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2008

Outdoor Water Use Efficiency

Urban Water Demand Roundtable

April 18, 2013

Rick Marsicek
Aurora Water





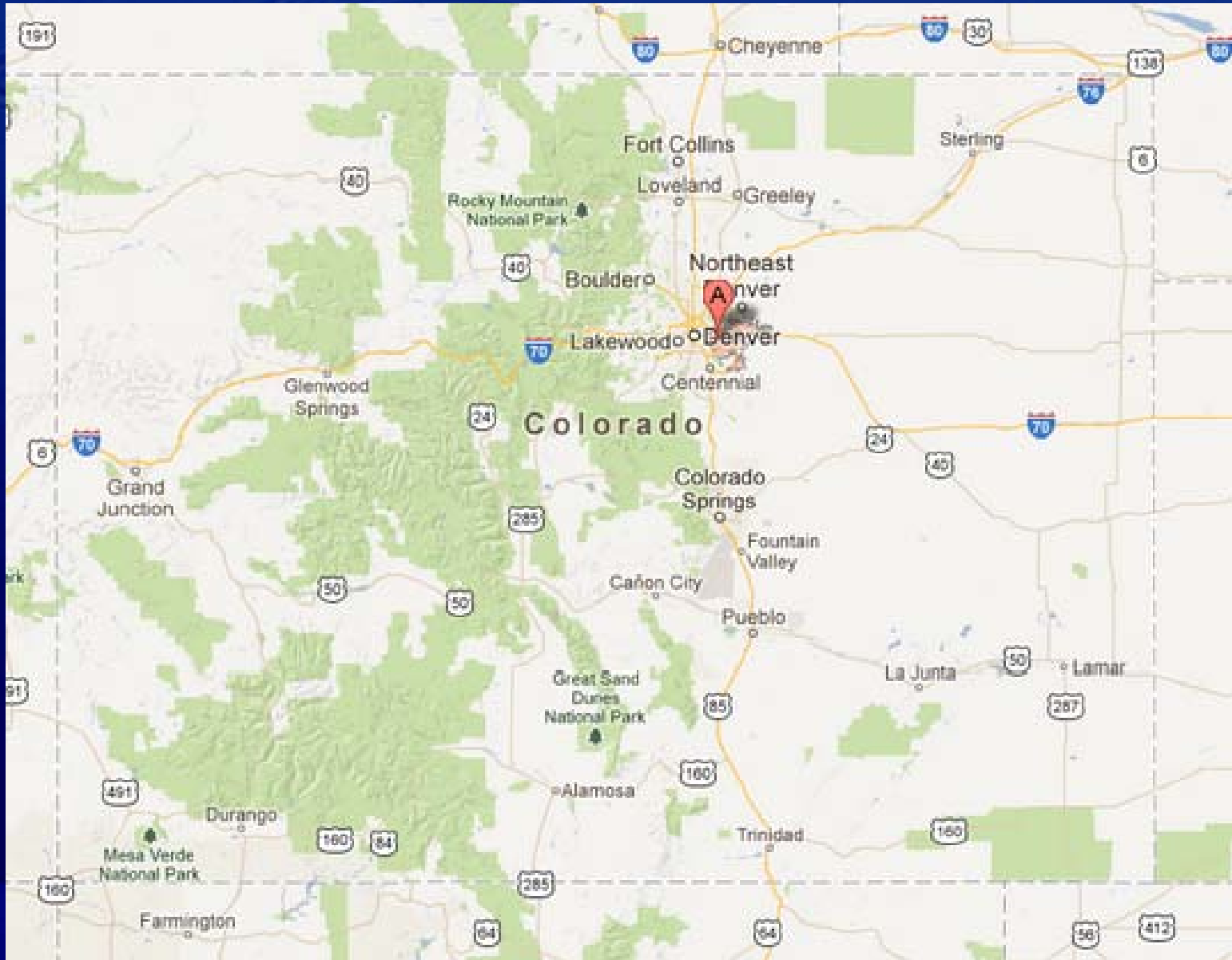
Aurora, CO

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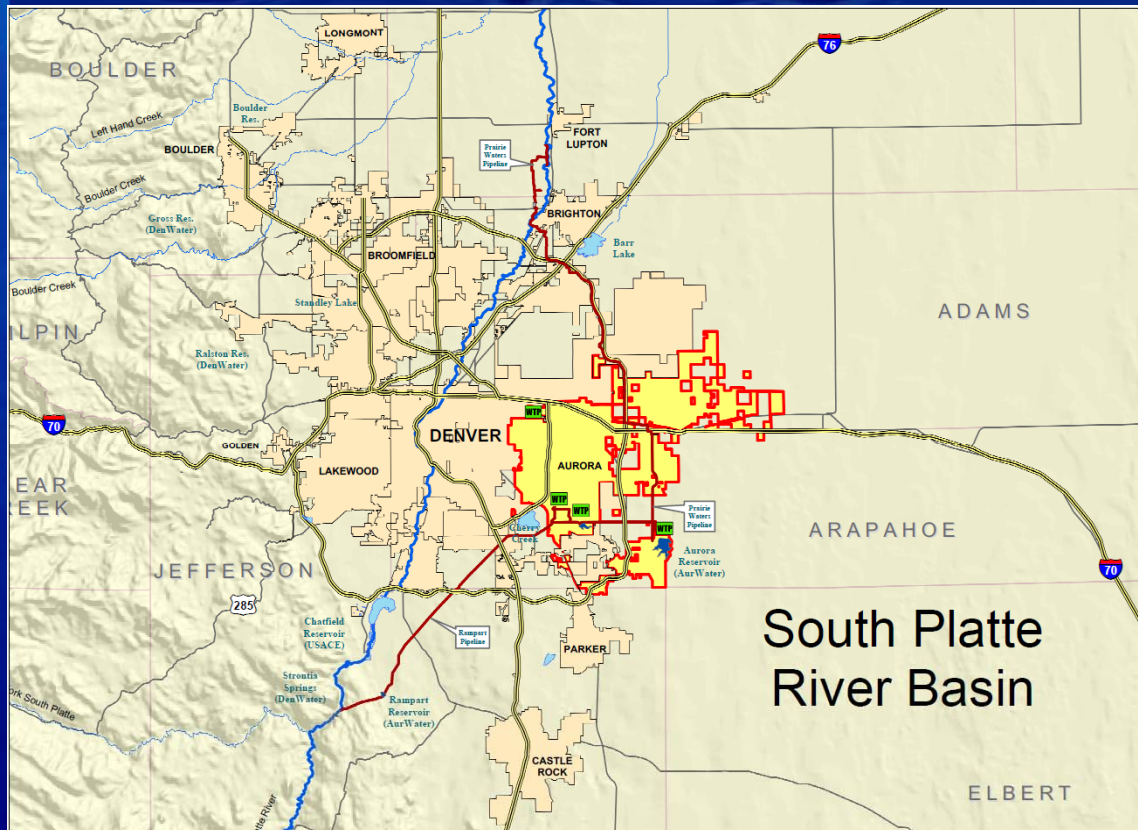


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Aurora Water

- Third largest Municipal Water Provider in Colorado



- Population: 336,000
- Accounts: 78,500
- Annual Demand: 50,000 af
- Residential usage: 89gpcd



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Variable Yields

Historical Annual Gross Yields (in acre-feet) by River Basin

Basin	Average	Dry Year Yield	Wet Year Yield
Colorado River Basin	22,779	6,272	36,399
Arkansas River Basin	18,821	9,723	30,912
South Platte River Basin	40,664	20,507	74,150
System Total	82,264	36,502	141,462



