

# PURPLE MOUNTAIN MAJESTIES RUNNING DRY?



# Who Are We?

- **KIP PETERSEN**

- President of the Pikes Peak Regional Water Authority (PPRWA)
- General Manager of Donala Water and Sanitation District

- **WILL KOGER**

- Division Manager for Forsgren Associates, Inc., Colorado Office

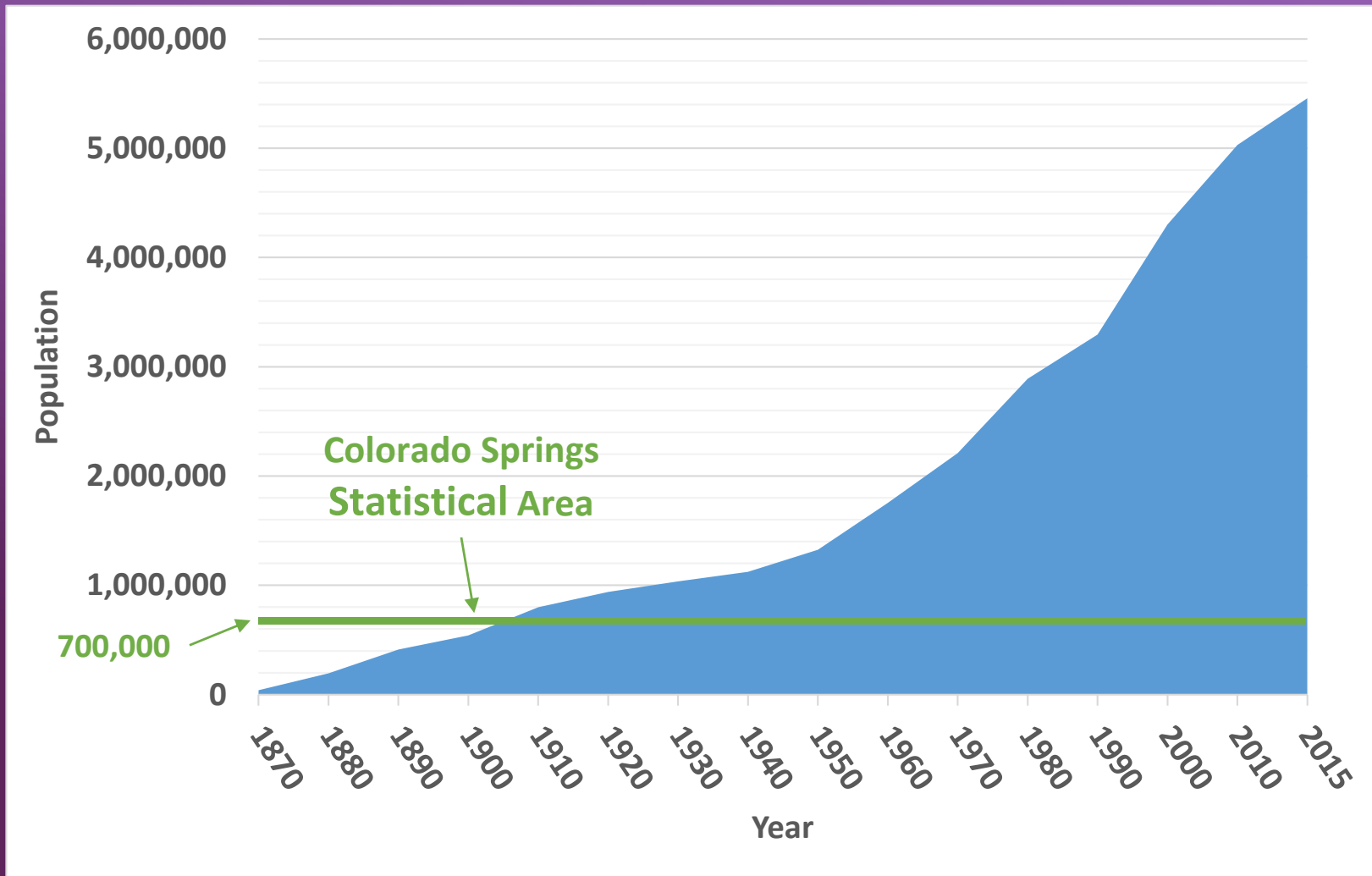


# History of “America The Beautiful” & Pikes Peak

- In 1893, Professor Katharine Lee Bates travelled to the top of Pikes Peak.
- Inspired by the scenery, she penned one of the best-known songs in American history.



