

Wastewater Happens!

Current Uses and Future Trends in Water Reuse

Presented at:

**Cleantechnology & Sustainable Industries Summit
Water Supply, Efficient Use & Water-Energy Dependence**

**Washington, DC
October 31, 2007**



Presented by:

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WaterReuse Foundation**

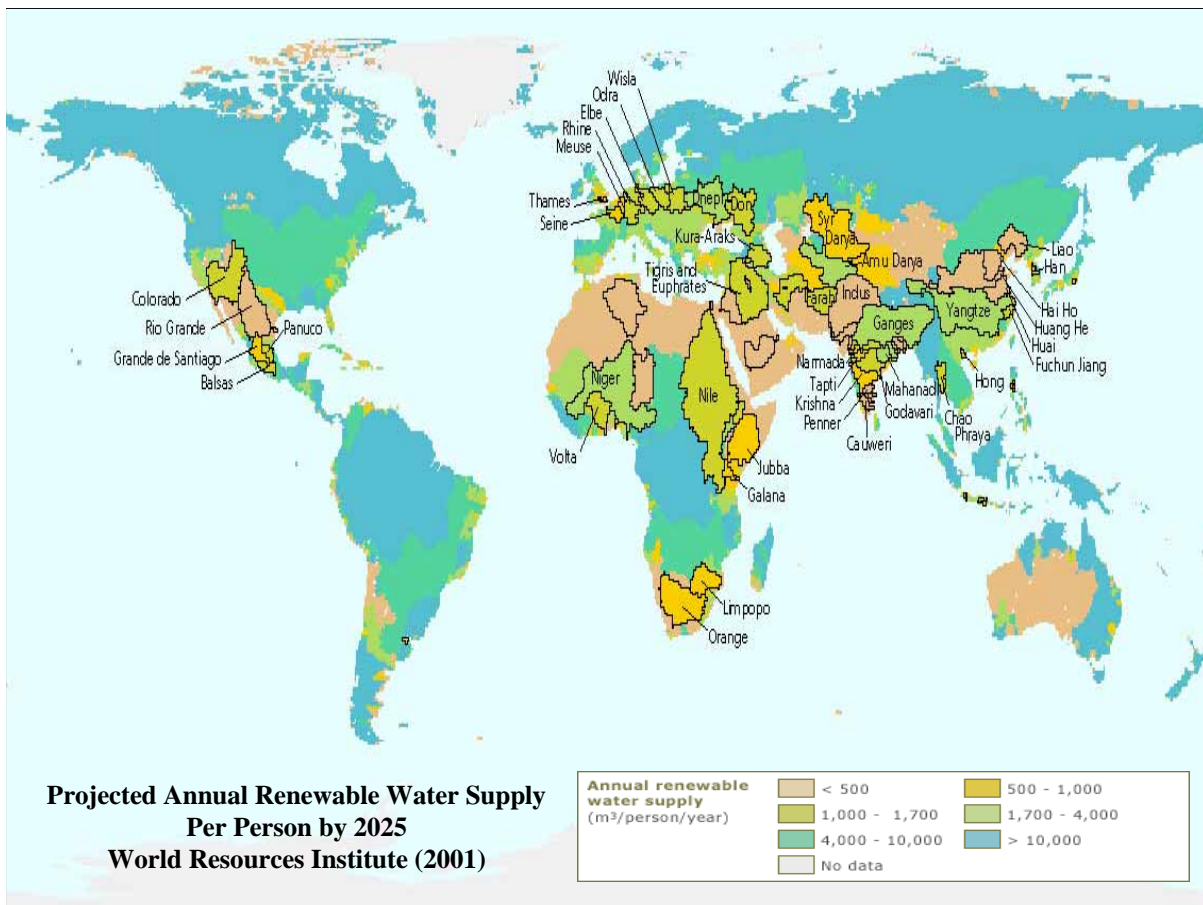


Overview

- Supply and Demand Realities
- Available Options to Water Scarcity
- Status and Potential of Reuse & Desal
- Issues, Barriers, Impediments
- WaterReuse Association/Foundation
- Summary & Conclusions