1982



2002



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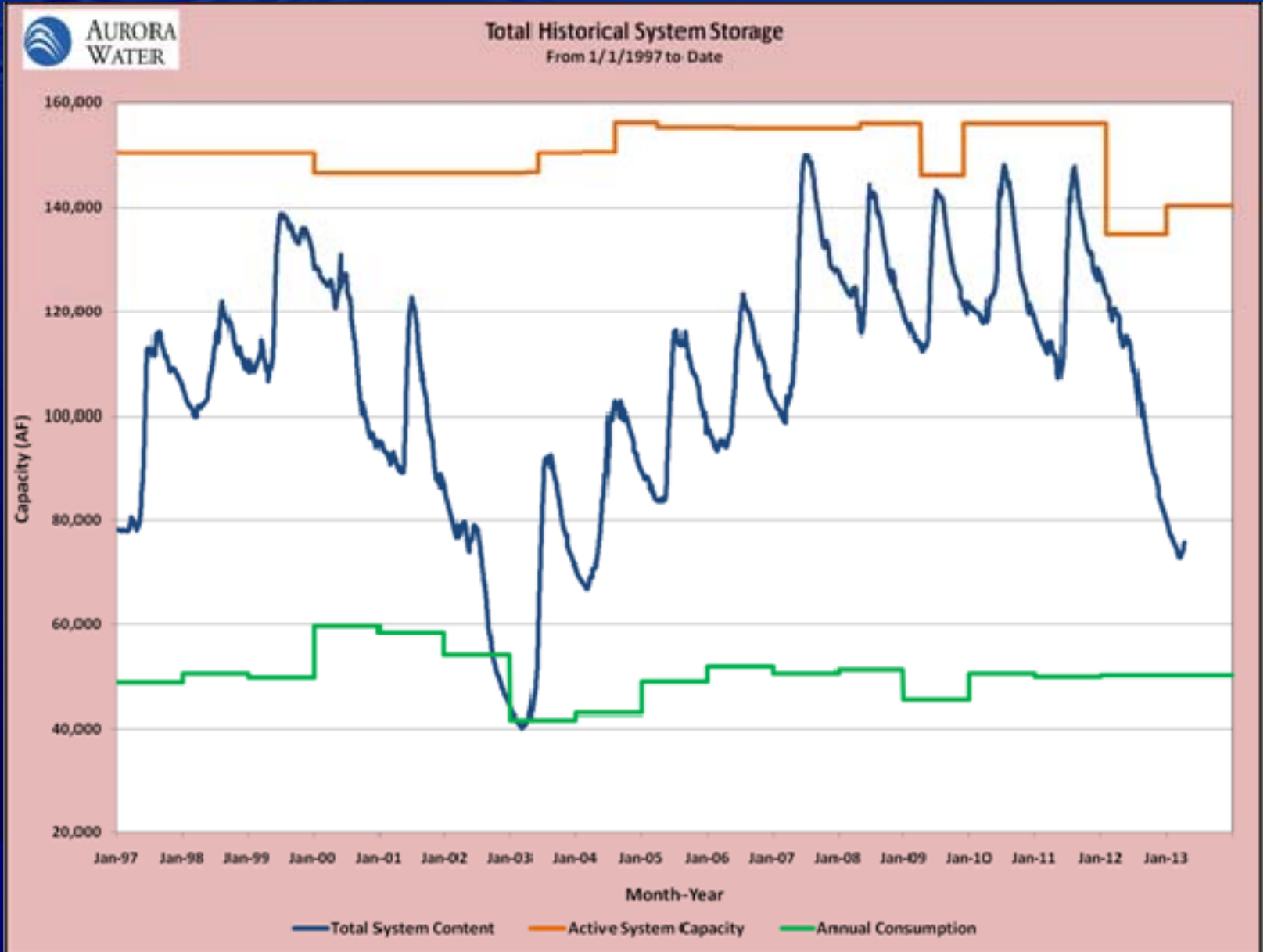
