

Rethinking Wastewater: Water Reuse in the United States



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Sewage Farming (19th Century)



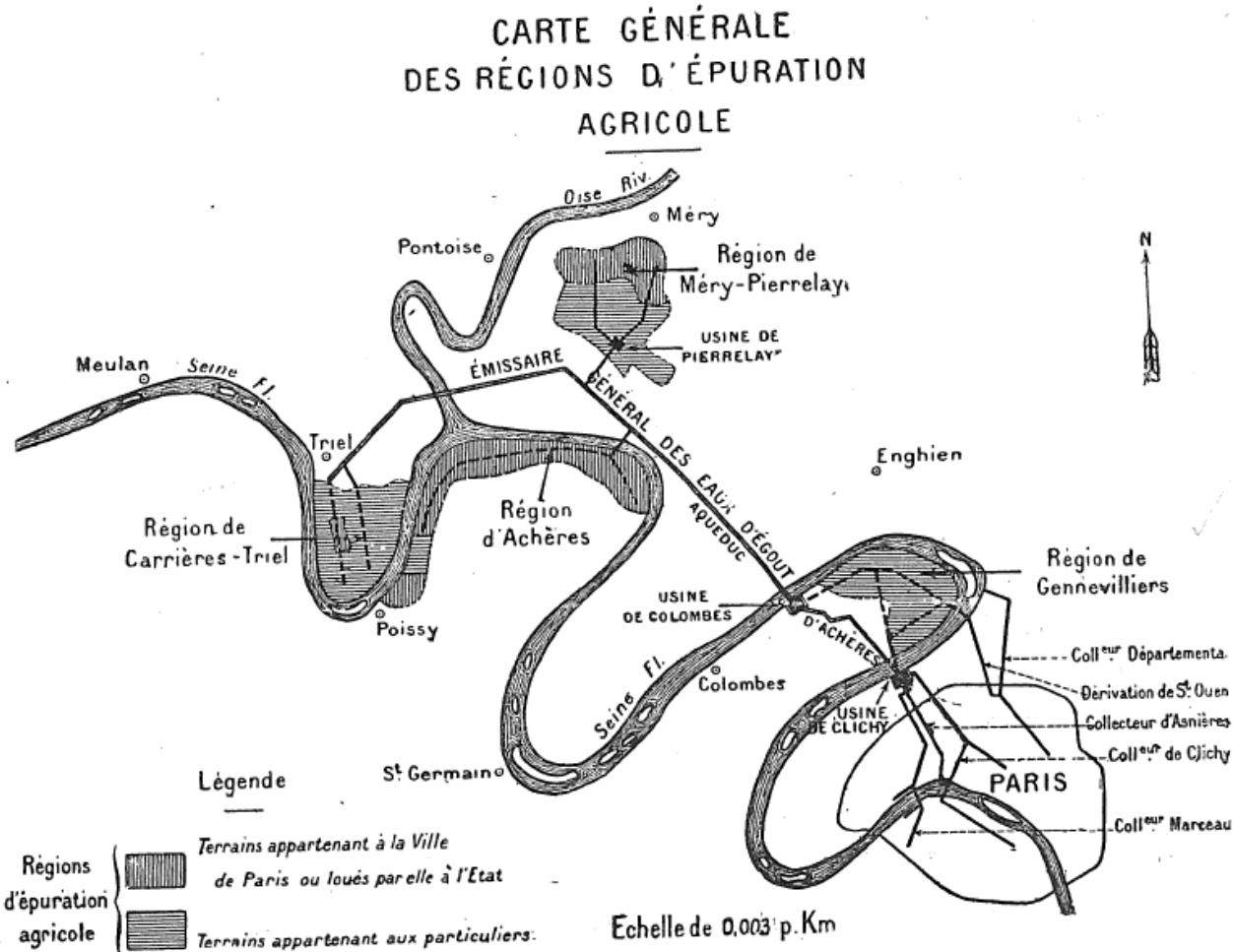
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Sewage Farming (19th Century)

