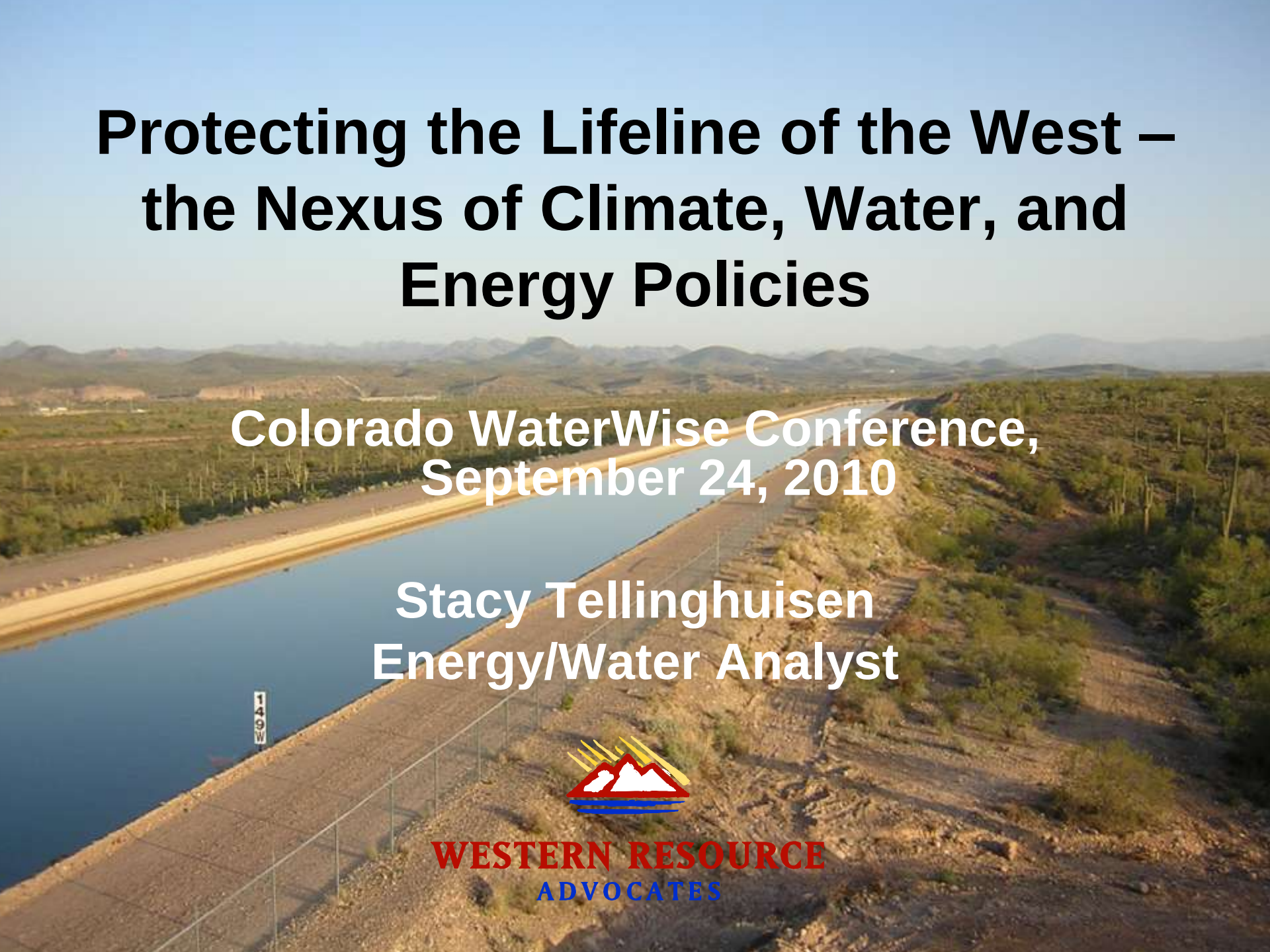
Protecting the Lifeline of the West – the Nexus of Climate, Water, and Energy Policies