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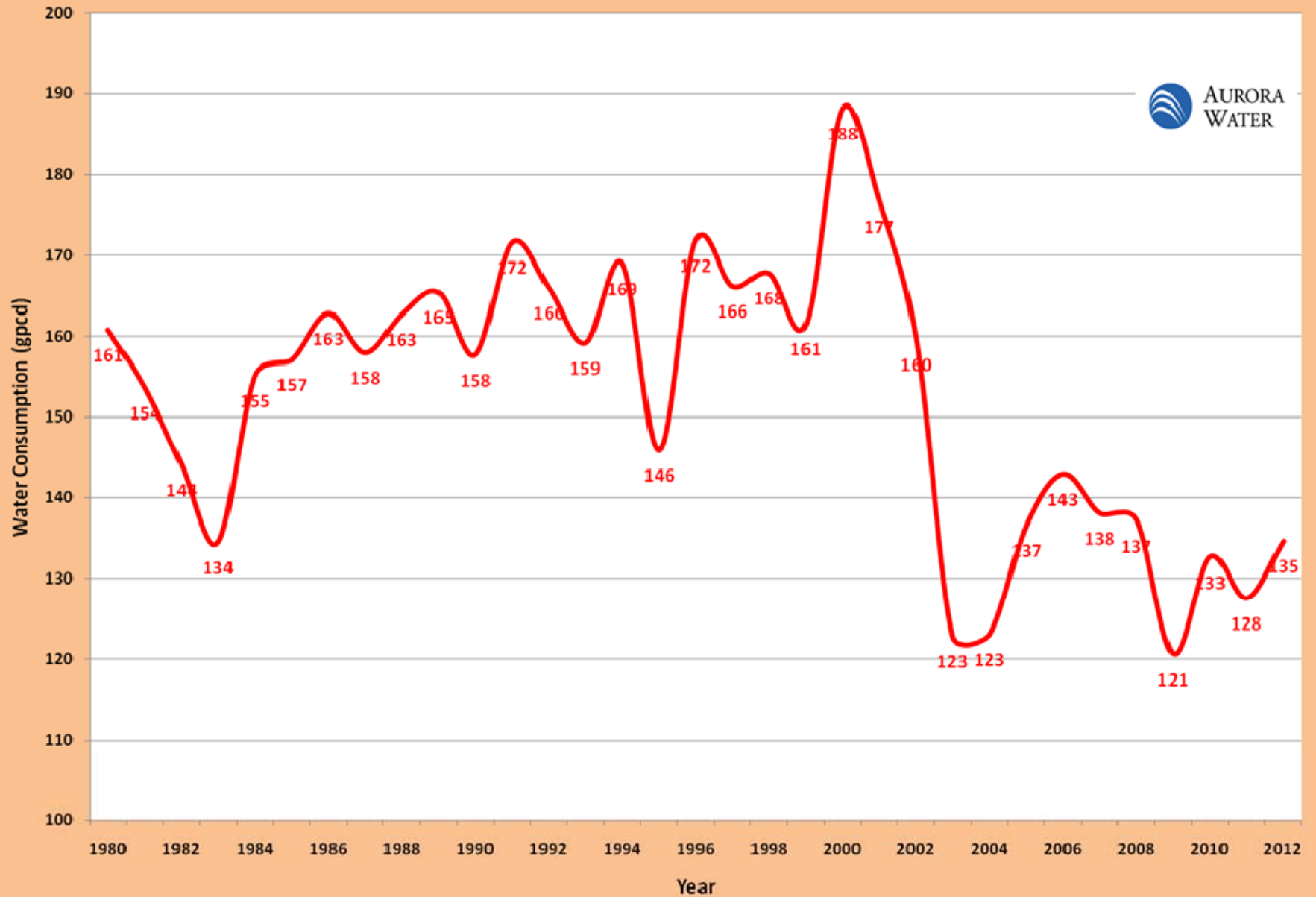
Aurora's Reservoirs