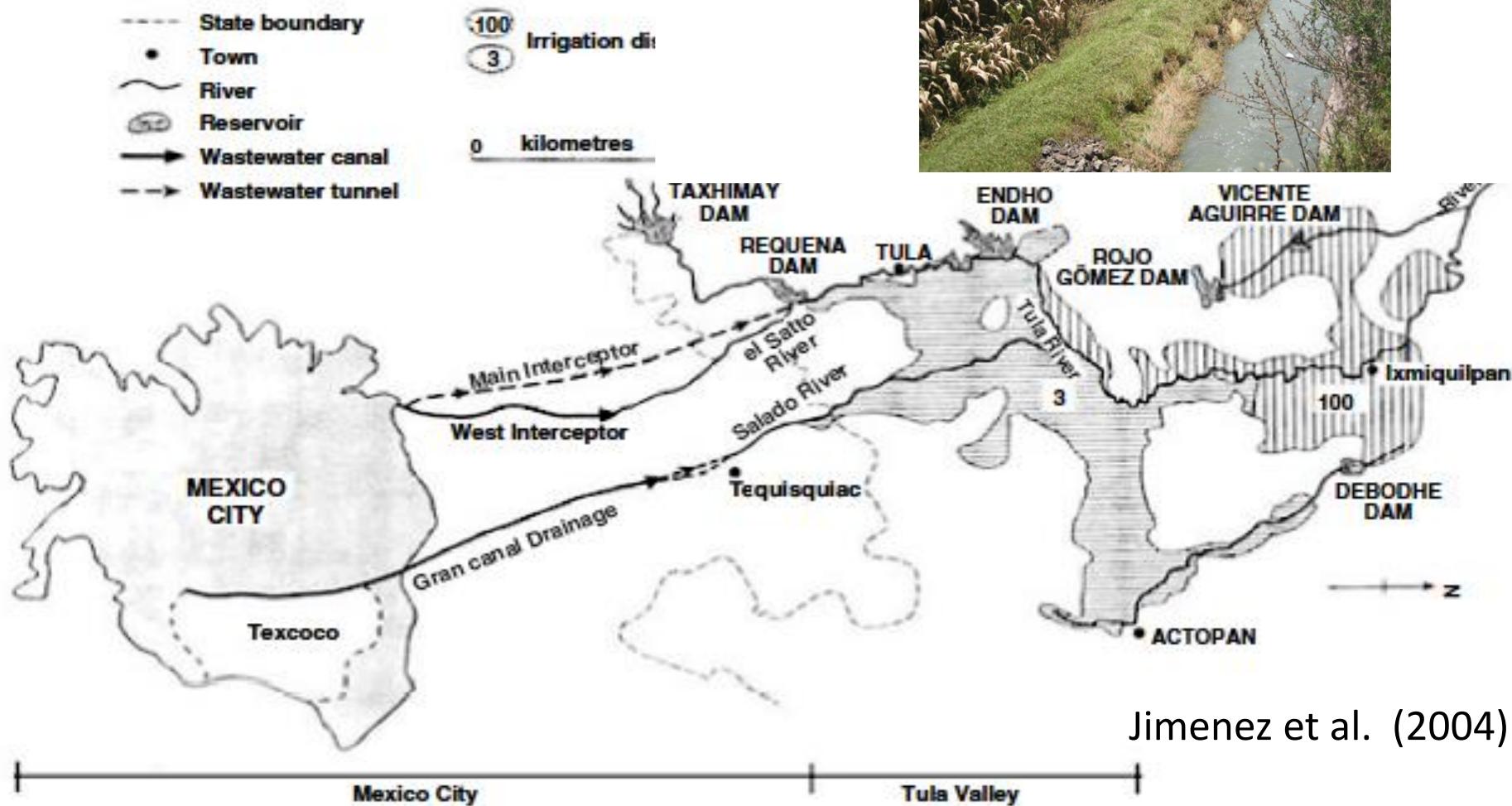




Sewage Farms in Mexico City

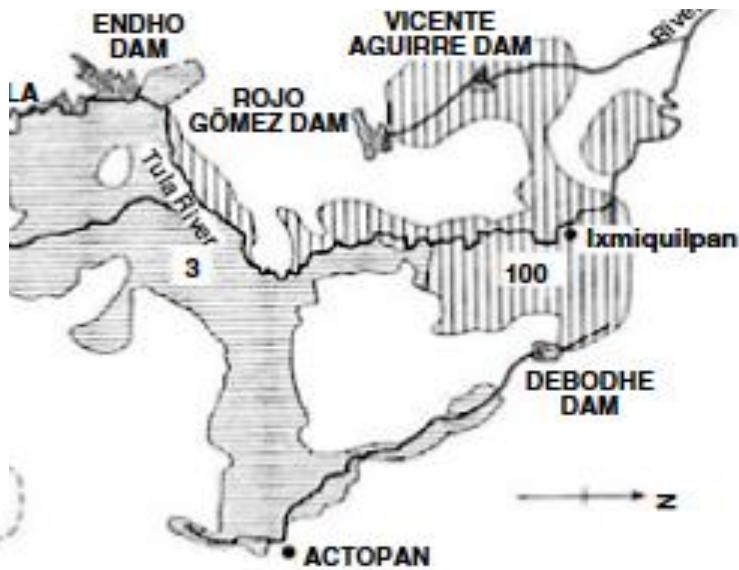
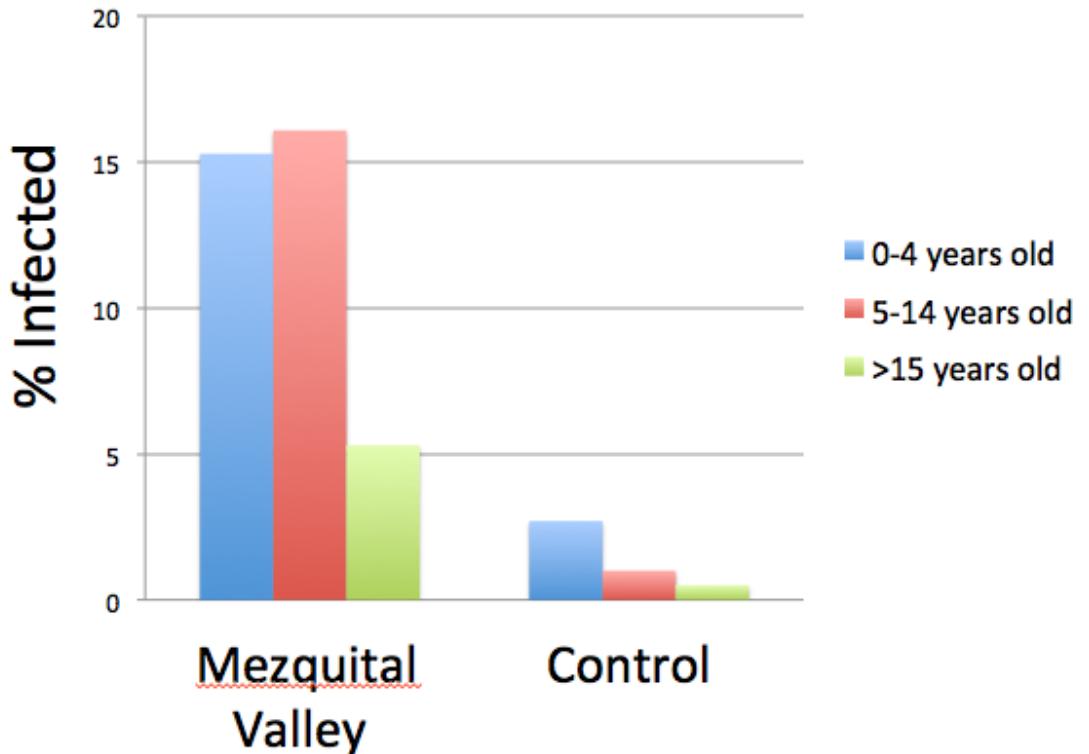