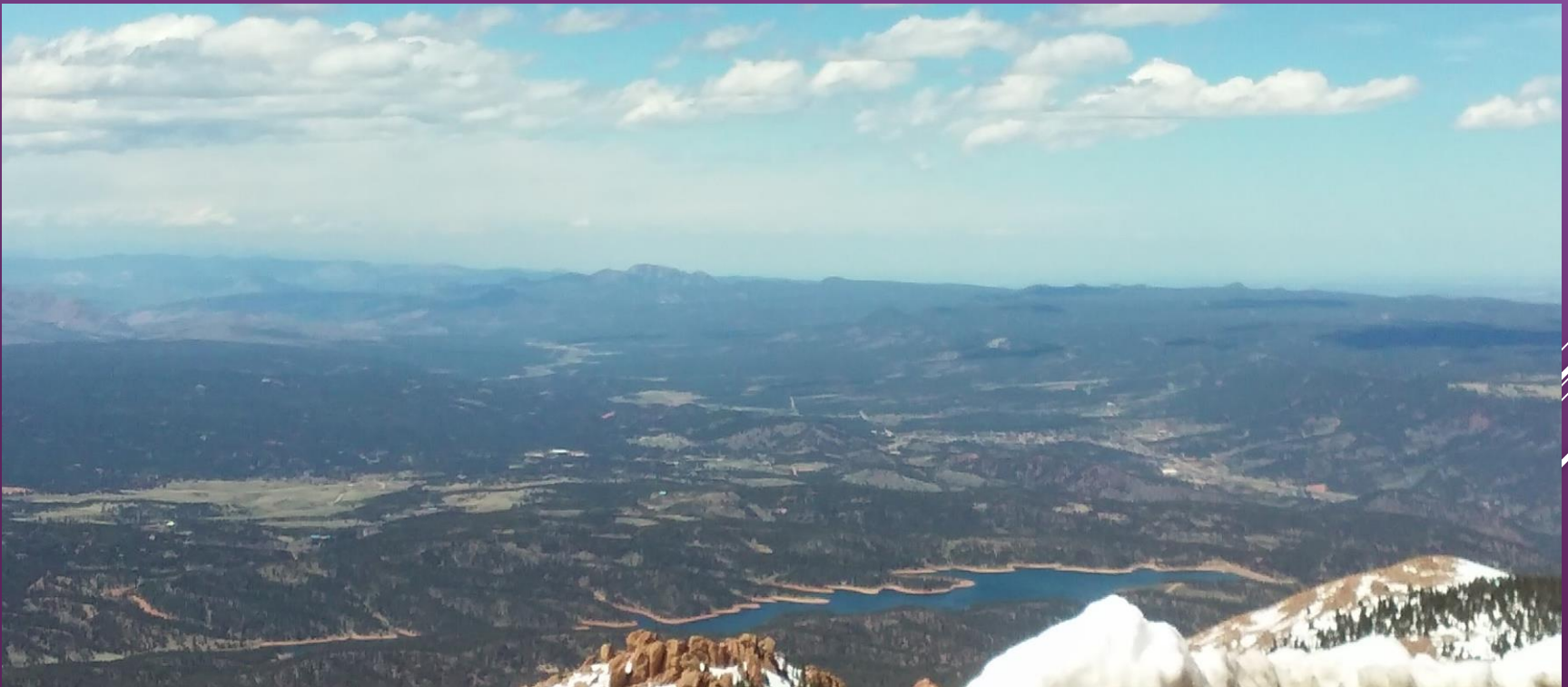
# Colorado Population 1870-2015





# Overview

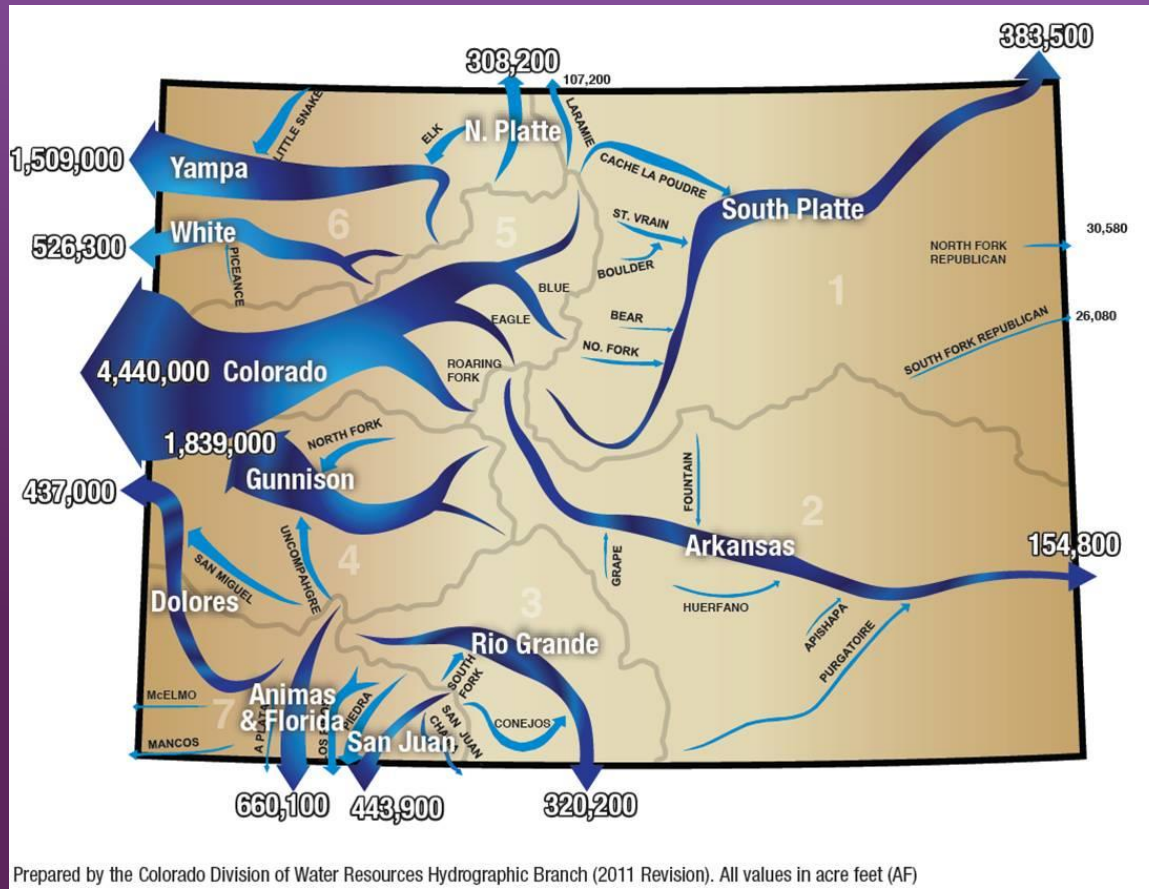
- Colorado Springs Utilities
- Colorado's Water Plan
- PPRWA
- Denver Basin Supply
- Regional Water Planning



# Water

## *"The Divide"*

- 80% population on East Slope



- 80% water on West Slope

# Colorado Springs Utilities Takes the Lead

- Frying Pan – Arkansas Project
- Fountain Valley Authority
- Southern Delivery System





# Pikes Peak Regional Water Authority (PPRWA)

- Water Providers, Monument - Fountain
  - 2008 WIPS (Water Infr. Planning Study)
    - Now updated for larger planning area





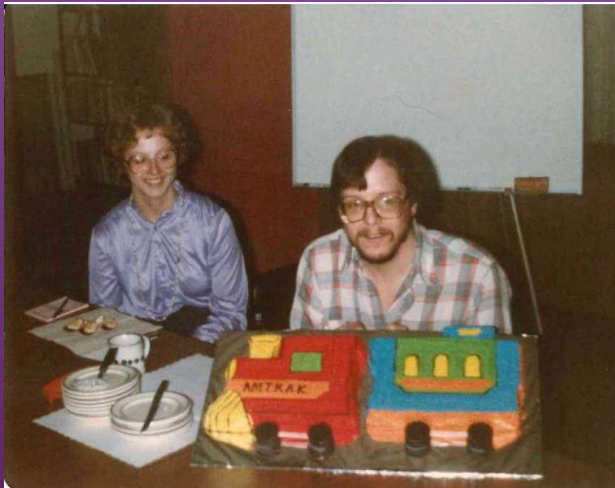
# Colorado's Water Plan

- Population double by 2050?
- S. Platte, Arkansas Rivers over-appropriated
- Projected 500,000 AF gap
- Effects of Climate Change

## ACTION NEEDED



But 2050 is so far off!  
We have plenty of time!