Historic Demands

Aurora Water Historical Consumption (gpcd)



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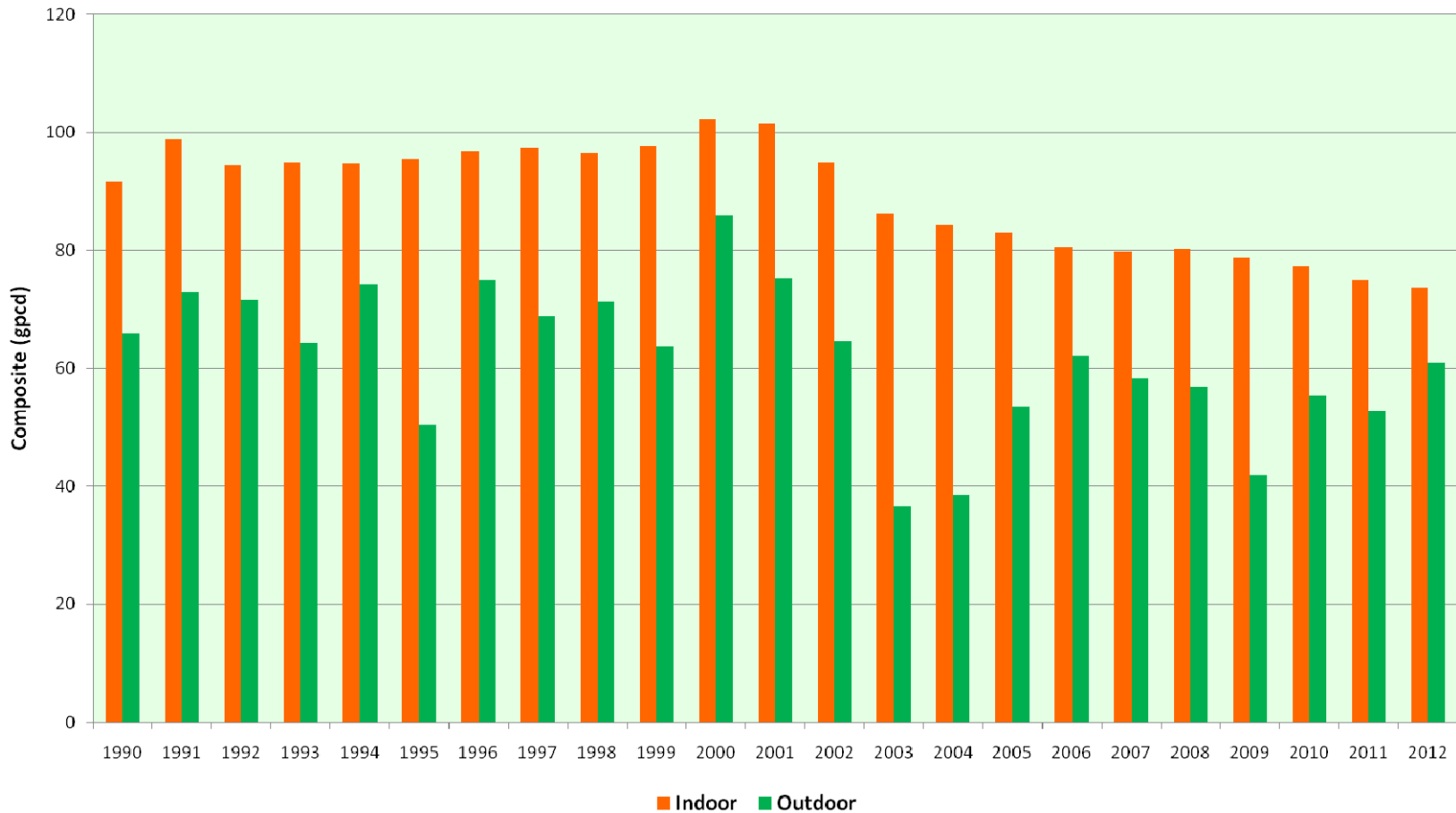


Historic Demands

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Aurora Water - Water Usage 1990 - 2012