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Sewage Farms in Mexico City



Jimenez et al. (2004)



Effluent for Irrigation

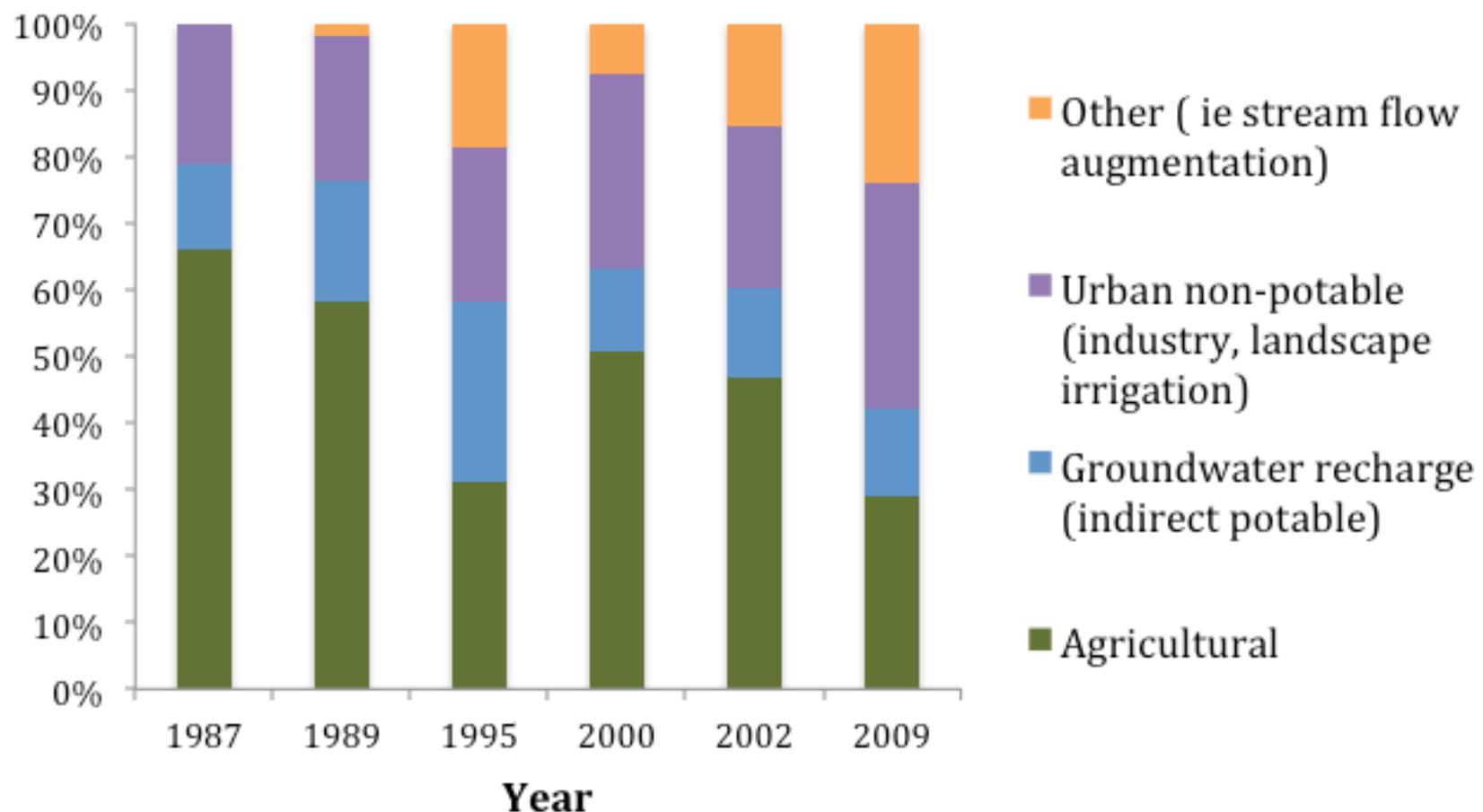


Monterey Regional Reclamation Plant



Effluent for Irrigation

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Monterey Regional Reclamation Plant