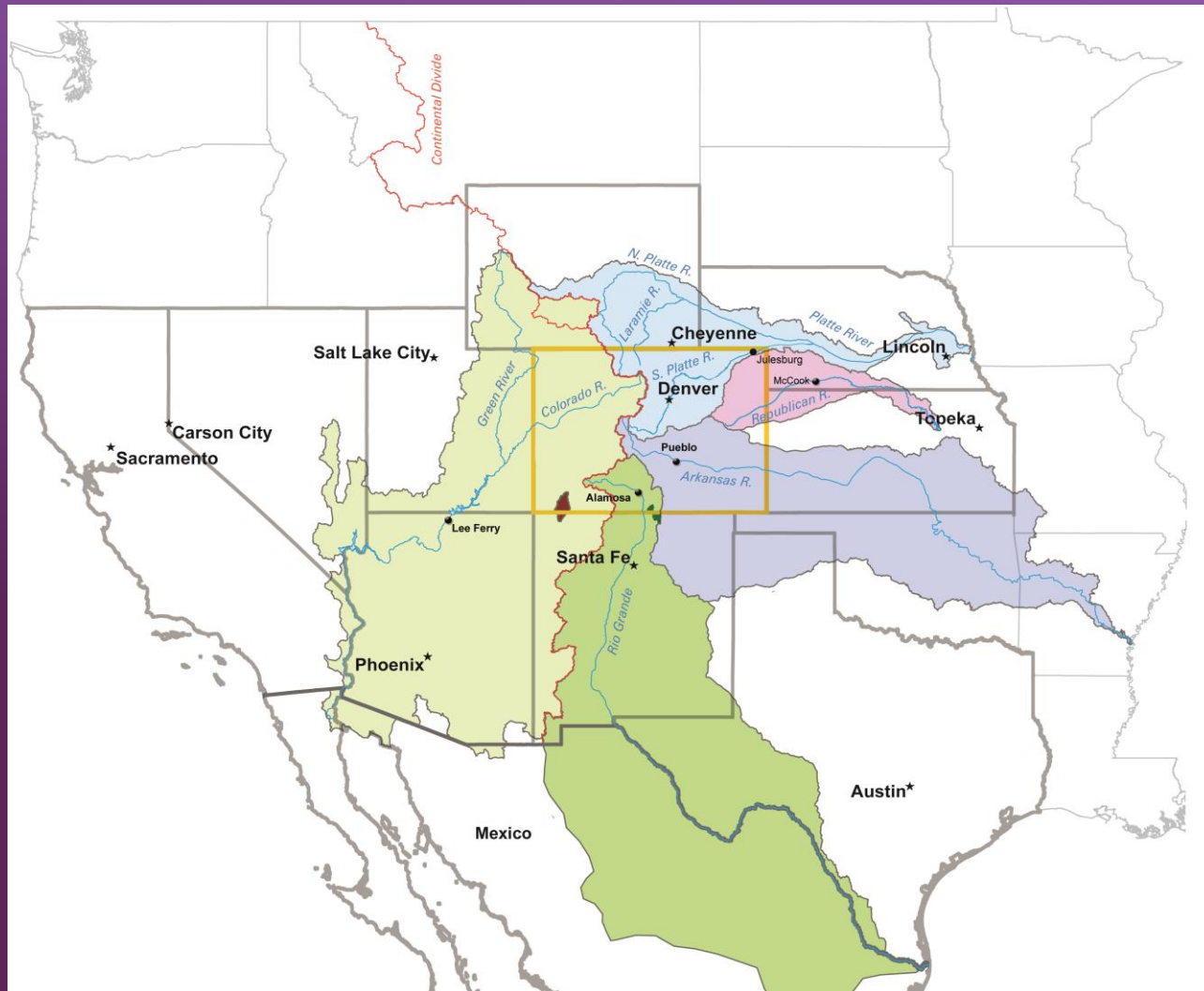
# Denver Basin Supply





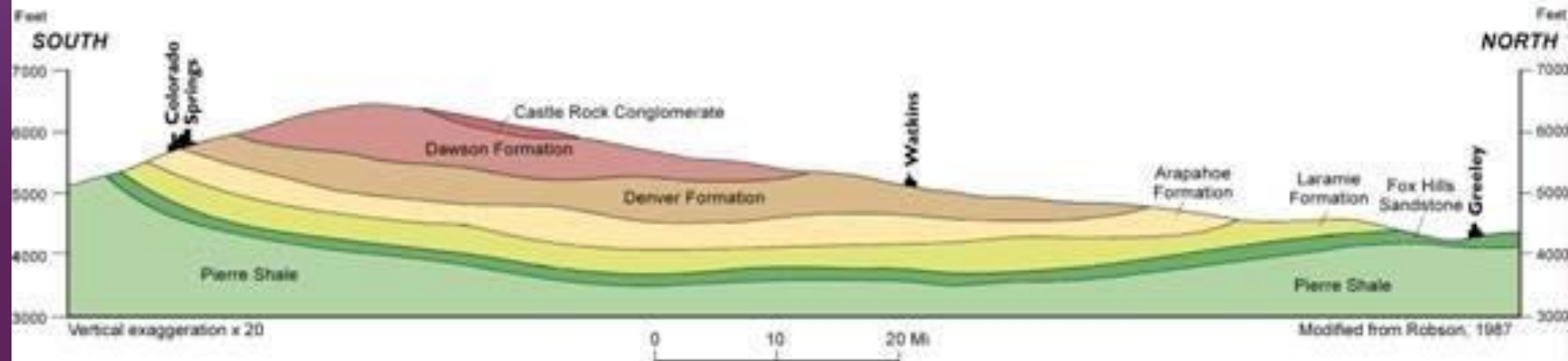
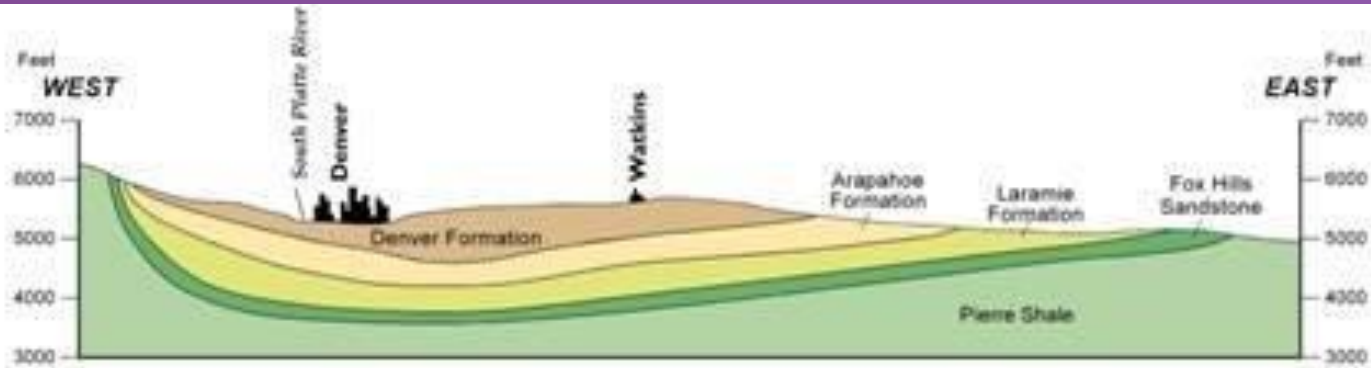
# Colorado Headwaters