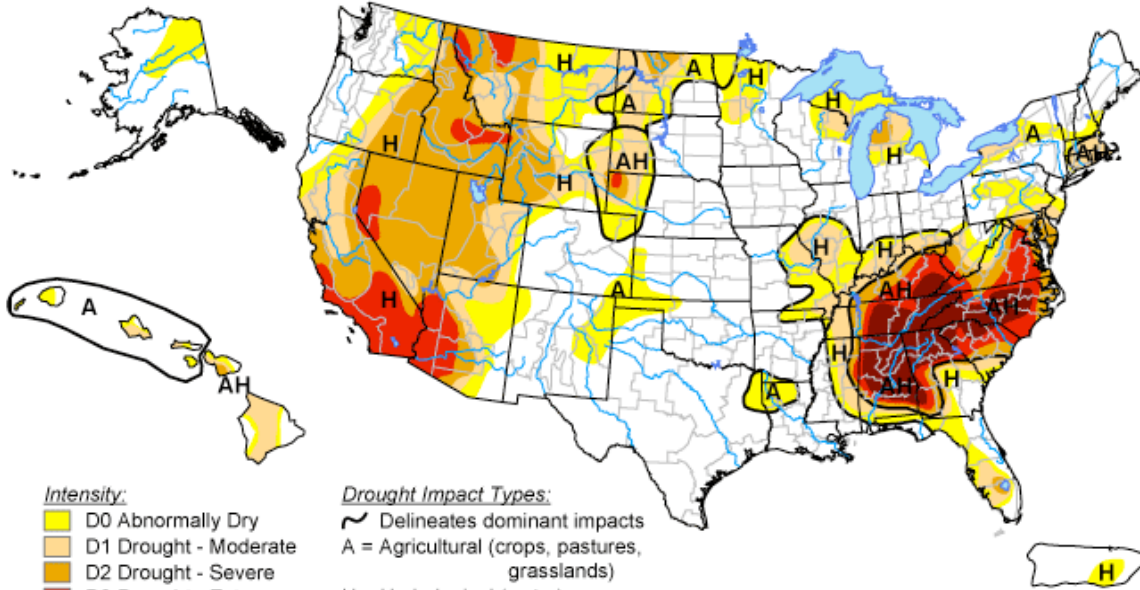
“Scary Water!”



U.S. Drought Monitor

October 23, 2007

Valid 8 a.m. EDT



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

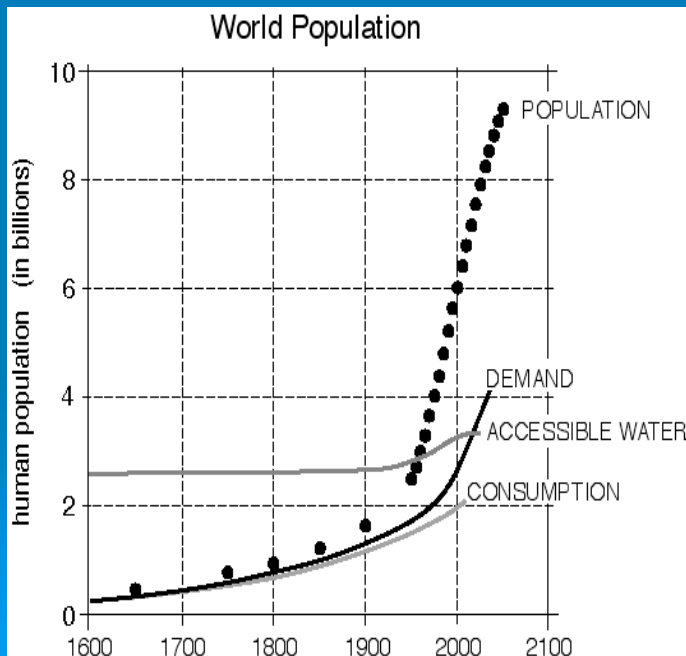
<http://drought.unl.edu/dm>



Released Thursday, October 25, 2007

Author: Mark Svoboda, National Drought Mitigation Center

Supply & Demand



Demand for water will surpass accessible water by 2014 (at around 10,000 cubic km/yr).

Actual consumption is lower than demand because water sources may be inaccessible to population centers. Consumption will be forced to level off by 2030 due to limits on accessible water.

source: R.P. Ambroggi
graphic: Joel Pomerantz

Available Options to Water Scarcity

- Conservation
- Purchase water and water transfers
- Tapping non-traditional sources:
 - Water reuse
 - Desalination (seawater & brackish groundwater)



Water Reuse

- “The Reclamation and Treatment of Impaired Waters for the Purpose of Beneficial Reuse”
- Impaired waters include:
 - Municipal and industrial wastewater effluent
 - Brackish water
 - Poor quality ground water
 - Agriculture return flows
 - Stormwater
 - Oceans



Water Reuse Objectives

- Create “new” water supply to overcome pending shortages due to:
 - population growth
 - increased municipal, industrial, and agricultural demand
 - drought
- Conserve potable water supplies



Benefits of Water Reuse

- Provides a local, dependable water supply
- Economically attractive
- Reduces wastewater discharges to surface waters
- Reduces uses of imported water
- Conserve potable supply



Status of Water Reuse in the U.S.