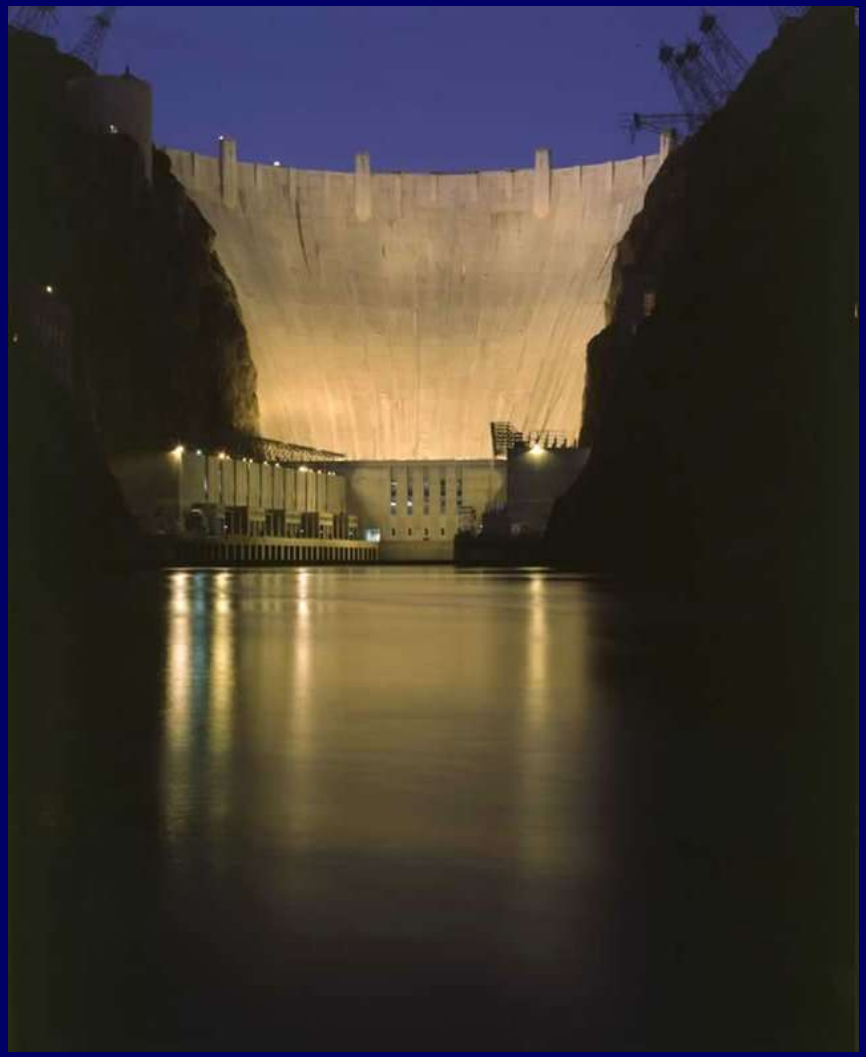
Colorado WaterWise Conference, September 24, 2010

Stacy Tellinghuisen
Energy/Water Analyst

WESTERN RESOURCE ADVOCATES

Outline

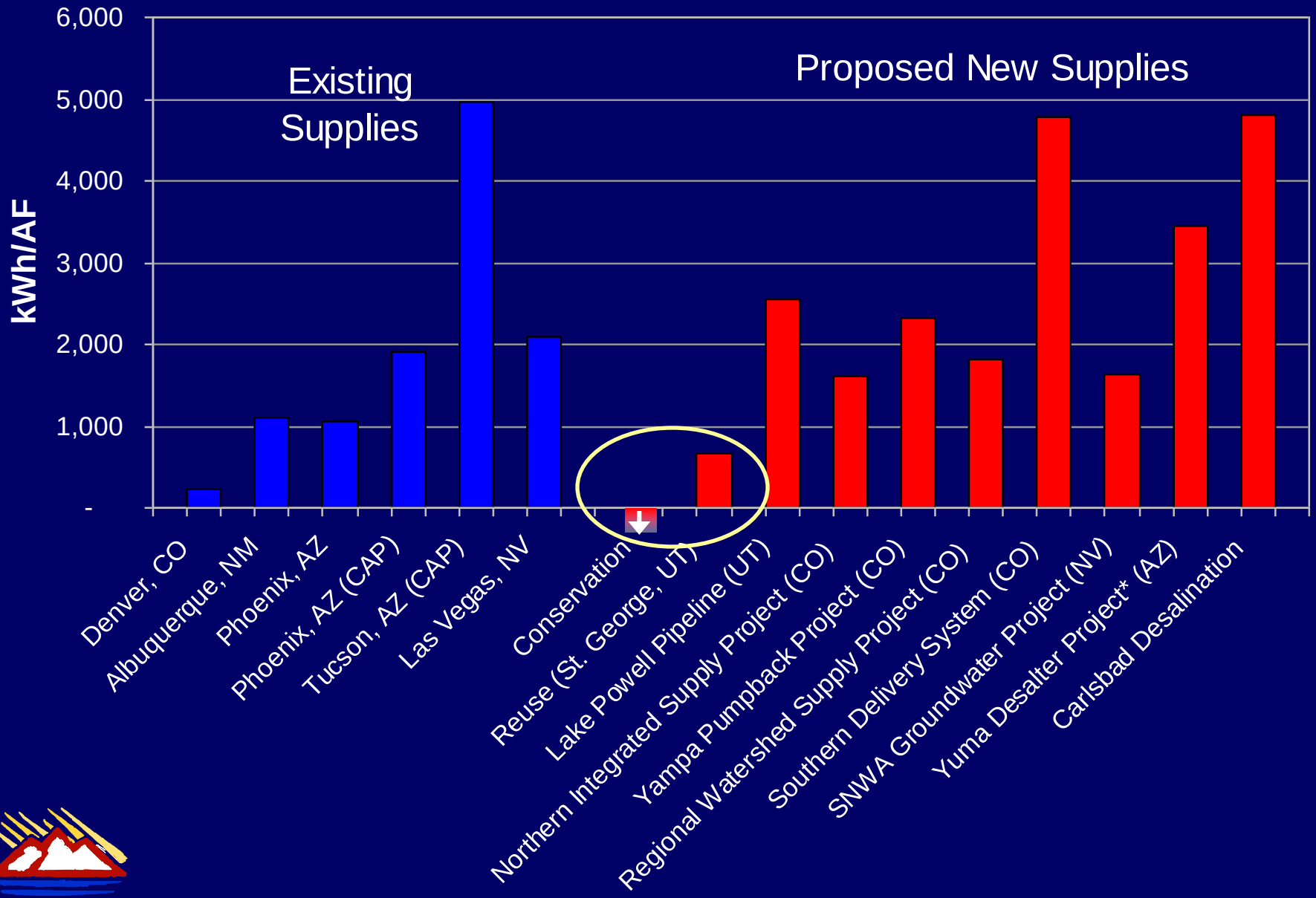
- Energy used for water
  - Proposed water projects
  - Energy savings of water conservation measures
- Water used for energy
  - Electricity
  - Transportation fuels