Water Reuse at West Basin

Irrigation (Title 22)



Edward C. Little
Water Recycling Facility



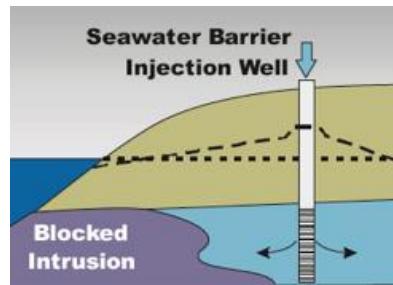
Cooling Towers



Low-Pressure Boilers (RO)



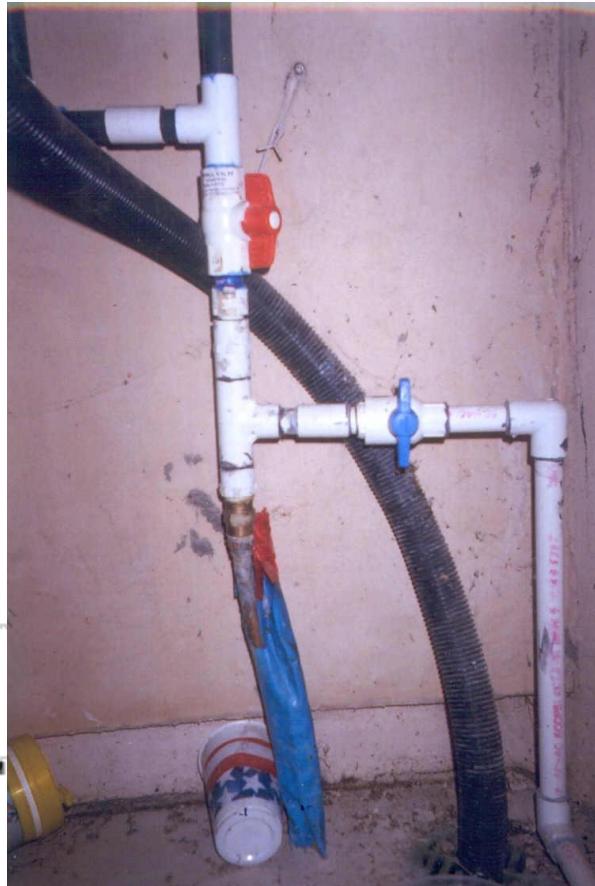
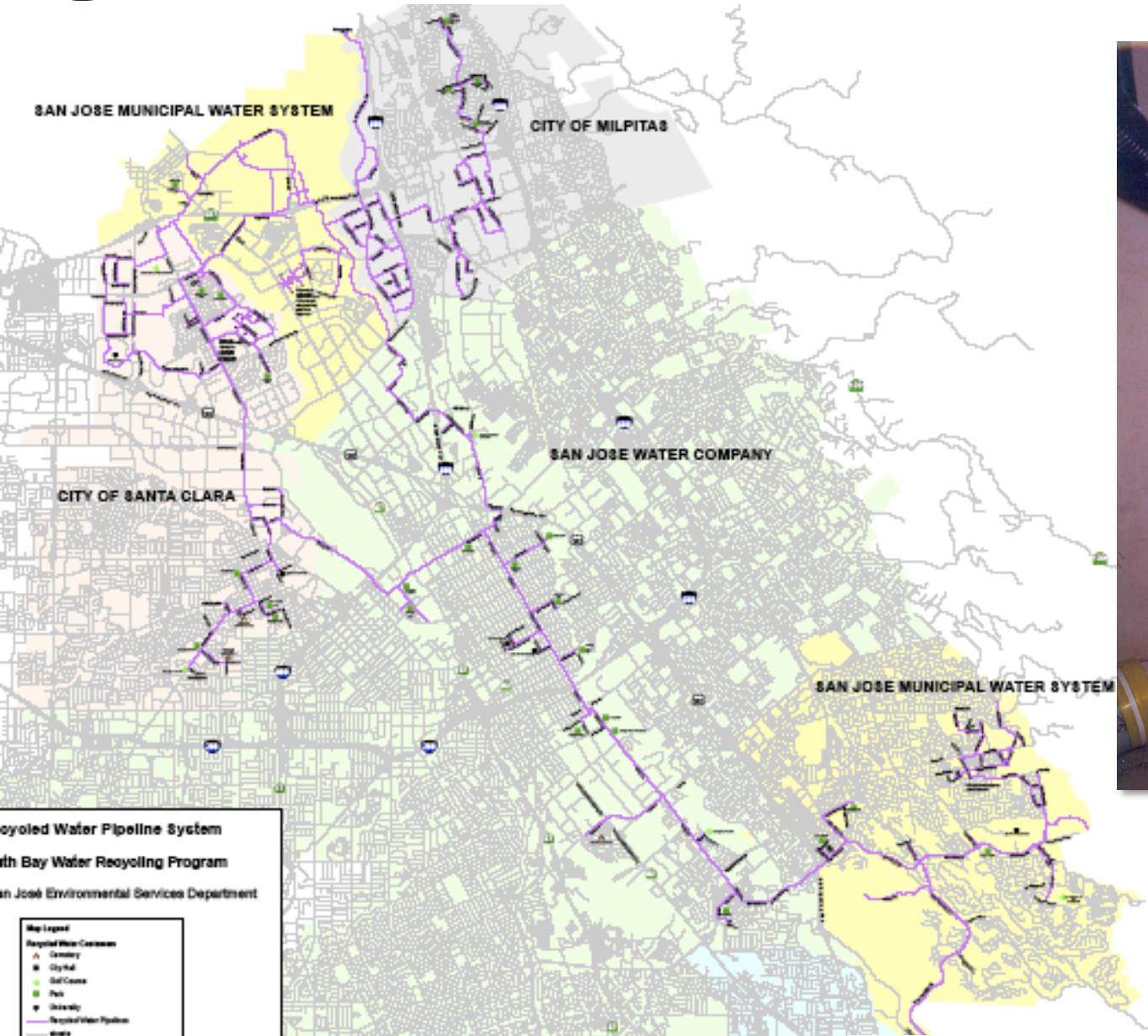
Groundwater Recharge (RO)