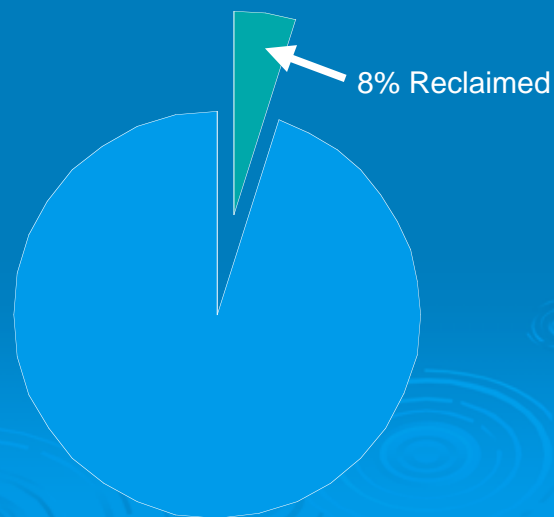
- “Long-established practice in the U.S.”
- > 2 bgd recycled nationwide
- Over 1,600 water reuse facilities in U.S.
- Approximately 90% of Water Reuse Occurs in 8 States



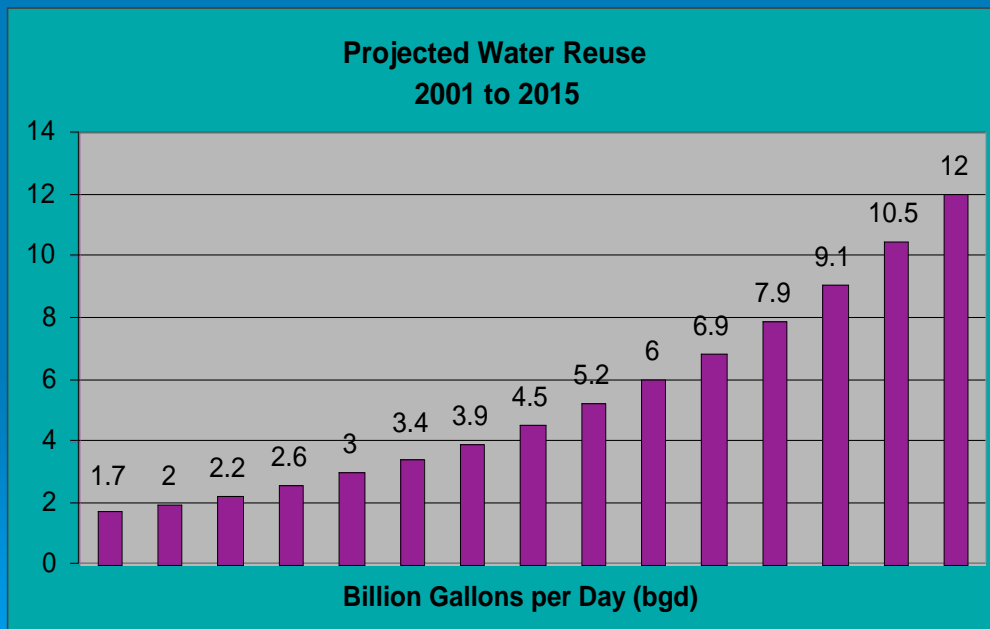
Potential for Water Reuse

About 35 bgd Municipal Effluent in the U.S.

“I Believe the Last River for Us to Tap is Wastewater” - John Keys



Projected Growth in Water Reuse



Status & Potential of Desalination

- >17,000 Desalting Units Globally with Capacity >10 bgd
- Installed Capacity Doubled Between 1994-2005
 - Expected to Double Again by 2015
- Brackish Groundwater Has Great Potential