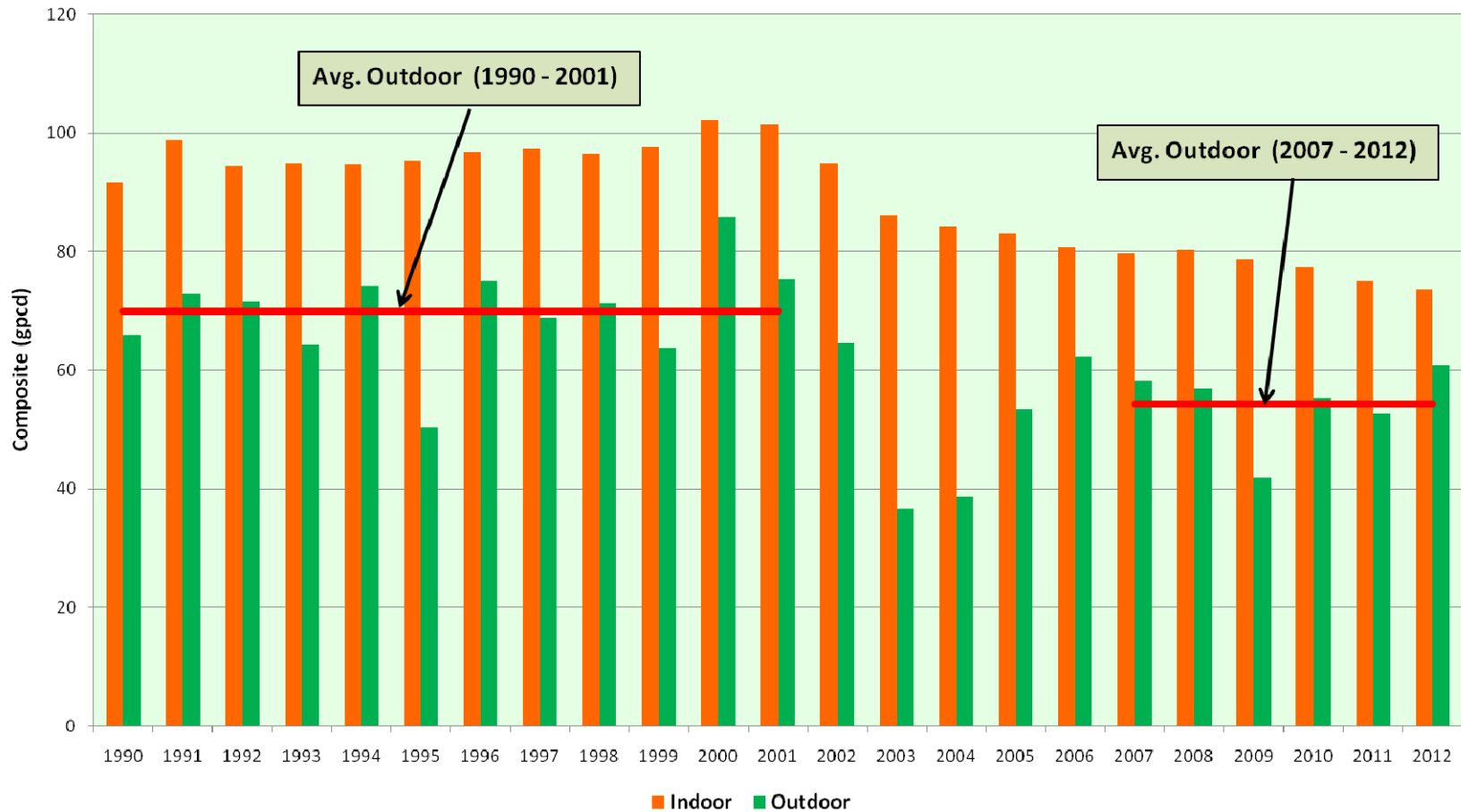
Historic Demands

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200

Aurora Water - Water Usage 1990 - 2012





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Demand Questions

- Water Resources:
 - Will demands stay at current levels? Decrease? Increase?
- Conservation:
 - Can we have a more proactive approach to conservation?



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Outdoor Irrigation Efficiency Study

- Develop a water-use map for visualization and planning
 - Target inefficiencies
 - Actively contact customers
 - Rebate most inefficient uses – improve water savings and ROI
-
- Total Cost under \$200k (\$120k state grant)



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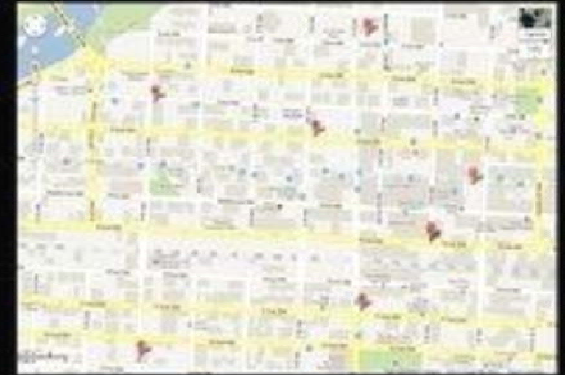
GIS