High-Pressure Boilers (RO)



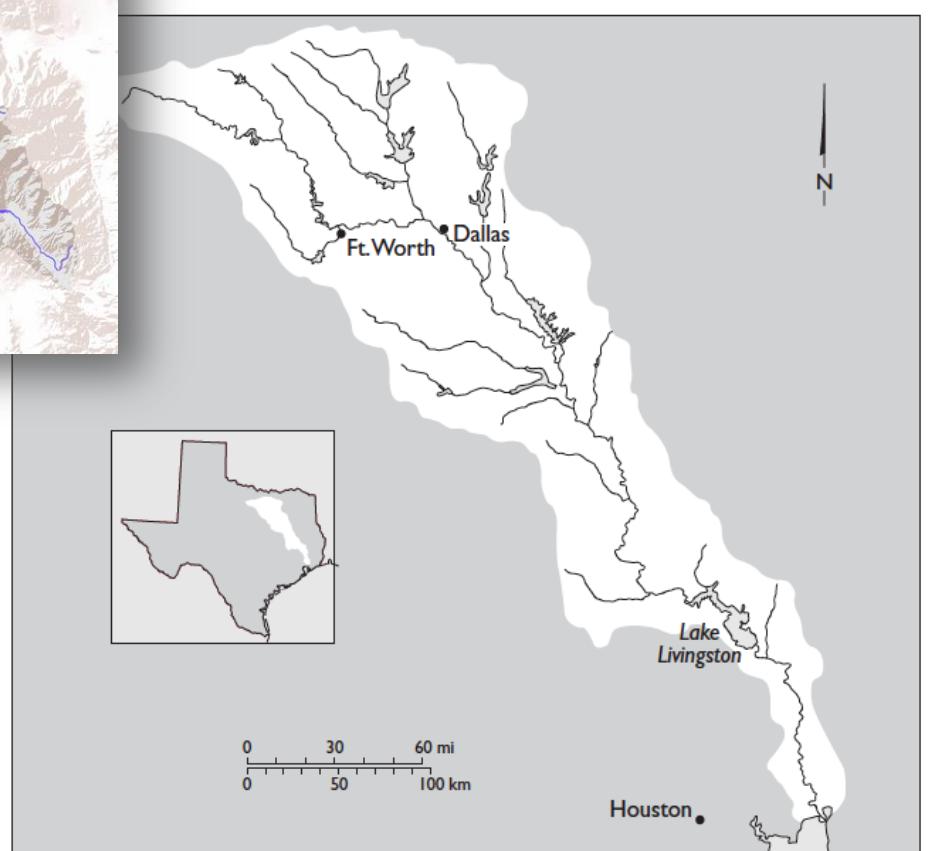
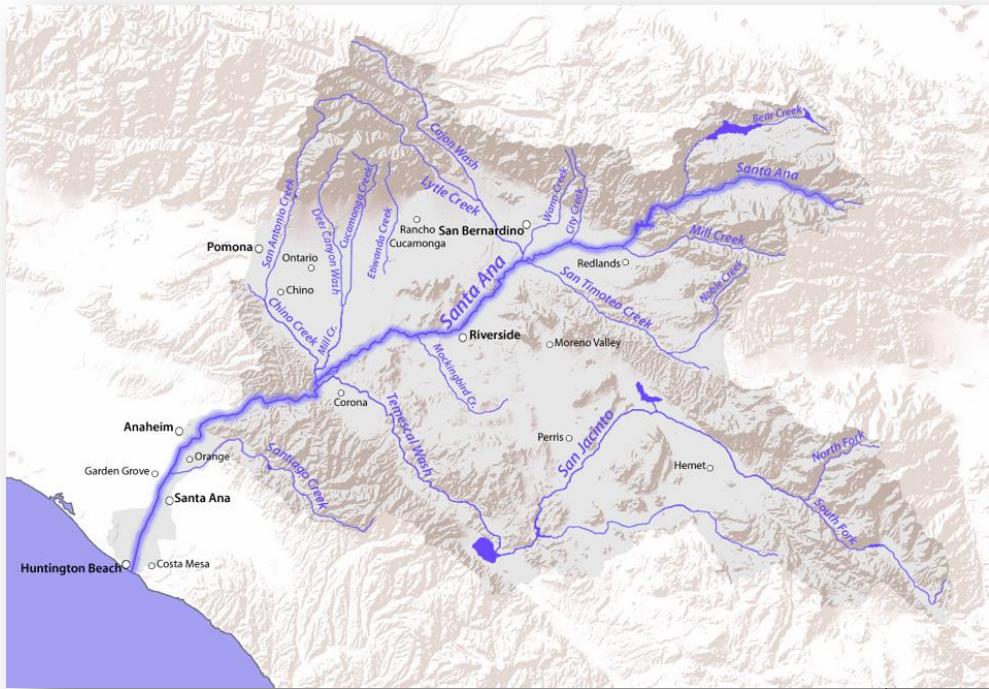
Limitations of Urban Irrigation