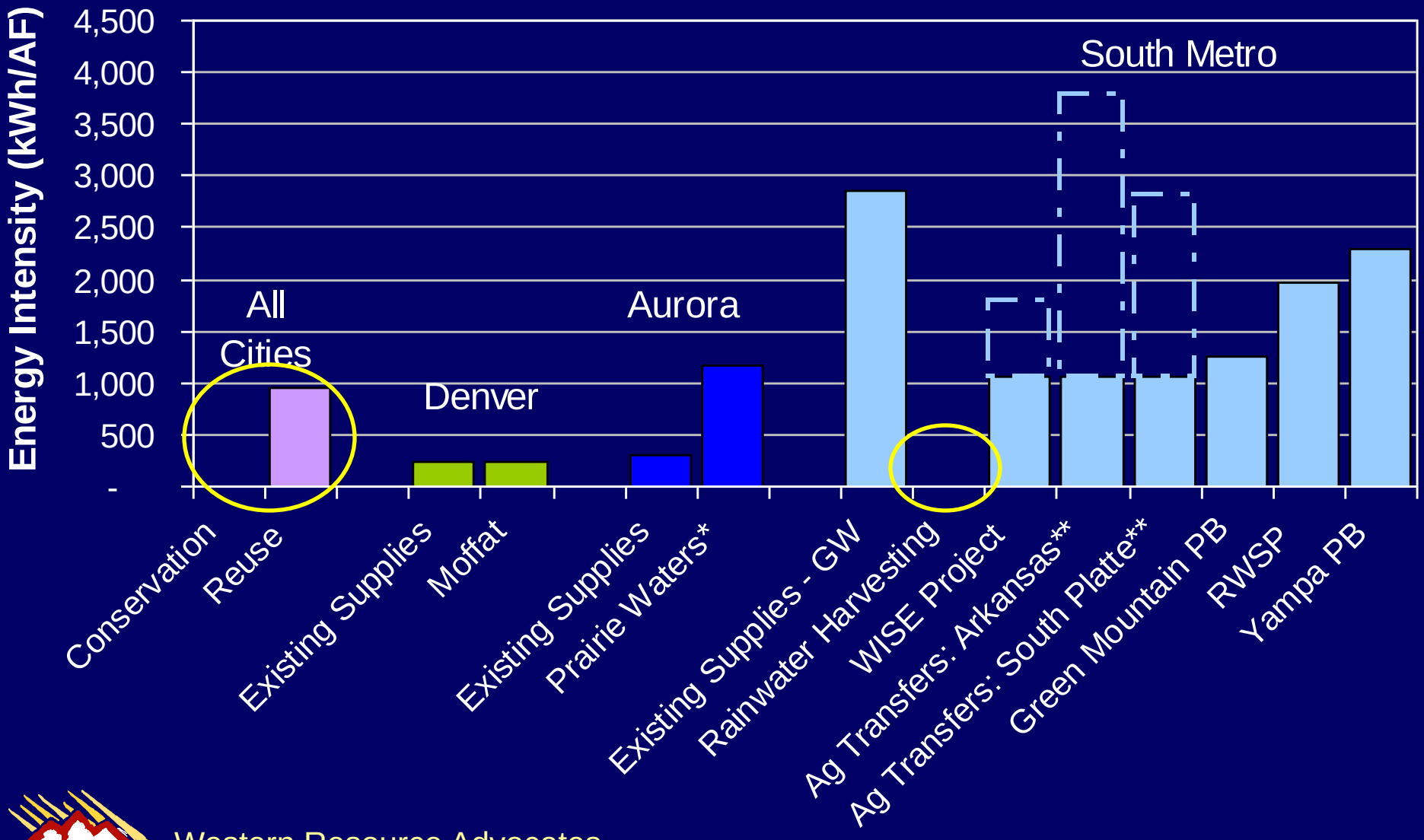
Proposed Water Supply Projects

Western Resource Advocates

Energy Intensity of Water

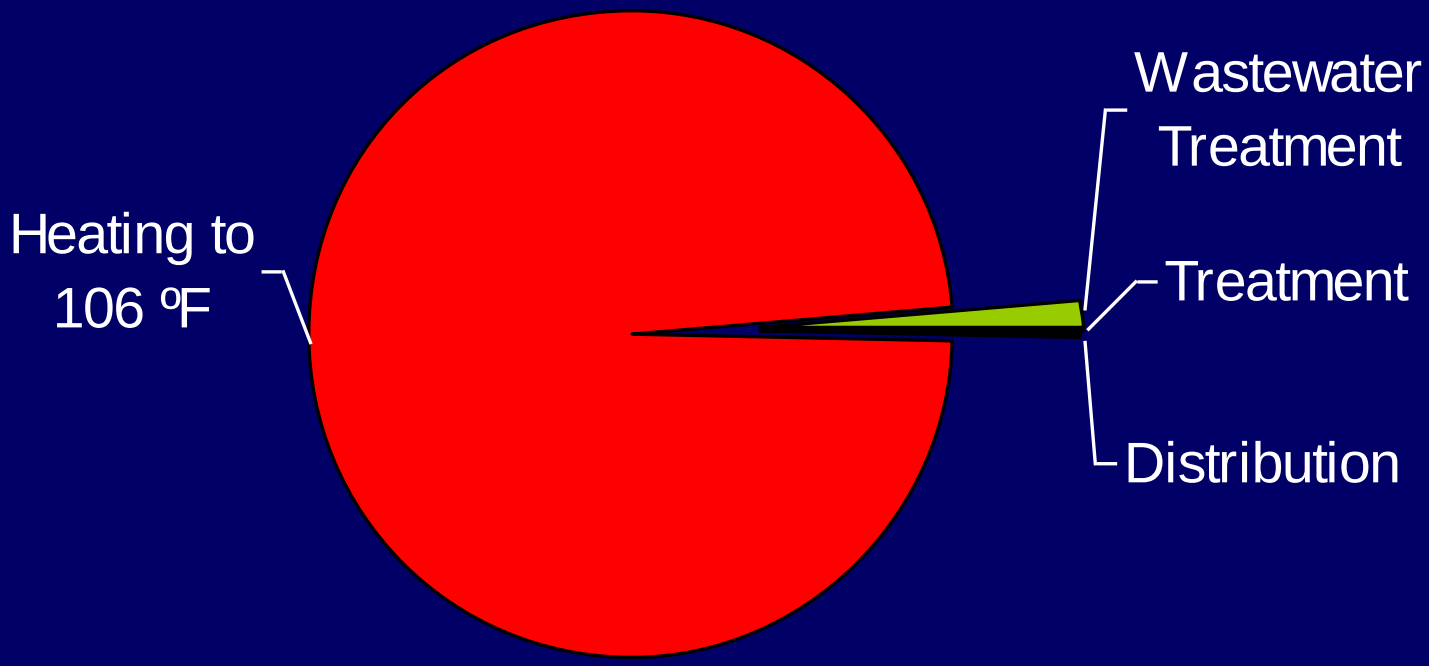


Denver-Metro Region: Energy Intensity of Existing and Proposed Supplies



Western Resource Advocates

Energy Intensity of Water: Denver, CO



Saving Water & Energy

Conservation Programs

SNWA's "cash for grass" program saves

- 77,000 AF/yr
- 160,000 MWh/yr
- 86,300 tons CO_2/yr

Albuquerque's conservation program has *cumulatively* saved

- 417,000 AF
- Est. 973,000 tons of CO_2

Can we do more??

Western Resource Advocates

New Opportunities?