What my friends think I do



What my mom thinks I do



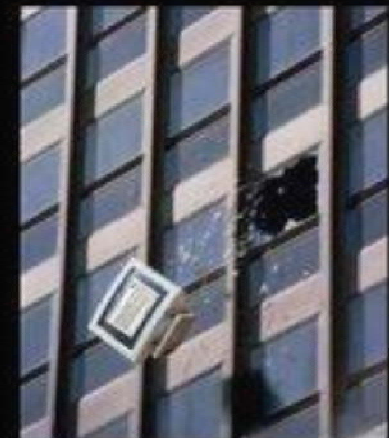
What society thinks I do



What my clients think I do



What I think I do



What I really do



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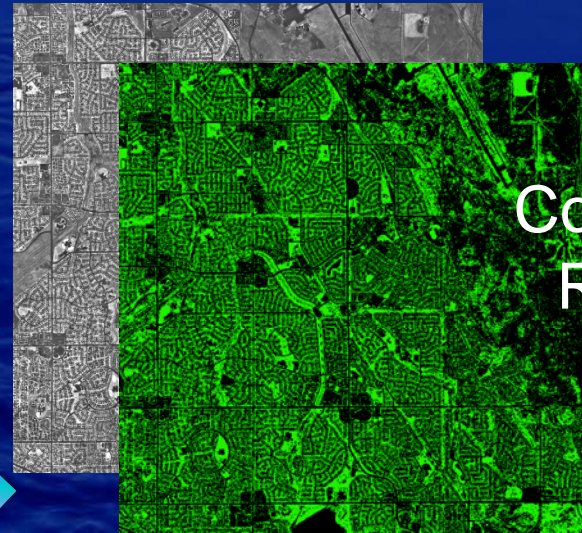


City Mapping Project

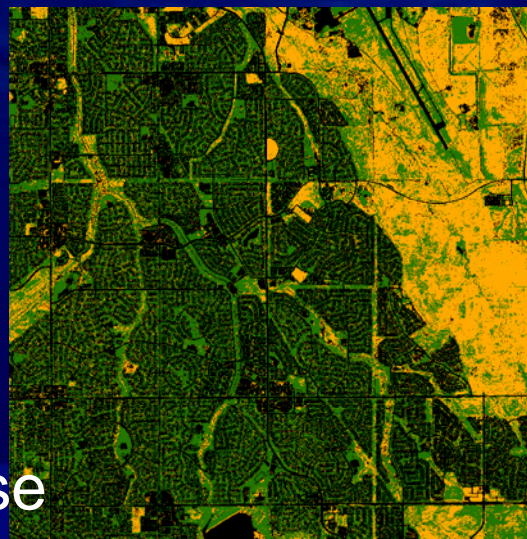
Clip
Imagery to
Tiles



Compute /
Render
NDVI



Base
Classification



Vegetation
Analysis





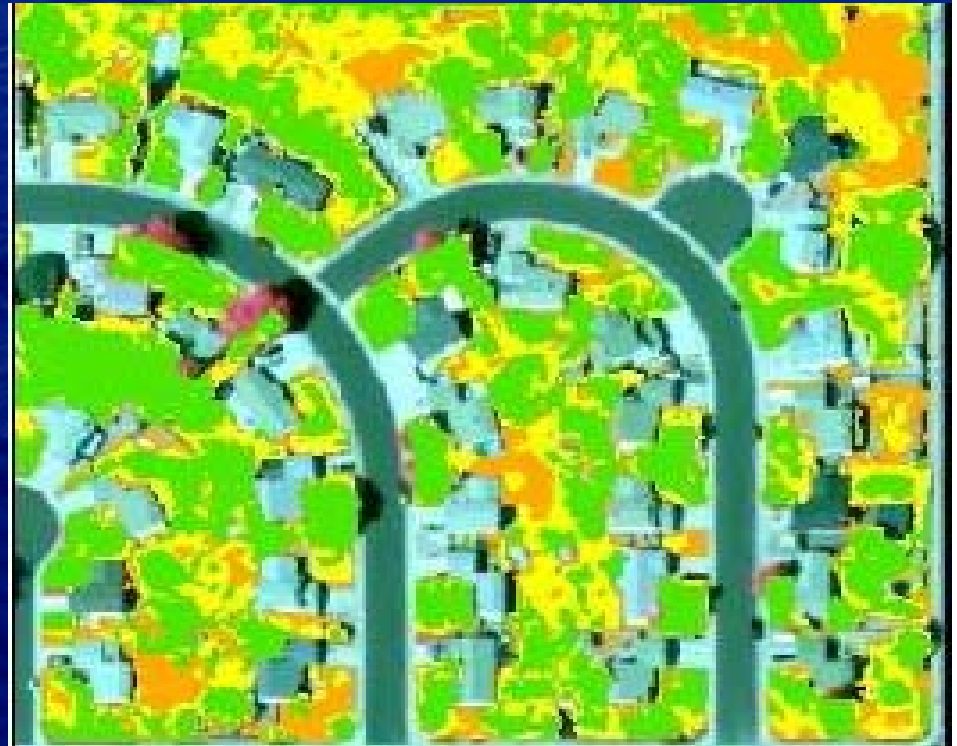
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City Mapping Project

- Create a city wide map for irrigation types
 - High, Medium/Low, or Non-irrigated areas