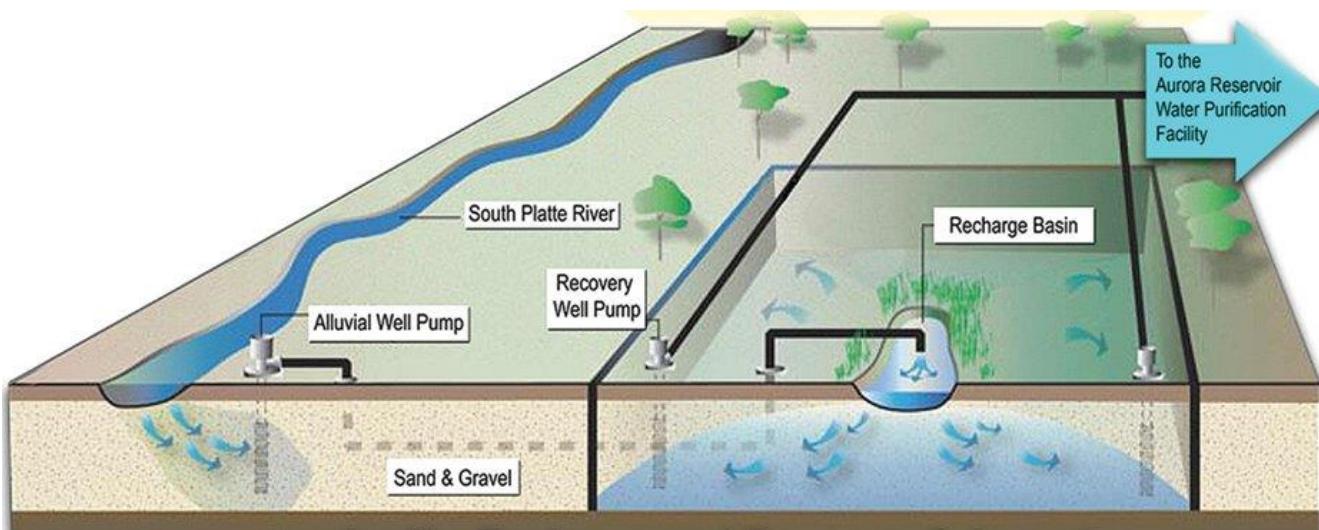
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De Facto Reuse