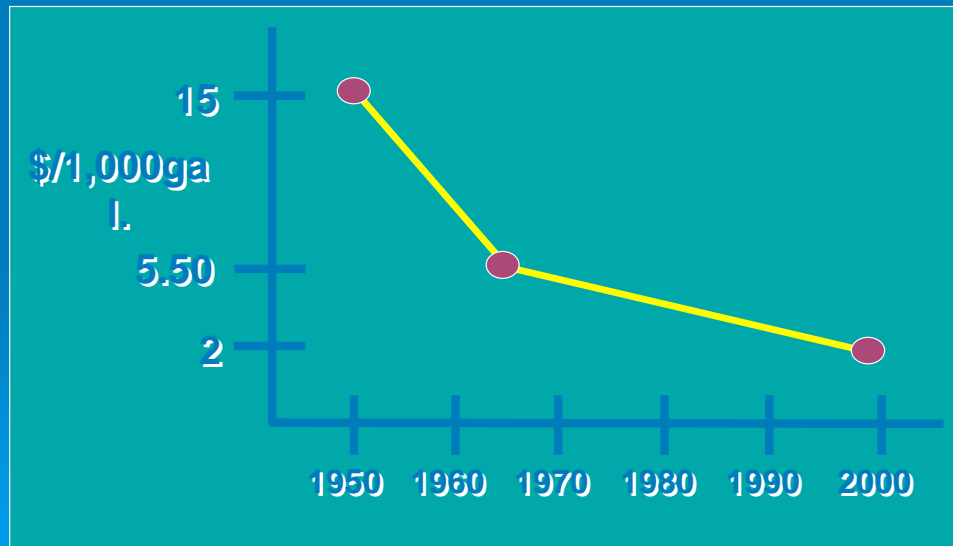
"If we could produce fresh water from salt water at a low cost, that would indeed be a service to humanity, and would dwarf any other scientific accomplishment."

--John F. Kennedy (April, 1961)

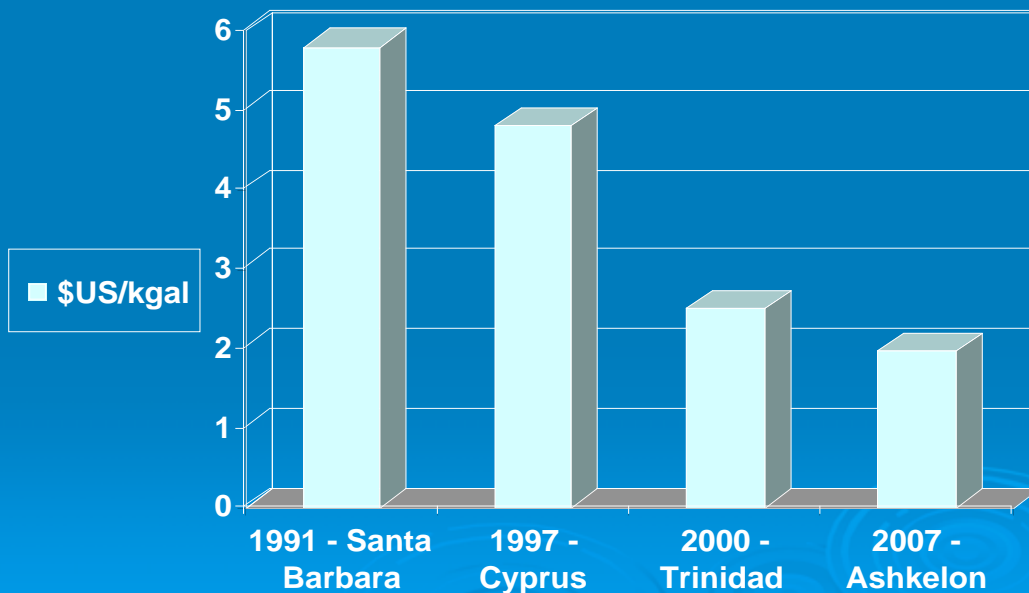


Best Available Technology

Membranes are becoming the technology of choice around the world today as the “best available technology” for water purification.



Desalination Costs Are Falling



The Bottom Line: Cost

<u>Time Frame</u>	<u>Utilities</u>	<u>Wholesale Cost</u>
1990s	City of Santa Barbara Water	~ \$6.00 / kgal
2000s	Tampa Bay Water; El Paso Water Utilities	~ \$1.85 - \$2.05 / kgal

Cost of imported water from MWD: ~\$1.66 / kgal

Cost of recycled water: ~\$0.75 - \$1.50 / kgal

Issues, Barriers, and Impediments

- Public perception
- Salinity and concentrate disposal
- Energy consumption and greenhouse gases
- Address emerging contaminants
- Need for innovative technologies
- Understand the economics of water reuse
- Support by local politicians
- Lack of available funding