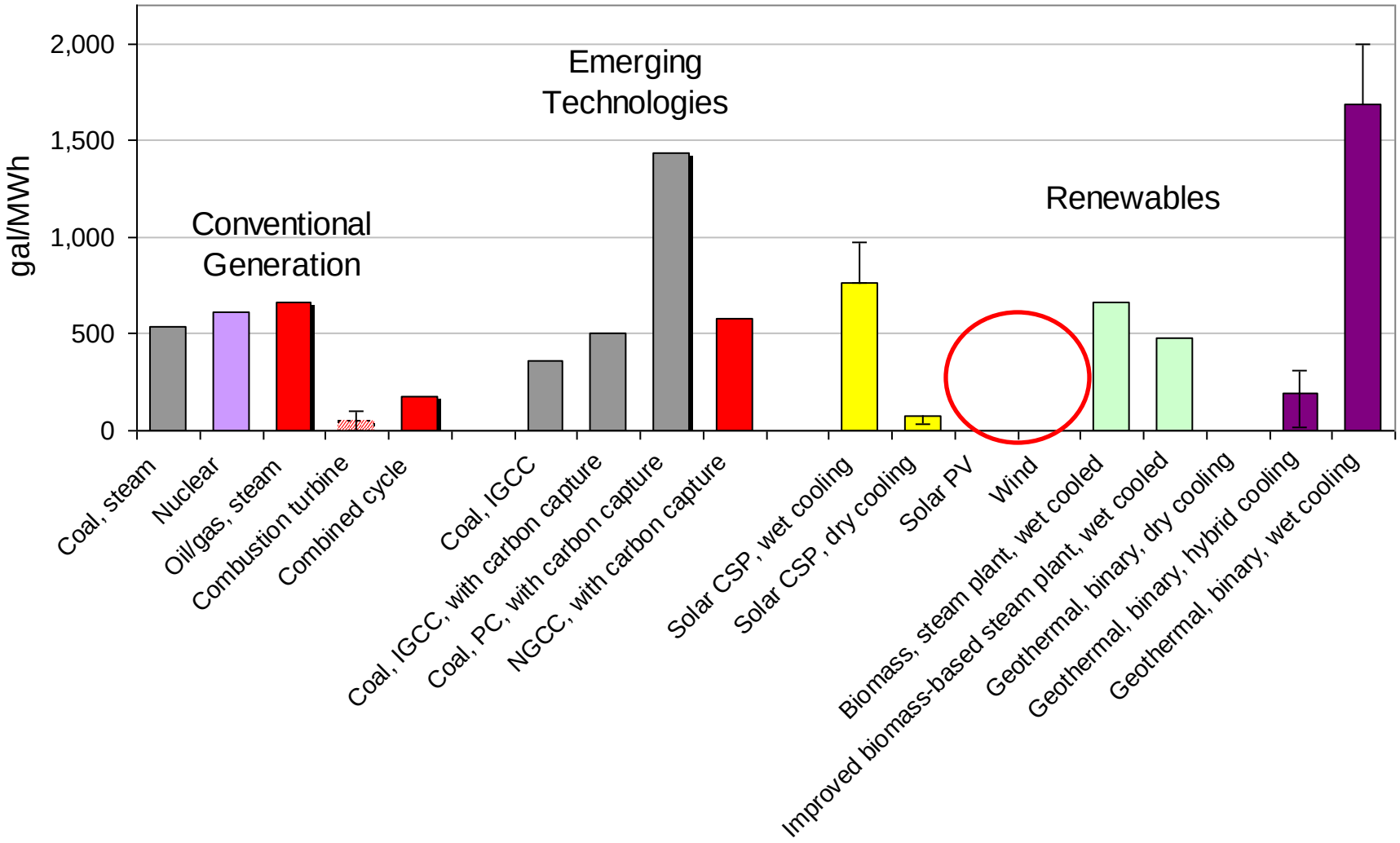
- ✓ Are there new ways to promote water conservation?
  - ➢ State/local climate planning agencies
  - ➢ Energy utilities
  - ➢ Colorado Carbon Fund

Water Use for Energy

Thermoelectric power plants in Arizona, Colorado, New Mexico, Nevada, and Utah consumed an estimated 292 million gallons of water a day in 2005 – equal to the water consumed by Denver, Phoenix, and Albuquerque, combined.

Western Resource Advocates

Water Intensity of Electricity Generation



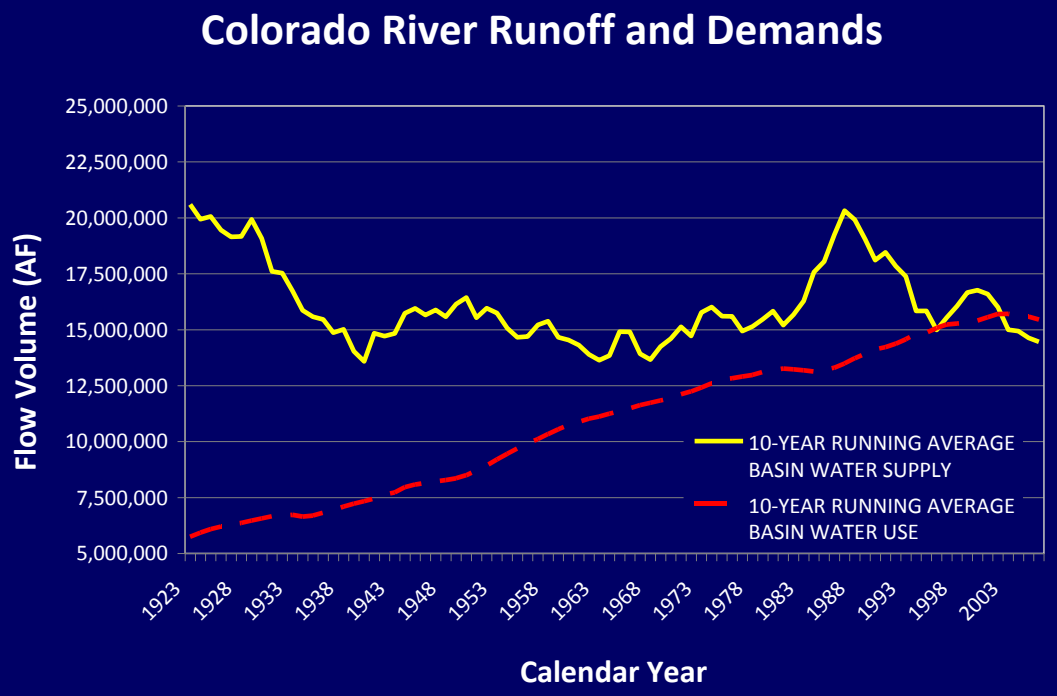
Coal Nuclear Natural Gas Solar Wind Biomass Geothermal

Western Resource Advocates

Colorado River Basin – Water Impacts of Energy Generation

- New Upper Basin municipal water projects will increase water withdrawn from the river.
- At mid-century, 23 out of 24 climate models project decreases (on the order of 5 – 20%) in runoff in the Upper Colorado.

zero sum game?



