

Water Reuse on the Municipal Scale:

Sustainable Solutions for the Rocky Mountain Region

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Outline

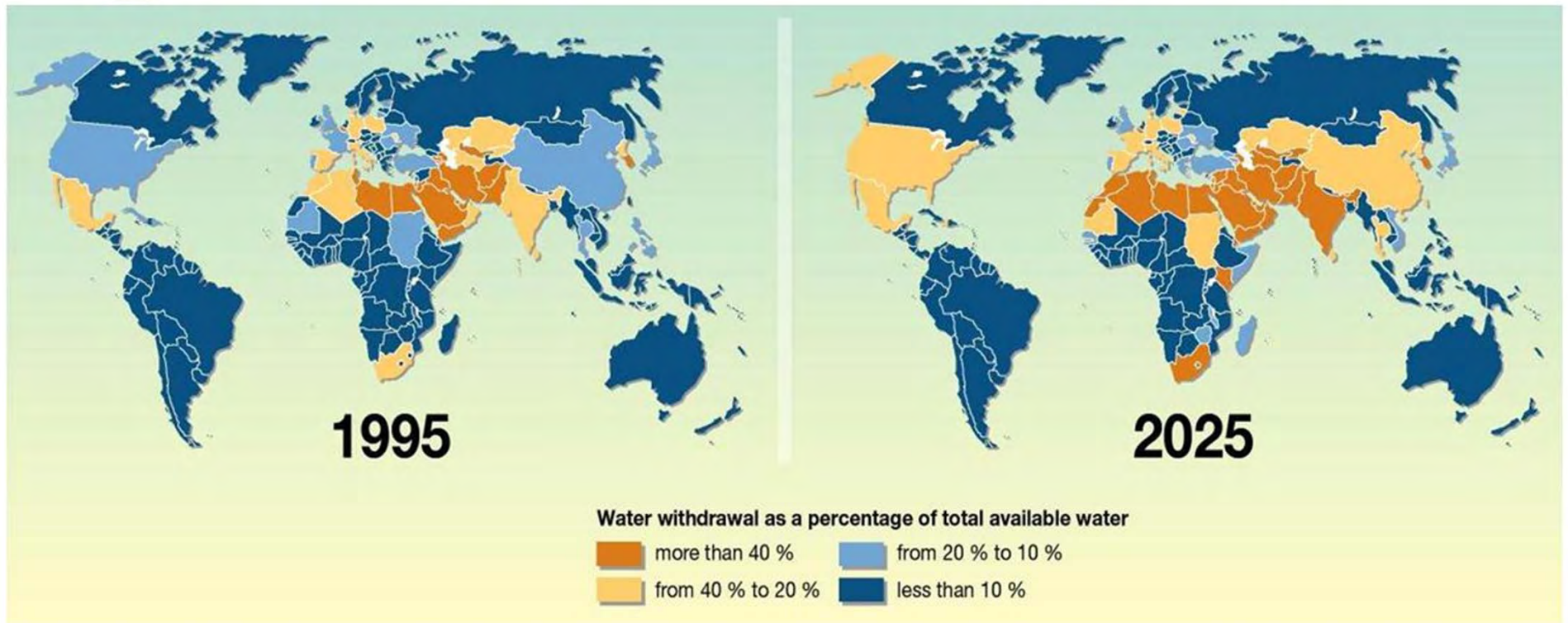
- **Drivers**
- **Types of water reuse**
- **Local trends & experiences**
- **Policy issues**
- **Overall considerations**