- 8 River Compacts
- 19 States & Mexico
- Colorado River Serves 30 M
- ≈ 50 Million by 2050





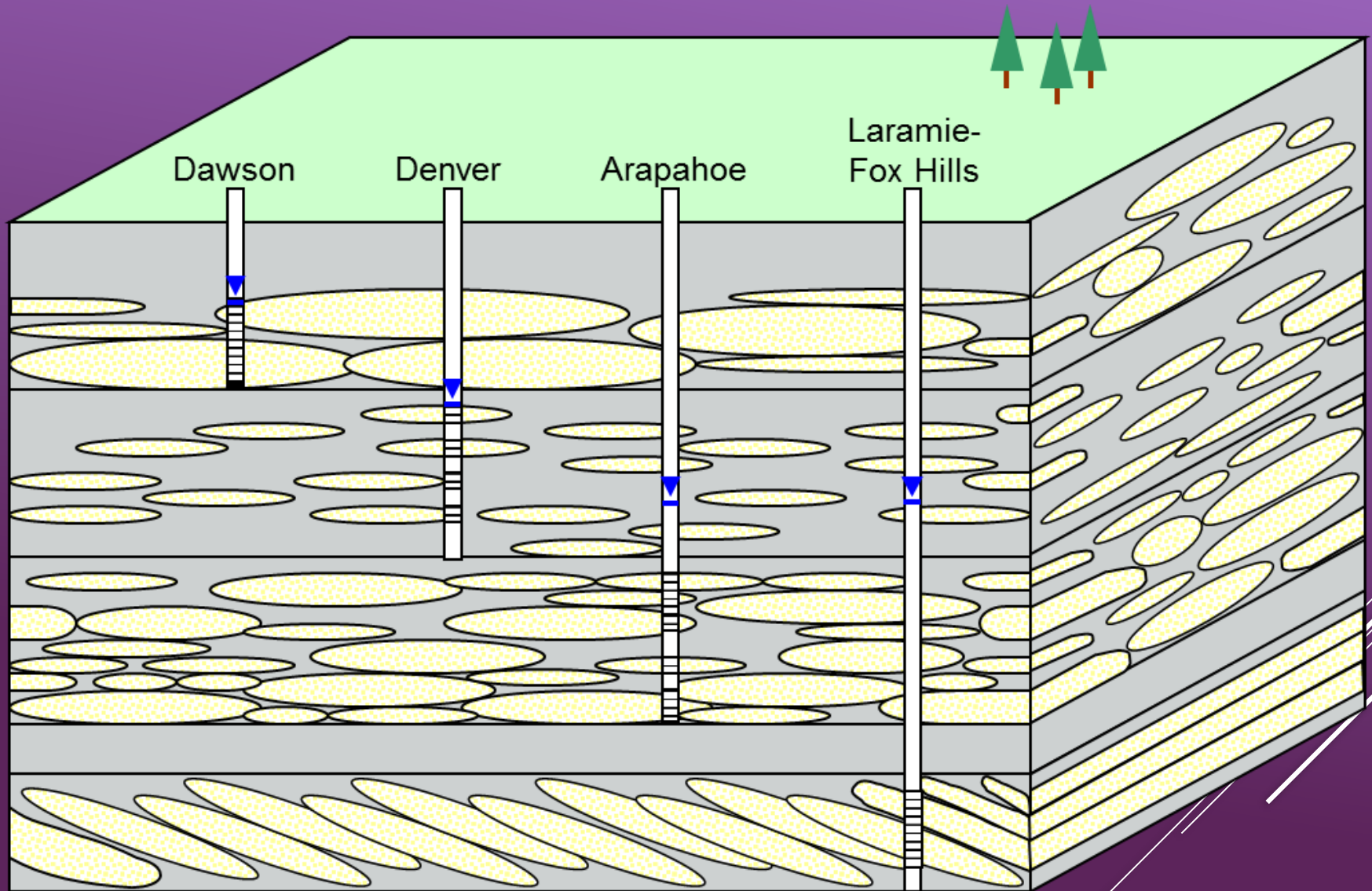
# Denver Basin Supply



# Denver Basin



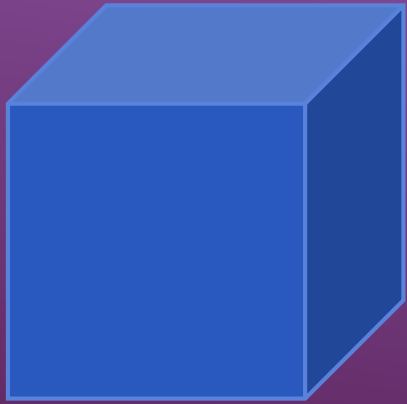
# Denver Basin





# Denver Basin

Water Rights based on volume below property



Volume (State Model)