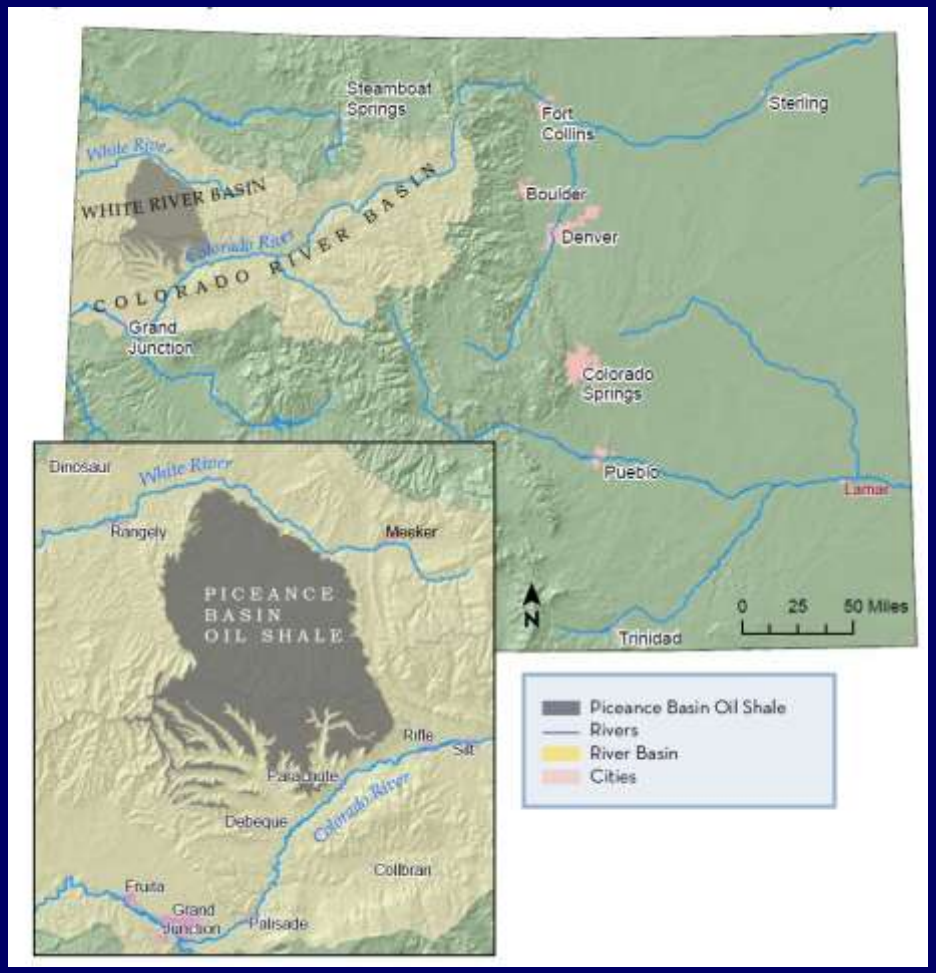
Source: Bureau of Reclamation

Existing Energy-Related Water Demands: Colorado River

Colorado River water use: 167,000 AF/yr

Additional in-basin water use for power generation: 170,000 AF/yr

New Demands – Oil Shale?



"Any large transfer of water to oil shale would shift the West Slope from an agricultural landscape to an industrial one" – *Chris Treese, CRWCD*