Managed Natural Systems



Potable Water Reuse

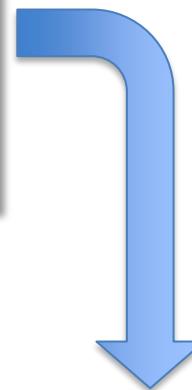
Wastewater Effluent



Reverse Osmosis



UV/H₂O₂



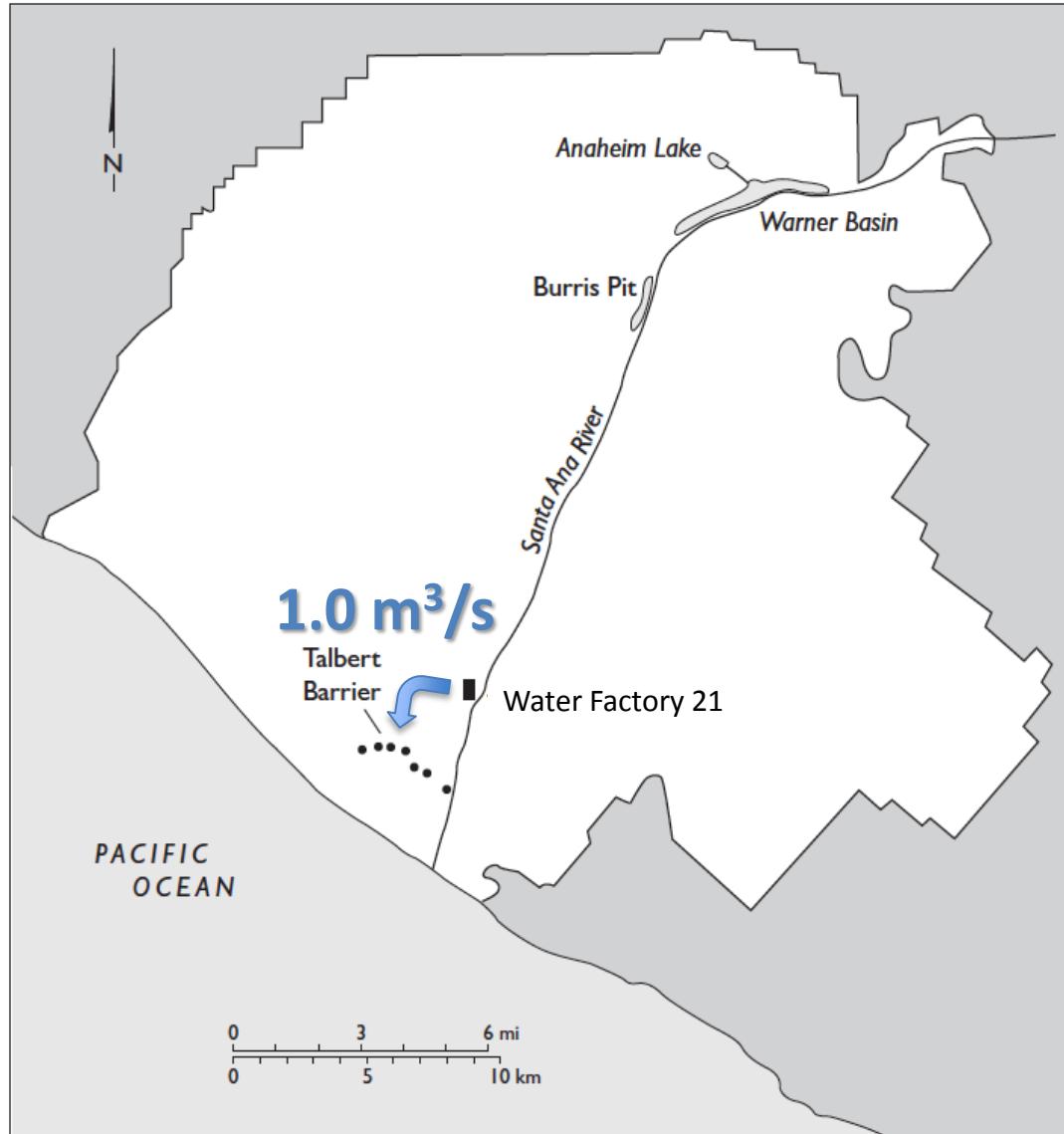
Drinking Water
Supply



Potable Reuse in Orange County



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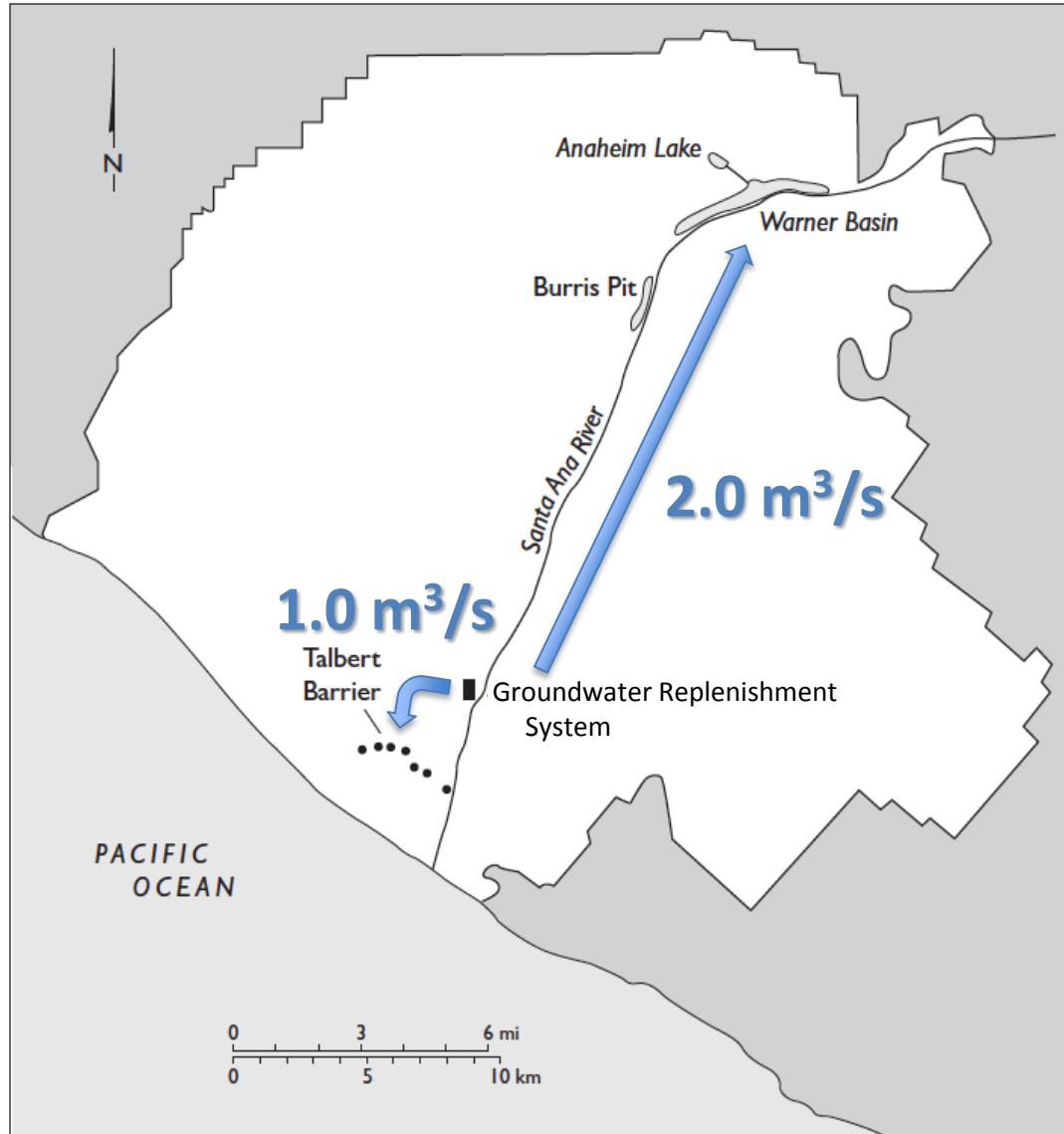