Global Water Stress

Source: UNEP; <http://maps.grida.no/go/graphic/increased-global-water-stress>



The Right Water



The Right Use



Normal Reservoir Condition



The Right Water



The Right Use



Drought Reservoir Condition



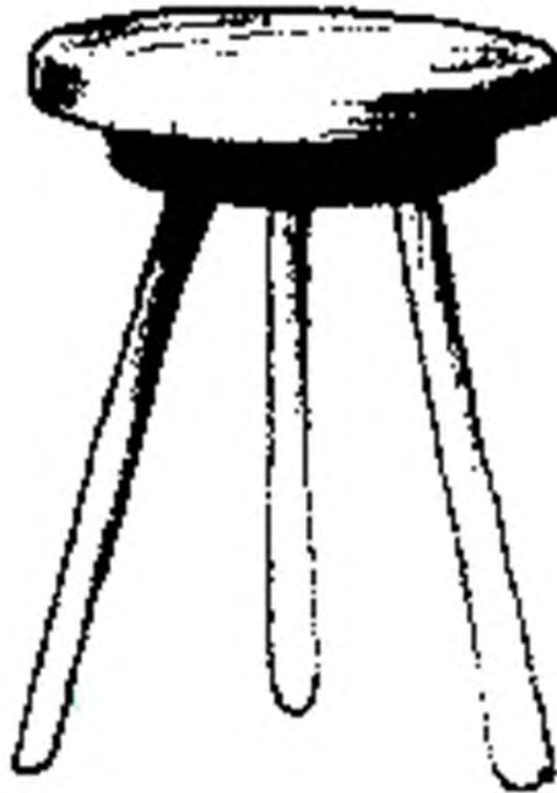
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The Right Use



Integrated Resource Planning



Conservation

Recycling

New Supply

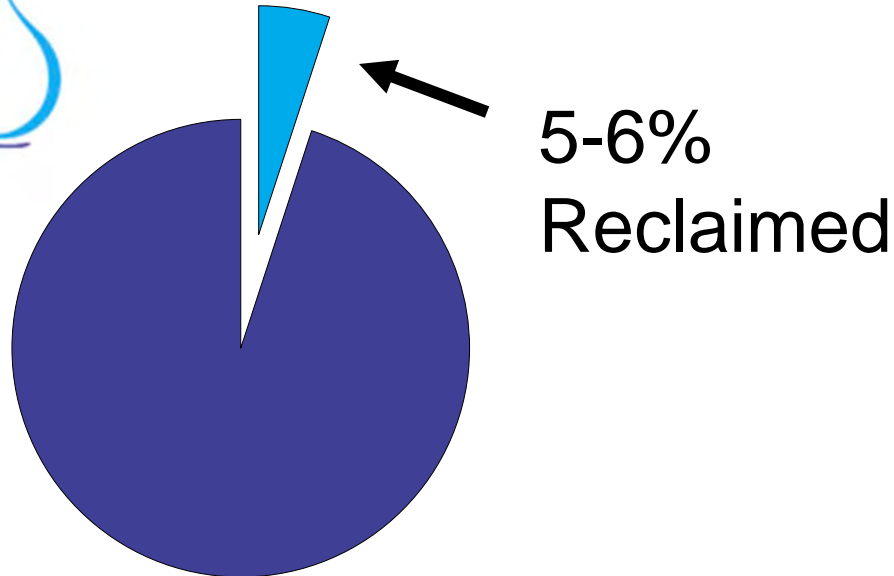
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The Right Use