Western Resource Advocates

Water Use: Oil Shale

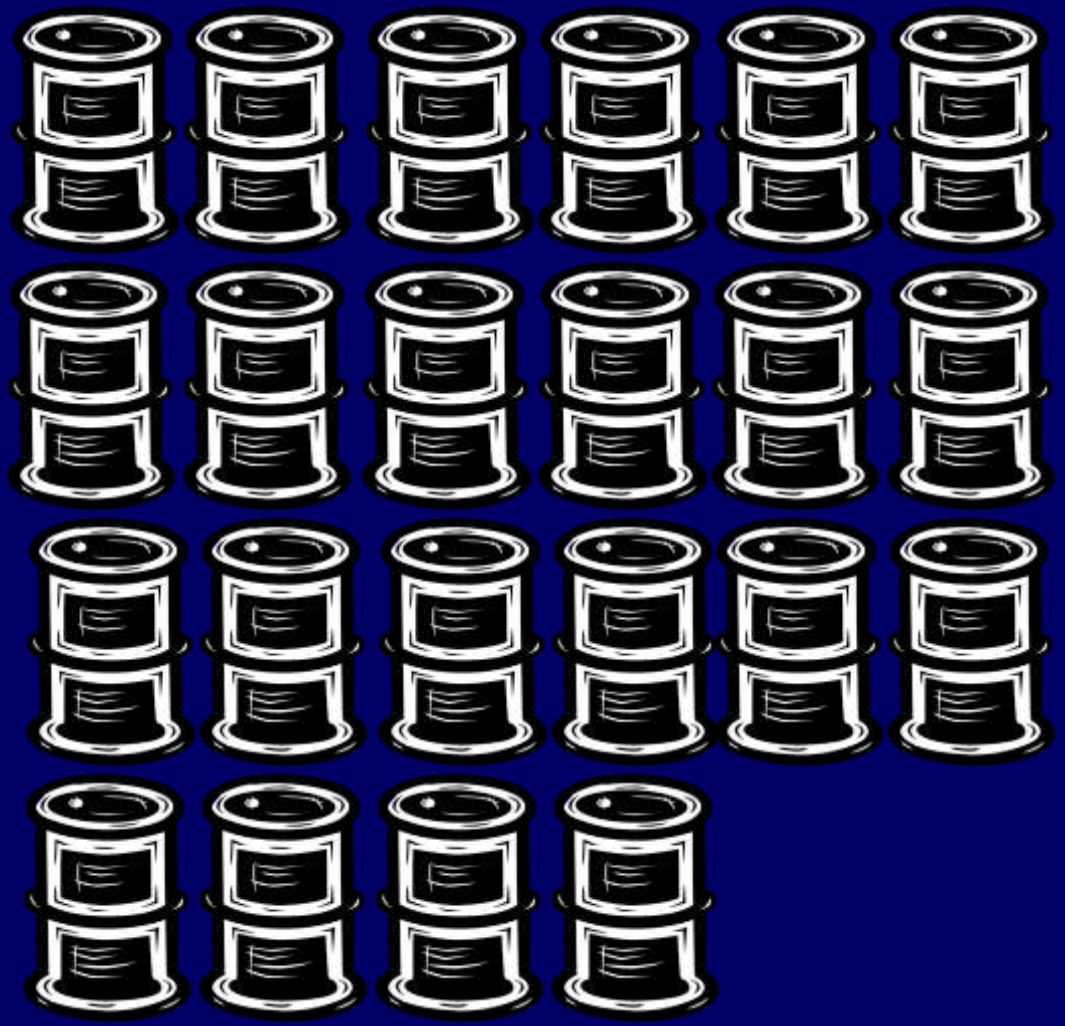
1 Barrel of Oil

=

Mining/ Retort

2 – 5 Barrels

Upgrading? 22 Barrels