Potable Reuse in Orange County



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Three Dimensions of Legitimacy

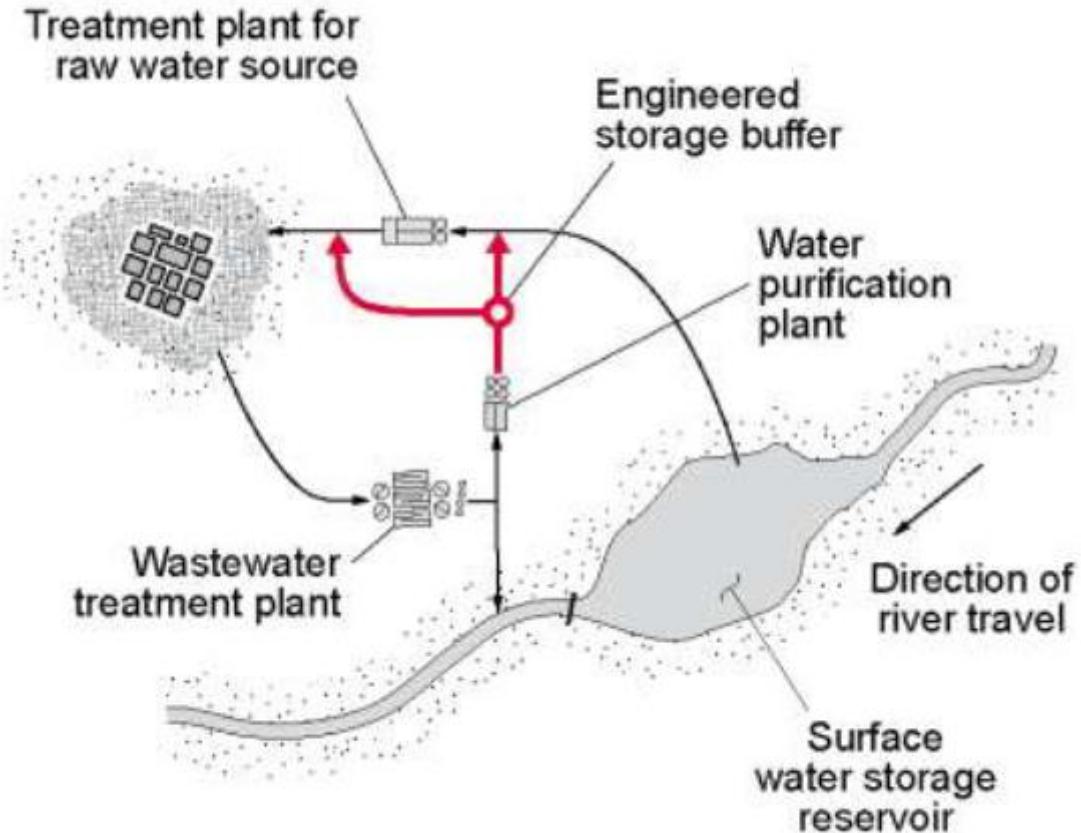


- **Pragmatic:**
Does it serve self-interest of the community?
- **Moral/normative:**
Does it comply with external quality standards?
- **Cognitive:**
Does it mesh w/cultural belief systems/daily experience?





Next Stop: Direct Potable Reuse



Tchobanoglous (2012)



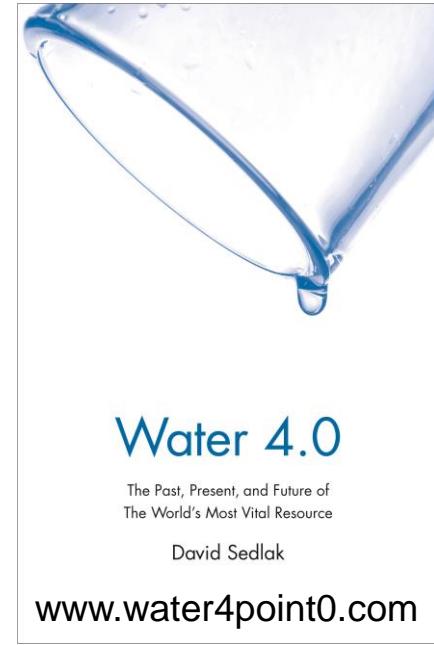
Final Thoughts

- **Wastewater is an Important Water Resource**
 - Drought resistant
 - Low GHG emissions relative to desalination
 - Benefits to public health and environment
- **Evolution in Practice**
 - Irrigation has limited potential in urban settings
 - Potable reuse is proven and increasingly accepted
 - Potable reuse requires institutional reform

Acknowledgments



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