Potential for Water Reuse



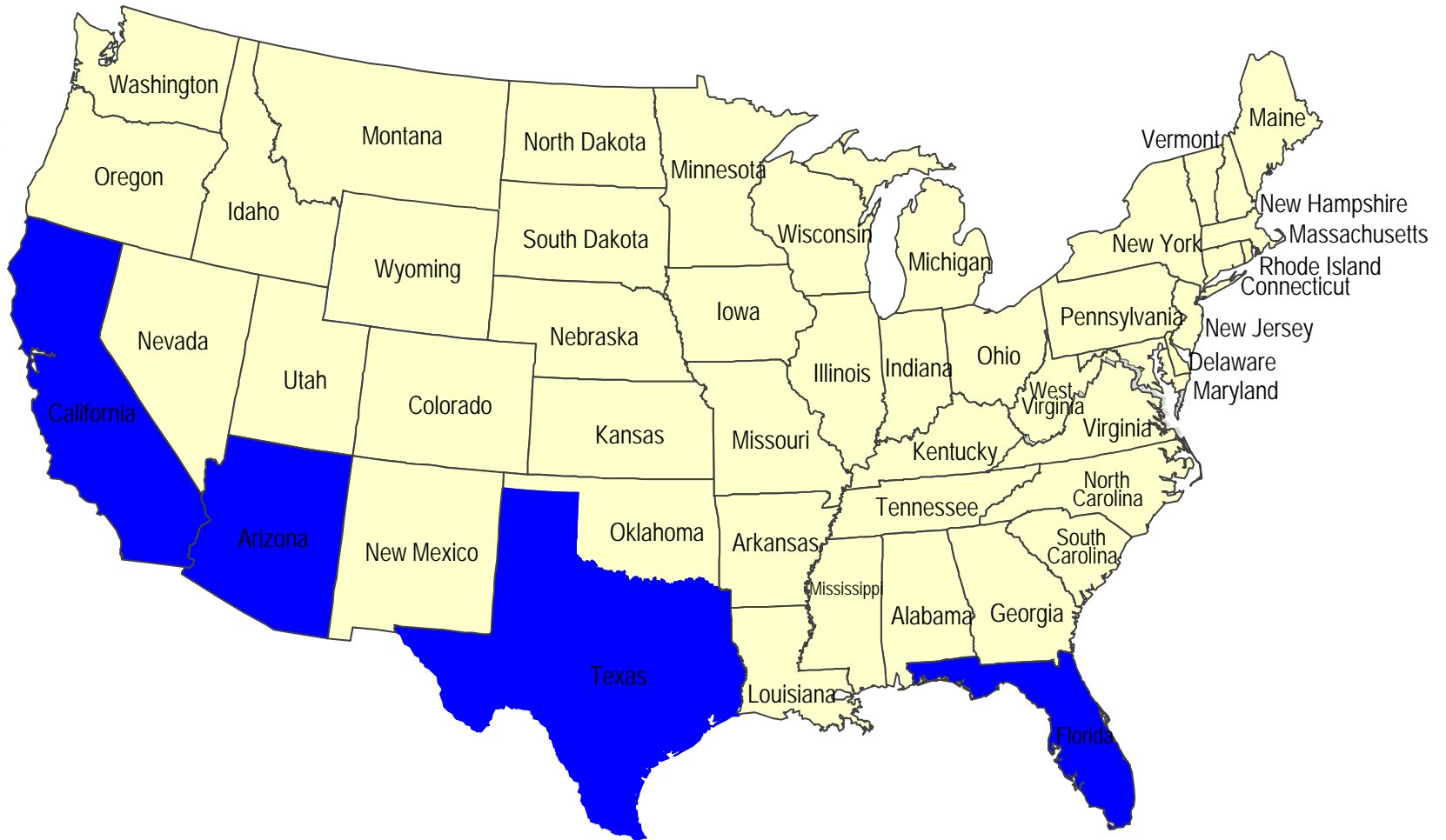
- **1 ac-ft serves 2.5 single-family homes**
- **Implementation costs: \$2k-\$100k/ac-ft**

35 billion gallons per day