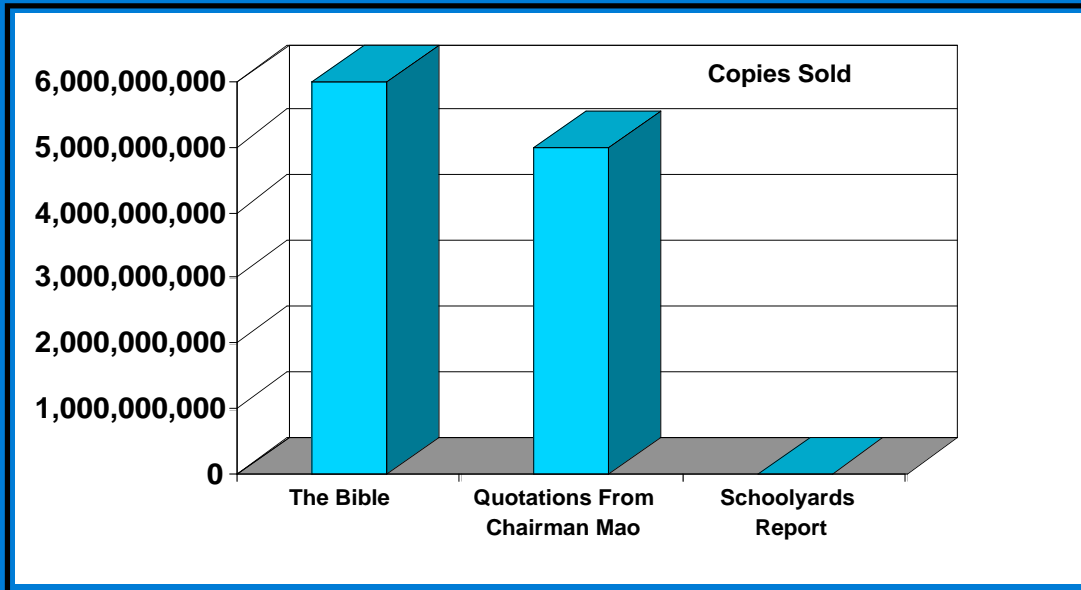
WaterReuse Association & Foundation

- WRA - National Trade Association
 - > 350 Members
 - State Sections in AZ, CA, FL, NV, & TX
 - Membership Growing at ~10%/Year
 - Advocacy -- National & State
- WRF - Research
 - \$4 million applied research program
 - 65 active projects

WRF Recently Published Reports

- Marketing Nonpotable Recycled Water
- An Economic Framework for Evaluating the Benefits & Costs of Water Reuse
- Dewatering RO Concentrate from Water Reuse Applications Using Forward Osmosis
- Irrigation of Parks, Playgrounds, & Schoolyards with Reclaimed Water: Extent and Safety

Worldwide Sales Comparison (Non-Fiction)



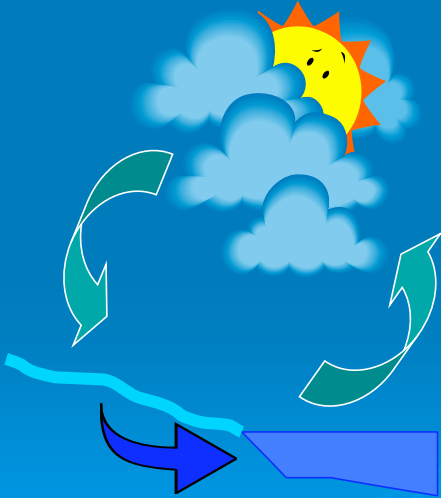
Summary & Conclusions

- Increasing need to augment water supplies with recycled/reclaimed water
- Opportunities for water reuse and desalination are numerous (~15% growth annually)
- Need to better understand the benefits and value of recycled water
- Overcome major barriers
 - Public acceptance
 - Salinity management
 - Energy consumption
 - Additional research



Take Home

ALL WATER IS REUSED!

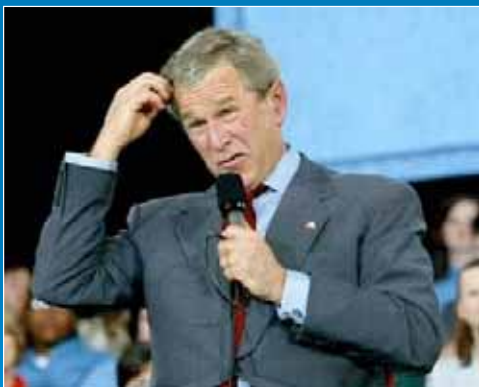


“We are all drinking dinosaur pee”

Bob Castle

Thank You!

Questions?



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