Western Resource Advocates

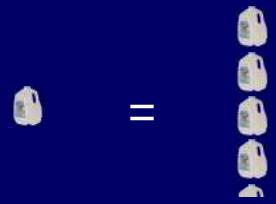
Water Use: Ethanol

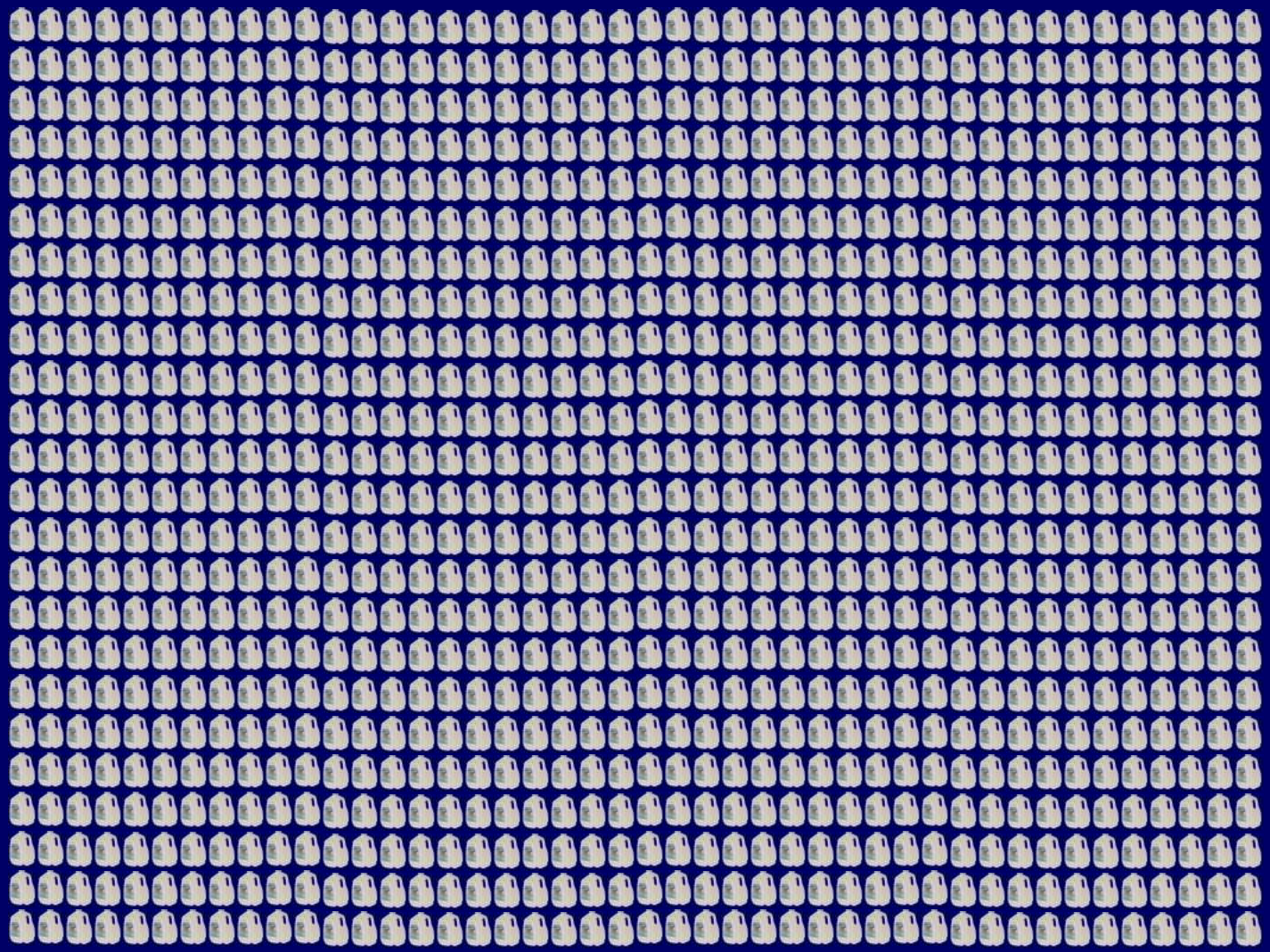
Irrigation: 1000 - 1200 Gallons of Water