wastewater effluent in the U.S.





Most water reuse in the U.S. occurs here...



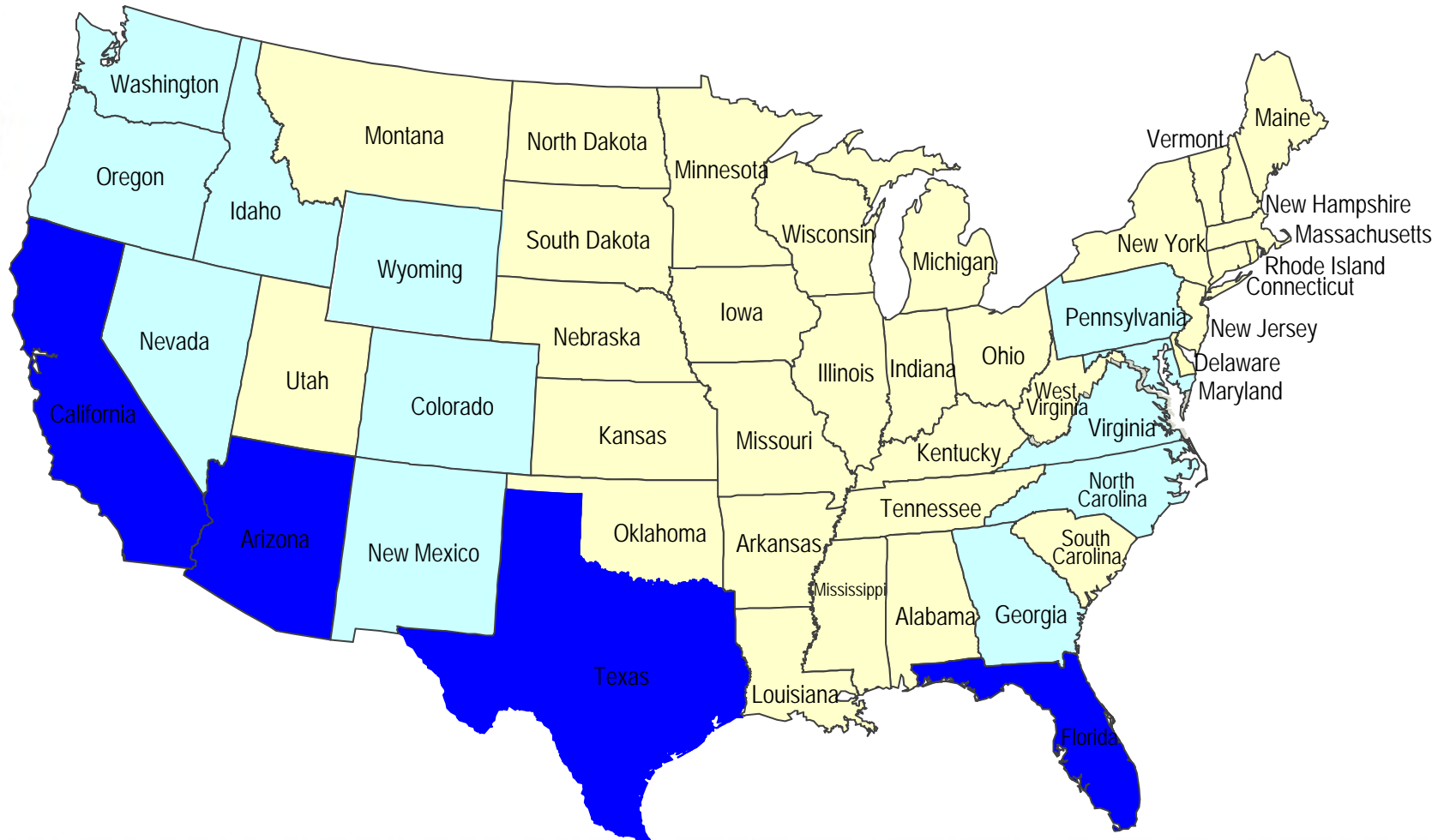
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The Right Use