Irrigated Vegetation

-  High Irrigated
-  Low/ Medium Irrigated
-  Non-Irrigated Vegetation



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Database –Map Link

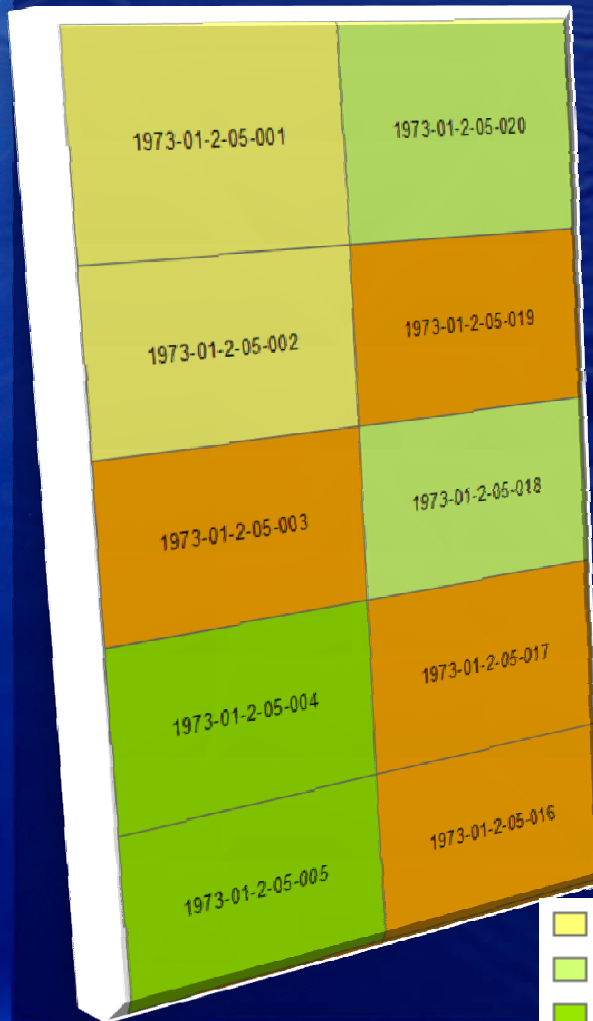
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Very Low
Low
On-Budget
High

- Link water meter data to mapped data
- Create a water use map
 - Linked with customer water meter in GIS
 - Focuses on inefficient water users



Water Use Map (Based on Pilot)

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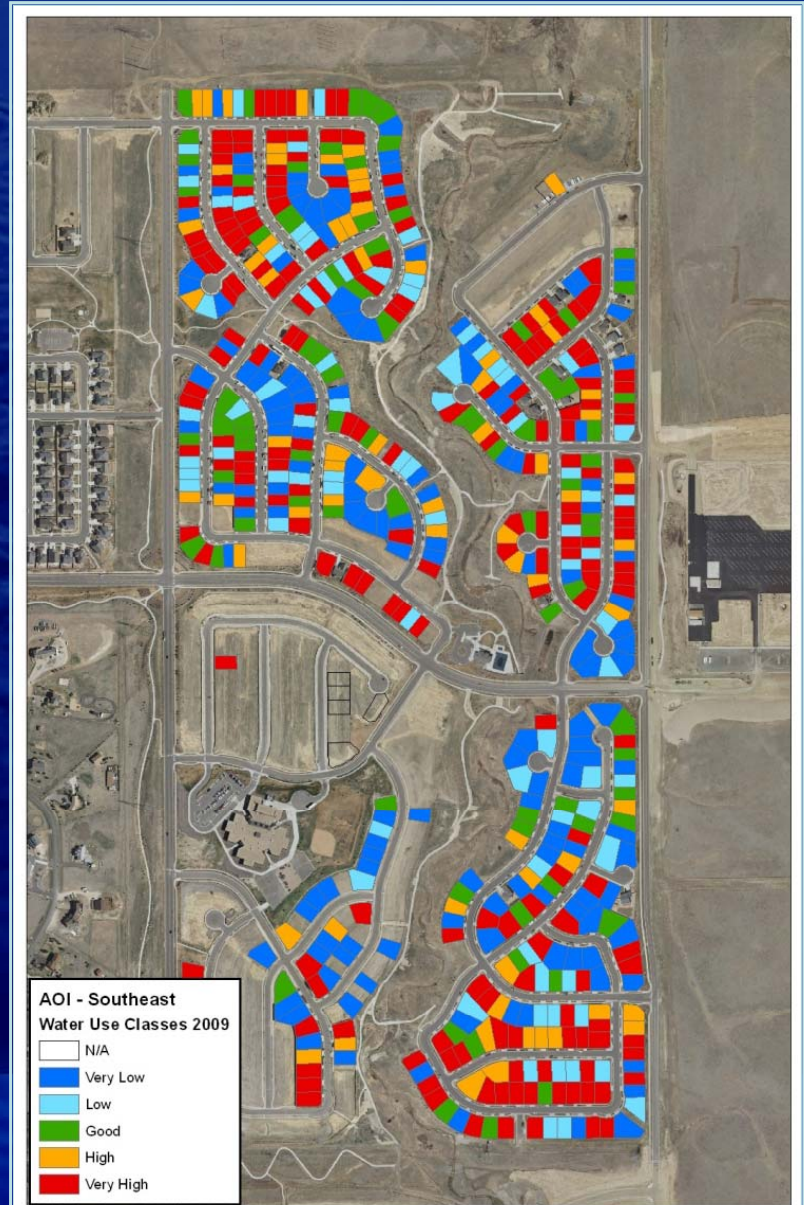
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AOI - Northwest
Water Use Classes 2009