100 years

= Annual  
Pumping  
Limit

“Paper Water”  
Not Guaranteed





# Denver Basin Aquifers

**Dawson** Domestic, Residential Wells

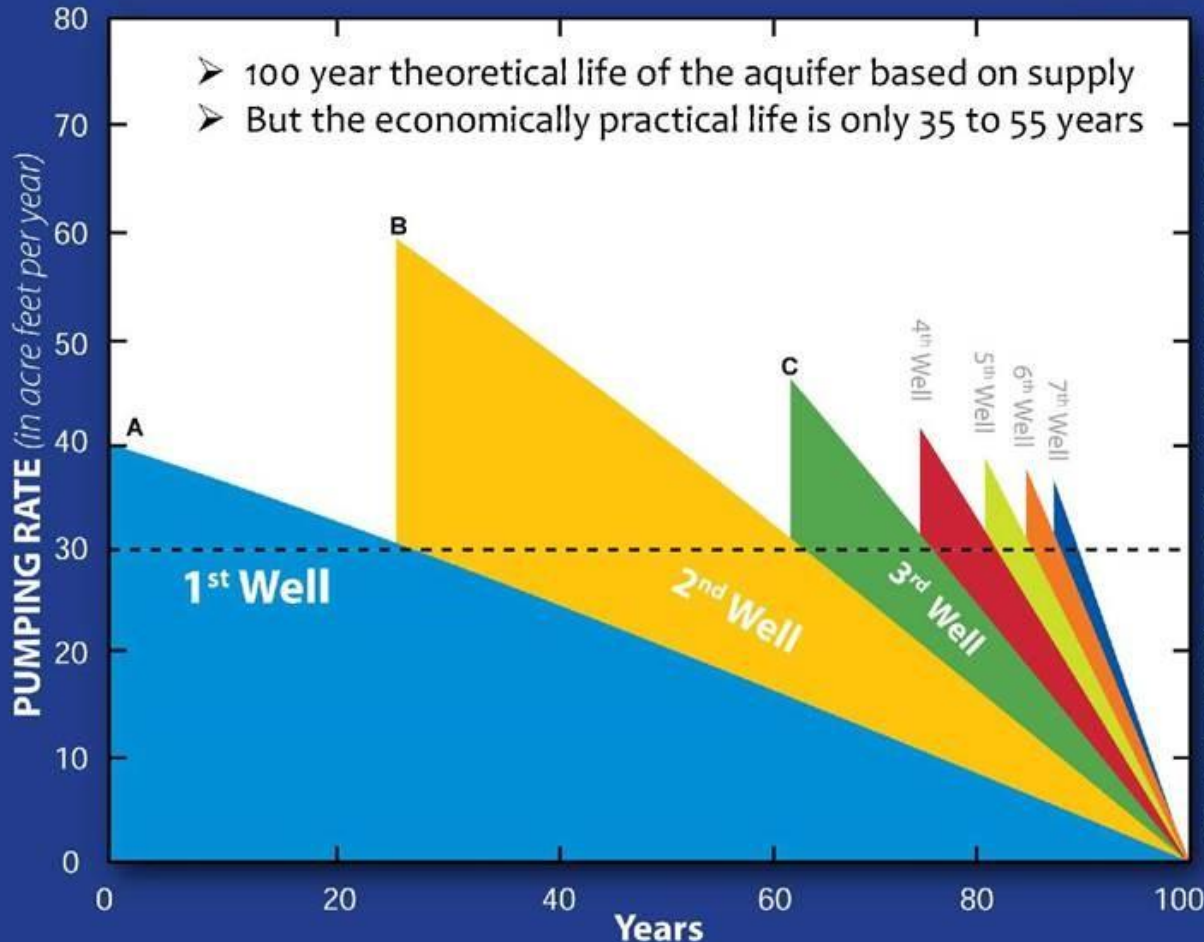
**Denver** • Domestic and Municipal Wells

**Arapahoe** • Municipal Wells, High Production  
• Iron & Manganese  
• Radionuclides

**Laramie – Fox Hills** • Municipal, Low Production  
• Interbedded Coal =  
Taste & Odor  
Radionuclides

# Denver Basin

## CASCADING REDUCTION IN WELL YIELD



Developing Denver Basin Water Rights has a Diminishing Water Return Over Time

# Denver Basin – Well Declines



# Regional Infrastructure Study

- 8 Participants (Includes C. Springs Utilities)
  - M&I Gap (22,600 AF projected in 2008 Report)
    - Transition from Denver Basin Groundwater (Donala WSD)



- Economy of Scale (Saves 30% Each)
  - Water Rights Not Included
  - Opens the Door for More Cooperation



# Denver Basin Assumptions

- Supply Diminishing, Not Sustainable
- Assumptions
  - 2035 - 35% of Supply Economical
  - 2050 - 0% No Economical Use



# PPRWA Water Supply Gap

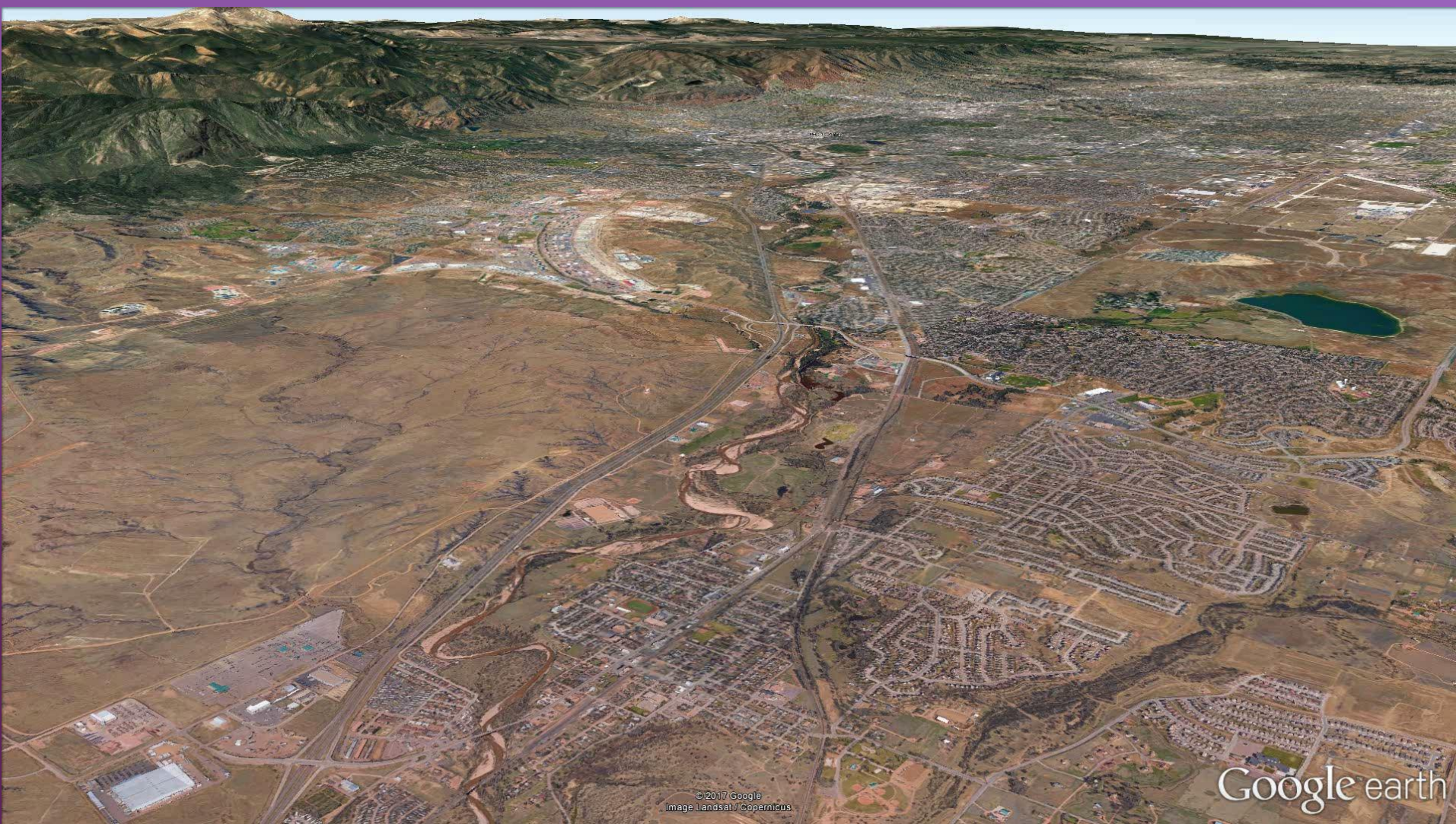
## ***Study Participants - Projected Supply and Demand***