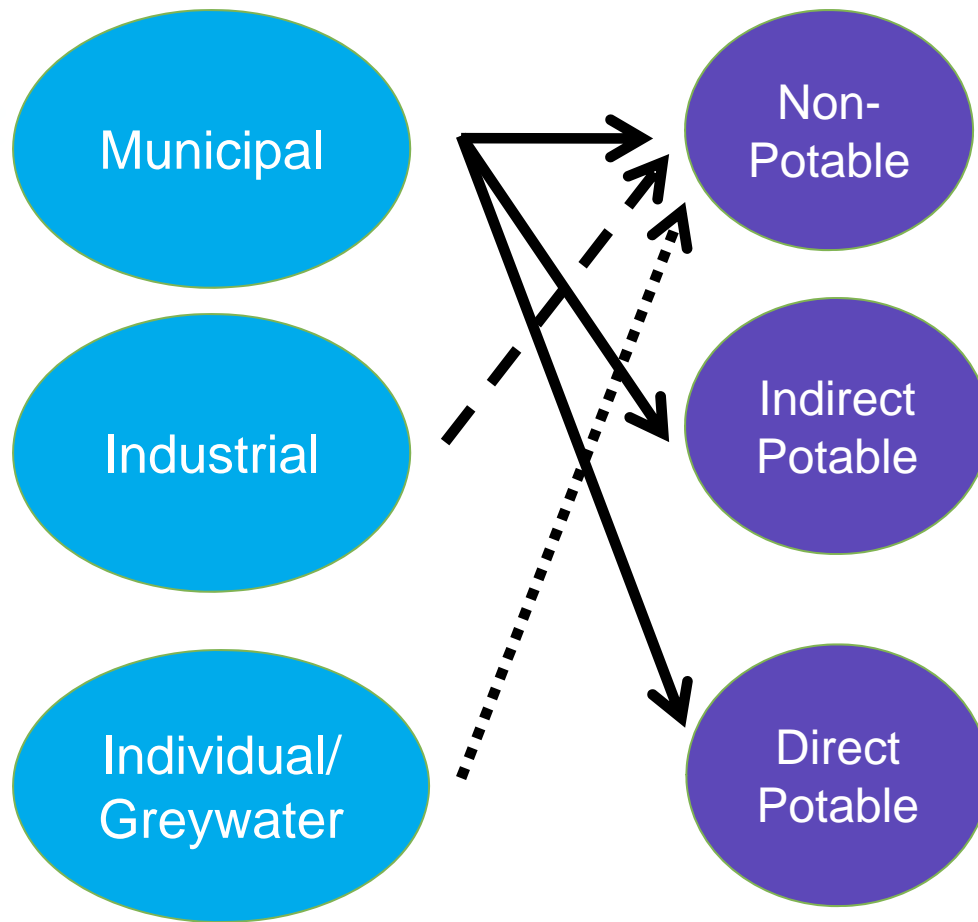


...growing in other states

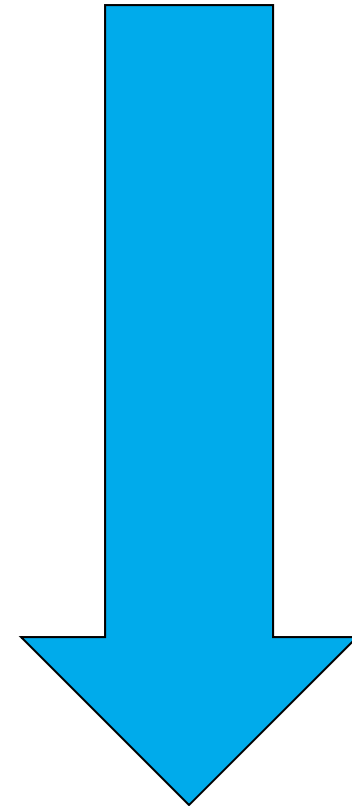




Types of Reuse



**Increasing Cost
& More
Stringent
Regulations**



The Right Water



The Right Use



Rocky Mountain State Major Headwaters



The Right Water



The Right Use



Rocky Mountain Region Considerations

- **Western water law**
- **Arid regions**
- **Population growth**
- **Limited water supplies**





Rocky Mountain Region

State	No. of Municipal Programs	End Uses	State Regulations
AZ	15+	IPR, NP	Y
CO	20+	IPR, NP	Y
ID	2	NP	Y
MT	No data	G	Y
NV	5	NP	Y
NM	10	IPR	N
UT	7	NP	Y
WY	No data	No data	Y

- **NP: non-potable**
- **IPR: indirect potable reuse**
- **G: graywater**

The Right Water



The Right Use



How is water reused?





Typical Requirements for Non Potable Reuse

- **Discharge limitations**
 - Surface water
 - Groundwater
- **Specially marked equipment**



- **Public notification**
- **Time of day use restrictions**



The Right Water



The Right Use



Benefits of Water Reuse

- **Lessens load on drinking water system**
- **Delays requirement for developing new drinking water supplies**
- **Dependable source of supply**
- **Reliable, consistent quality**
- **Required for sustainable growth**
- **Lower cost alternative**
- **Satisfy water rights requirements**
- **Right water for the right use**





Rocky Mountain Region Future Trends

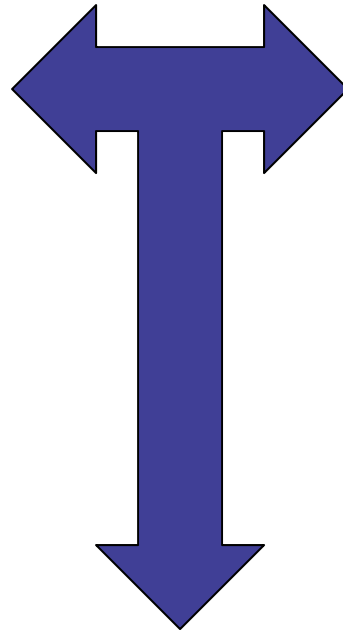
- **Water reuse as a critical part of municipal water supply**
- **More municipal scale non-potable reuse**
- **More uses for non-potable reuse**
- **More indirect potable reuse**
- **Graywater programs being developed**
- **New water quality issues & solutions**
- **Increase public outreach**





Technical Issues

- Water rights
- Water quality
- Availability
- Capital costs
- Infrastructure limitations
- Energy requirements



Institutional Issues

- Funding
- Public perception
- Regional planning
- Regulatory agency coordination
- Competing municipal priorities
- Water availability equity

Implementation

The Right Water



The Right Use



Contact Details & Resources

- **Abigail Holmquist**
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- **WaterReuse Association**
<http://www.watereuse.org/association>
- **Rocky Mountain Reuse Committee**
<http://rmwea.org/rmwea/committees/reuse/reuse.htm>
- <http://www.athirstyplanet.com/>