□	N/A
■	Very Low
■	Low
■	Good
■	High
■	Very High

Categories:
Very Low Water Use: <70%
Low Water Use: 70% - 89%
Good Water Use: 90% - 110%
High Water Use: 111% - 130%
Very High Water Use: >130%



AOI - Southeast
Water Use Classes 2009

□	N/A
■	Very Low
■	Low
■	Good
■	High
■	Very High



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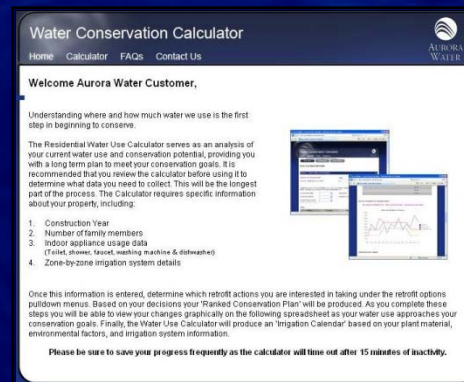
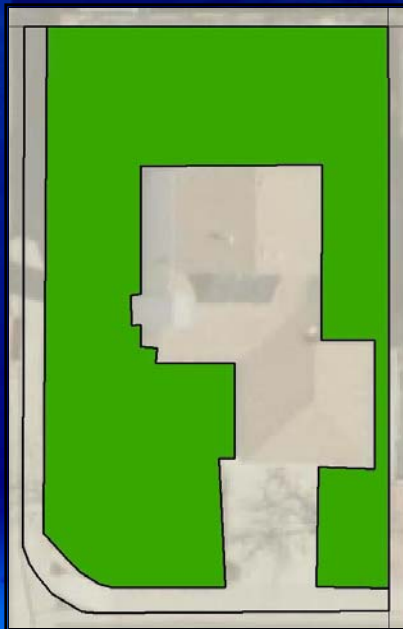


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What's Next...

- Immediate Applications:
 - Add water-budget and conservation savings information directly to monthly water bill
 - City will target the top 200 residential water-wasters for detailed audits



- More informed prioritized list of actions to take.



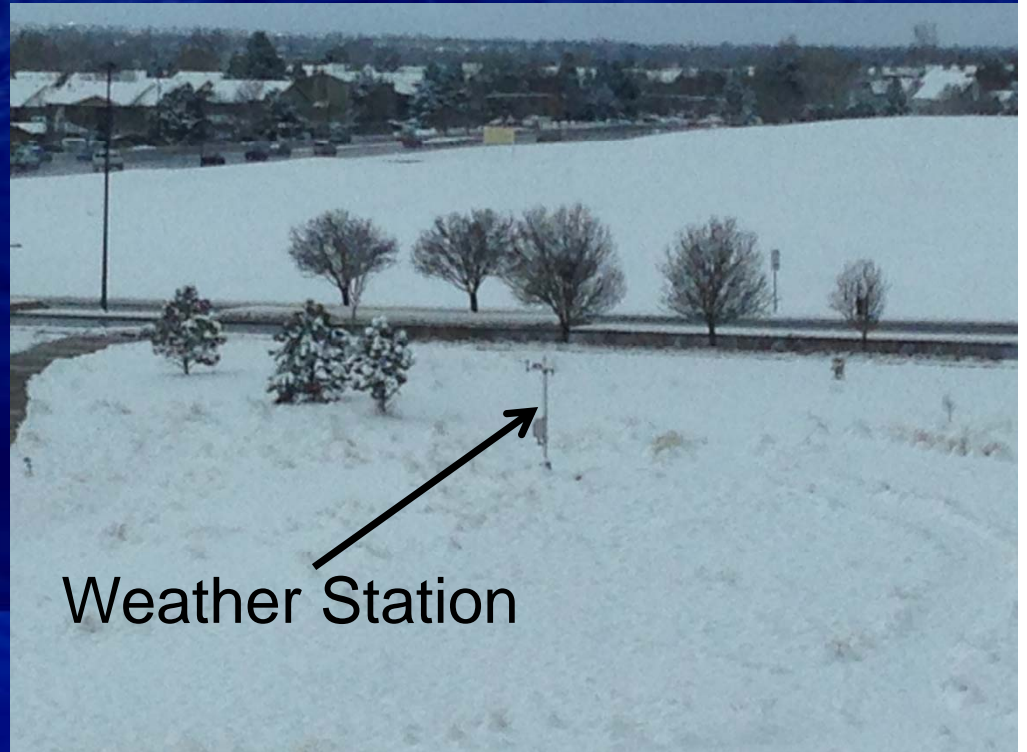
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What's Next...

- Future Refinements / Applications:
 - Add weather data
 - Calculate city-wide efficient water use
 - Trends in future water use
 - Etc.



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Possible Citywide Uses

- City Parks
 - What do they have? Irrigated areas?
- Storm Water
 - Potential billing based on Imp. Surface
- Development Planning
 - Lot trends (P vs. I) throughout city
 - Past vs. Present vs. Potential Trends
 - City ordinances on new development



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