	Current	2035	2050
Supply (Non-Renewable)	14,566	4,874	0
Supply (Total)	35,129	25,437	20,563
Demand	16,284	25,024	29,960
Supply Deficit (Surplus)	<b>18,845</b>	<b>413</b>	<b>-9,397</b>

# Break for Questions & Discussion



# Google Earth Fountain to Monument

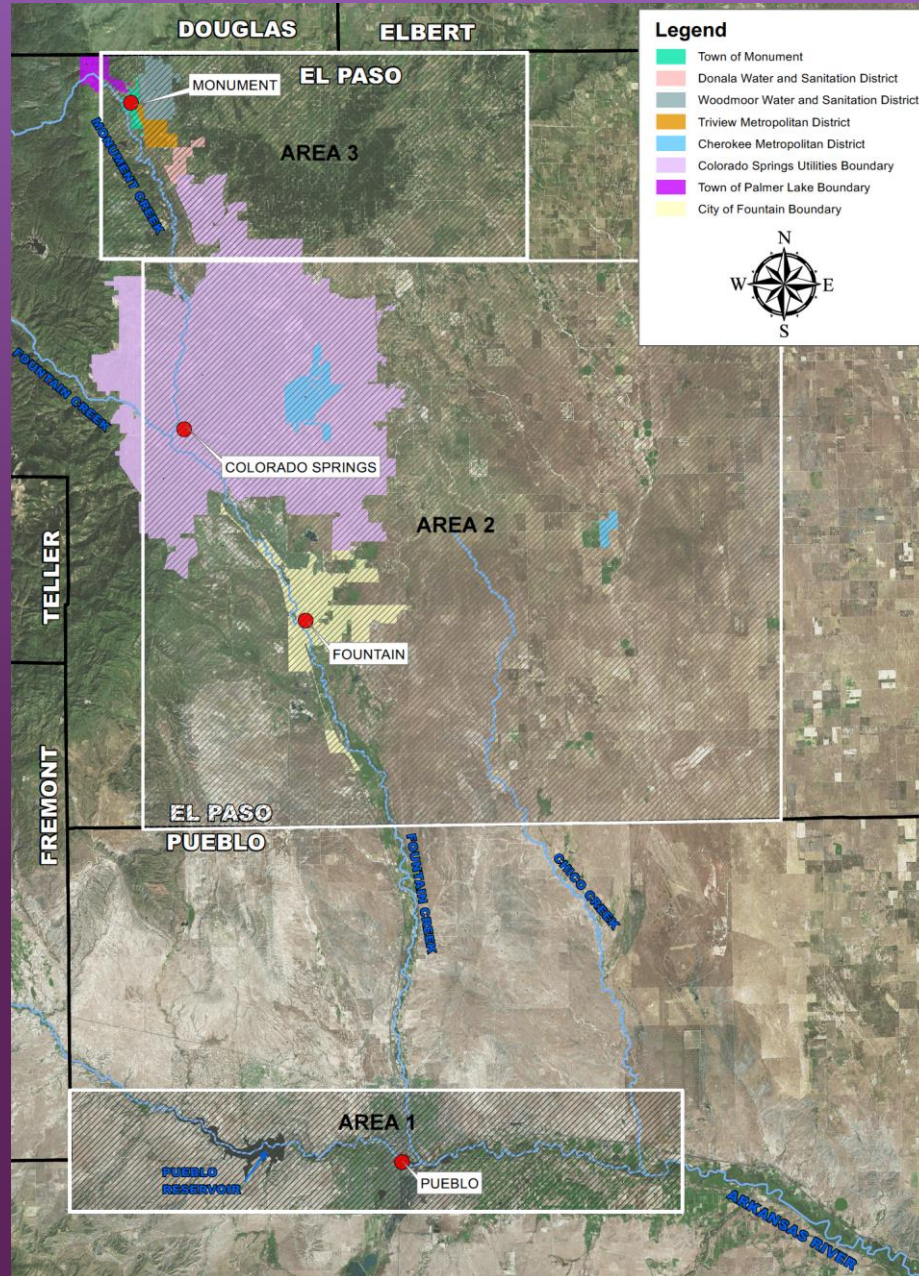


©2017 Google  
Image Landsat / Copernicus

Google earth

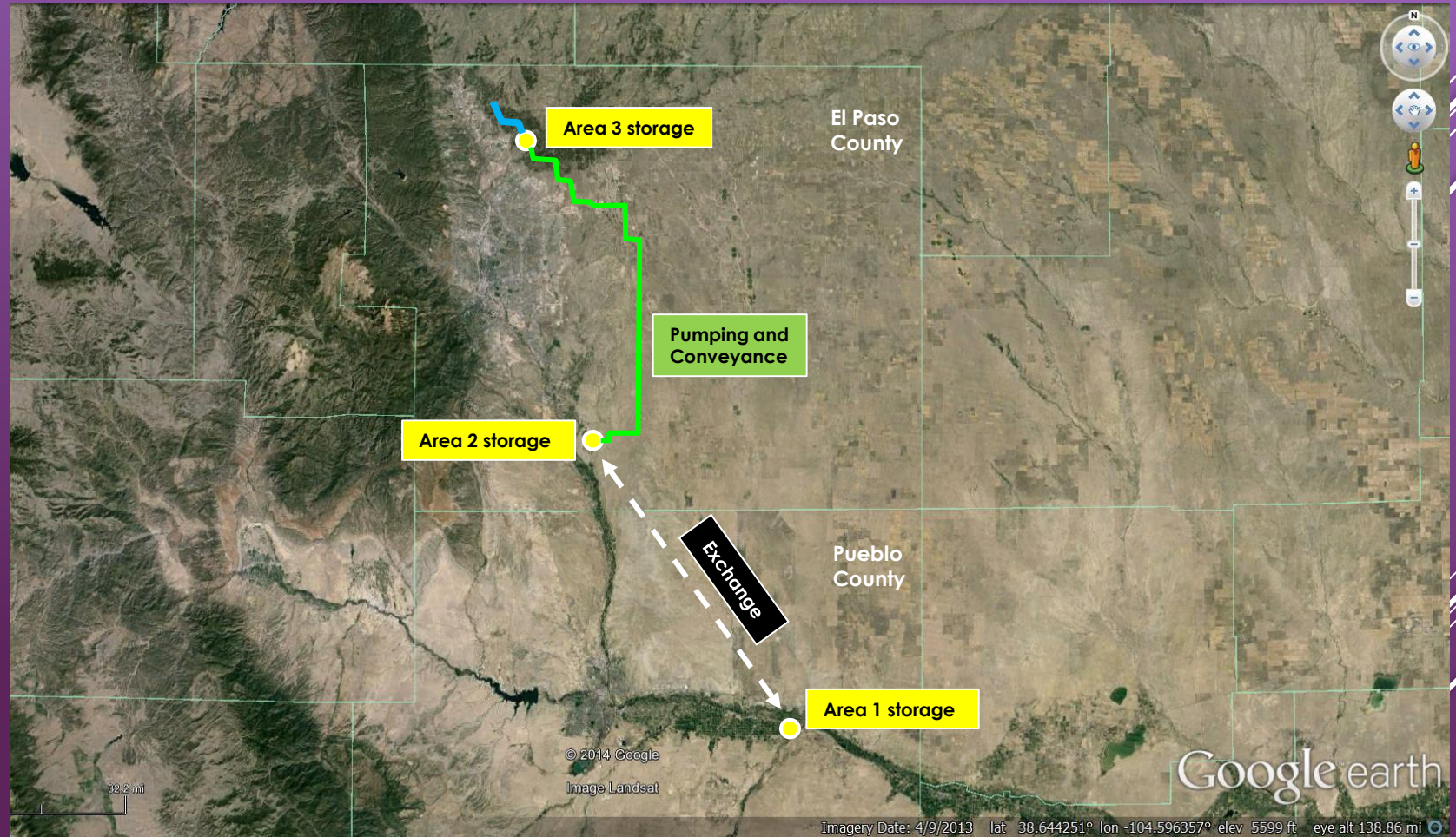


# New System Overview





# System Overview



# Cost & Timeline Implementation - \$280M

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Complete Regionalization Study														
Preliminary Engineering-Area 3														
Develop Governance														
Secure Funding														
Environmental Compliance / Permitting-Area 3														
Detailed Design-Area 3														
Construction-Area 3														
Start-Up and Commissioning-Area 3														
Secure Funding														
