & Food Security



Integrating Renewable Energy



Enhanced Evaporation & Byproduct Recovery

Current & Future Projects

- USDA NIFA – Rio Grande Water Sustainability Center
<https://water.cybershare.utep.edu/>



- NSF ERC - Nano-Enabled Water Treatment (NEWT)
<http://www.newtcenter.org/>



- Piloting high-recovery ZLD DPR in El Paso, solar-powered high-recovery desal at BGNDRF



Invitation to Collaborate

W. Shane Walker, Ph.D., P.E.

Director, Center for Inland Desalination Systems

Assoc. Prof., Civil Engineering

wswalker2@utep.edu

915-747-8729