Preliminary Engineering-Area 2														
Environmental Compliance / Permitting-Area 2														
Detailed Design-Area 2														
Construction-Area 2														
Start-Up and Commissioning-Area 2														
Secure Funding														
Water Rights Acquisition														
Water Court Change of Use Decree														
Water Court Exchange Decree														
Secure Funding														
Preliminary Engineering-Area 1														
Environmental Compliance / Permitting-Area 1														
Detailed Design-Area 1														
Construction-Area 1														
Start-Up and Commissioning-Area 1														

# Area 3 Goals

- Use current supplies efficiently
  - Network for renewable water delivery



- Renewable Water Needs
- Costs and Timeline
- Next Steps



# Solutions

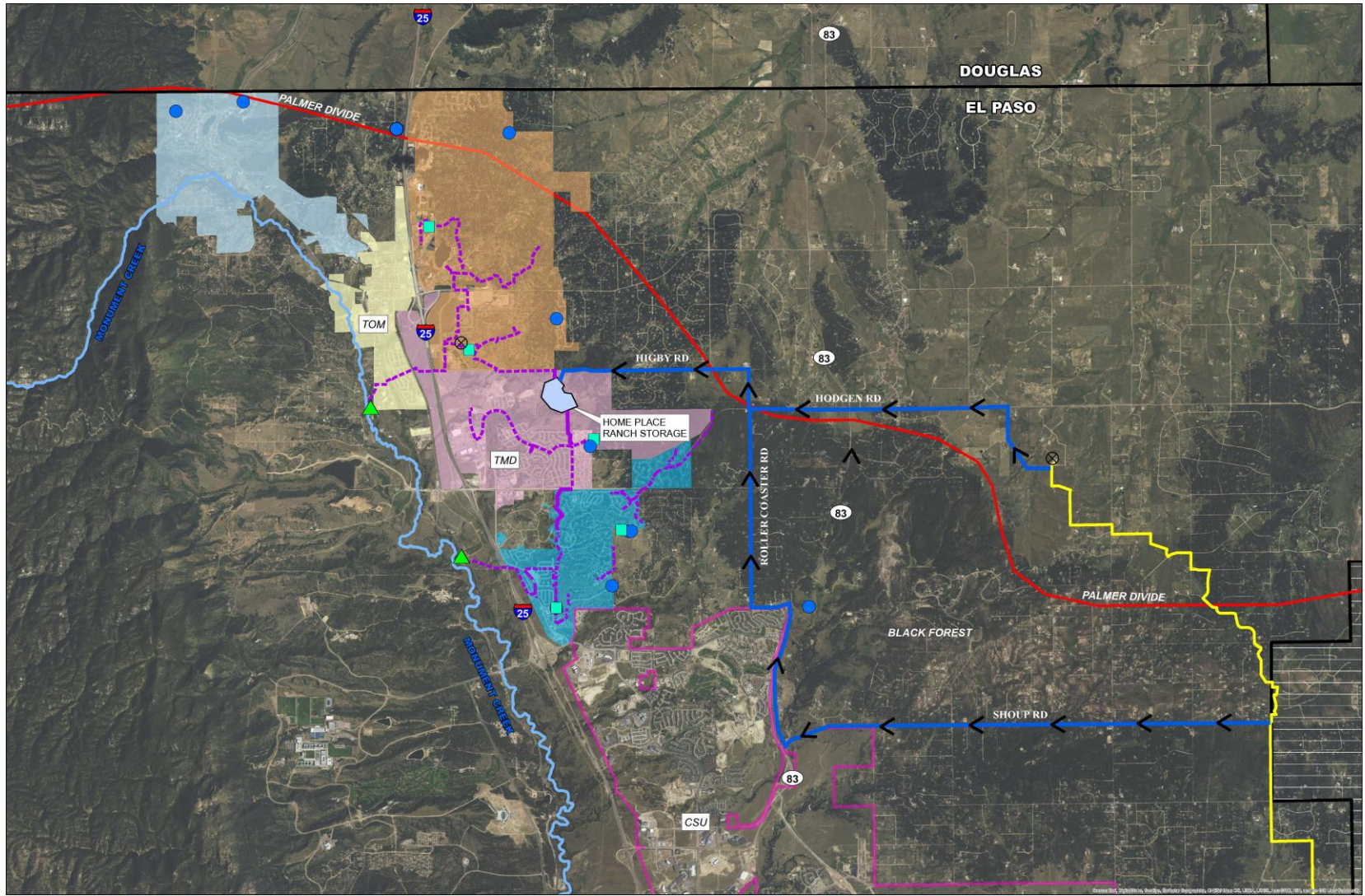
- **ASR – Aquifer Storage and Recovery**
- **Reuse Water**
- **Reservoir Storage**
- **Alluvial Storage**



- **Existing Piping**
- **Proposed Alignments**
- **Renewable Water**



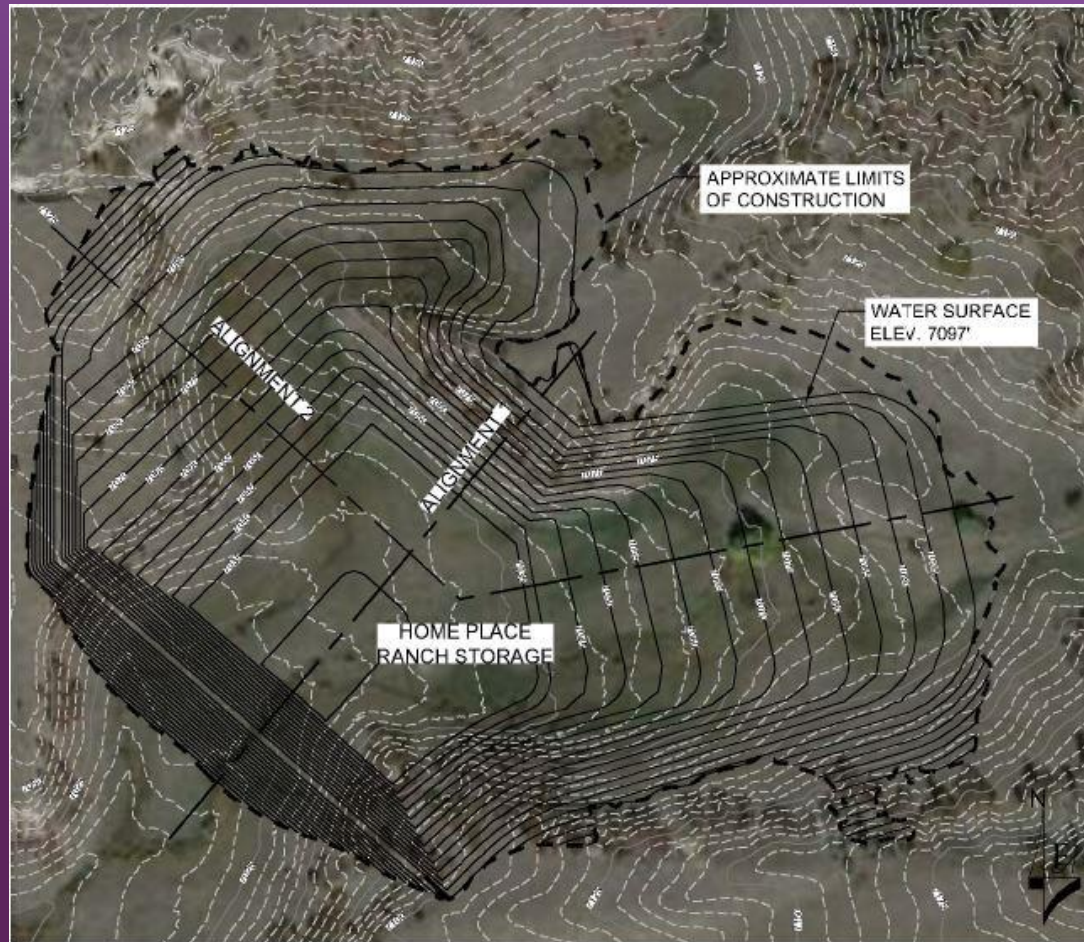
# Area 3 System Overview





# Area 3 Home Place Ranch Reservoir Site

- Storage = 2750 AF
- Area = 86 Ac
- Cost = \$20.5M
- \$7500/AF of storage



# Area 3 Renewable Water

- Need 8,600 AFY
- Currently have access to 209 AF connected + 280 AF from upper Arkansas River (via CSU)

## Newly Acquired:

- FMIC shares – 350 AFY (Triview MD)
- Laughlin Ditch shares = 324 AFY (Donala WSD)





# Area 3 Costs & Timeline

Participant	2050 Avg. Annual Demand AFY	Current Renewable Water Supply Connected to System (AFY)	Area 3 Total Costs
Town of Palmer Lake	234	134	\$650,000
Town of Monument	870	75	\$5,160,000
Woodmoor Water and Sanitation District	2,628	-	\$17,060,000
Triview Metropolitan District	3,100	-	\$20,120,000
Donala Water and Sanitation District	1,760	-	\$11,420,000
<b>Total =</b>	<b>8,592</b>	<b>209</b>	<b>\$54,420,000</b>
<b>Cost = \$6,500/AF</b>		<b>Timeline = 5 – 10 years</b>	

# Area 3 Next Steps

- Reservoir is the Key Facility
- CWCB loan
- Governance structure
  - Grant/local funding by participants
  - Permitting (Mouse, Wetlands, Dam)
  - Capital Expenditure Plan – Phasing



# Challenges

- Funding
- Lengthy Schedule
- Political Support
- Many Players
- Continuity & Vision





# Questions