Processing:

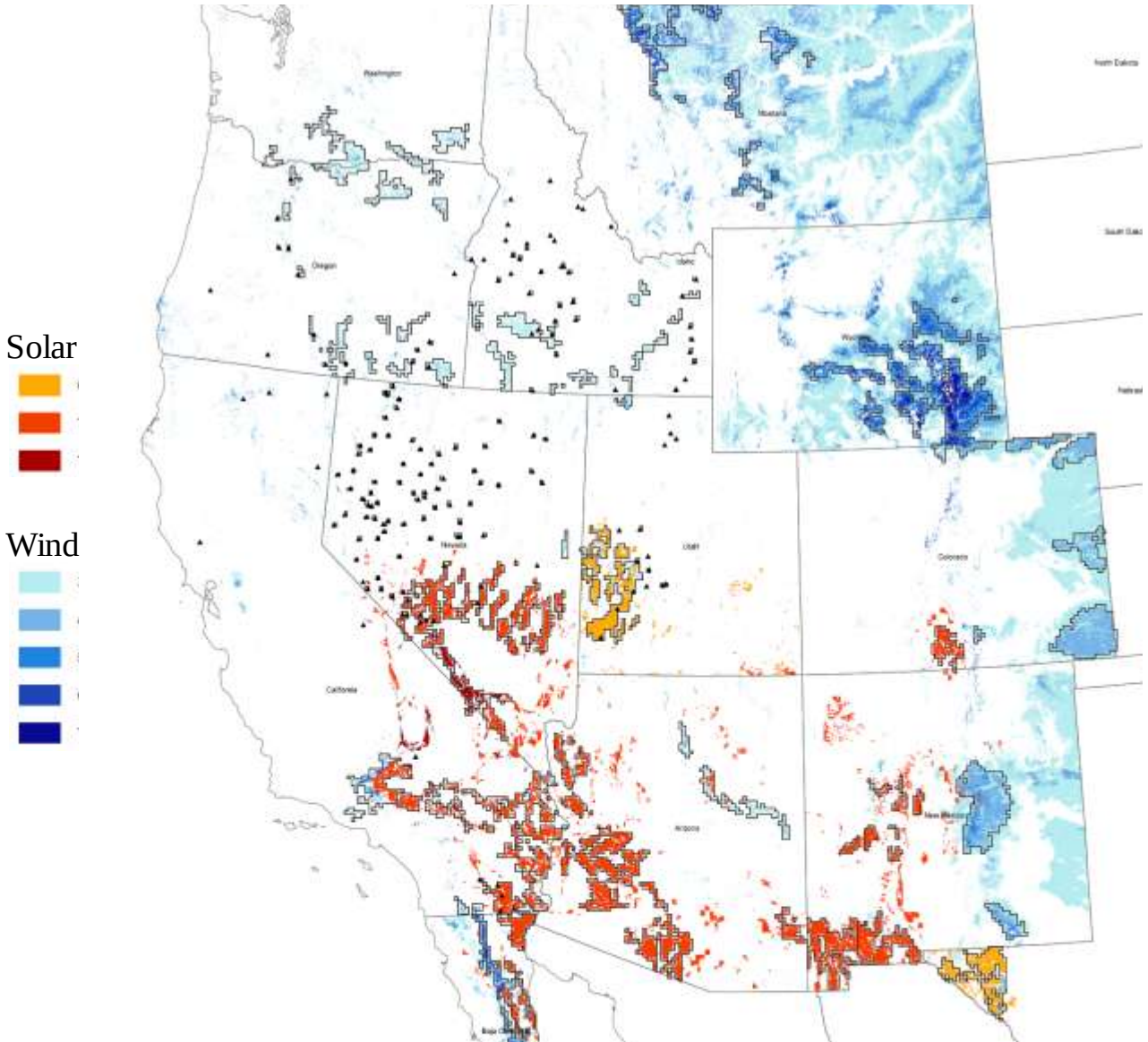
4.2 Gallons of Water

1 Gallon of Ethanol





New Demands – Renewables?

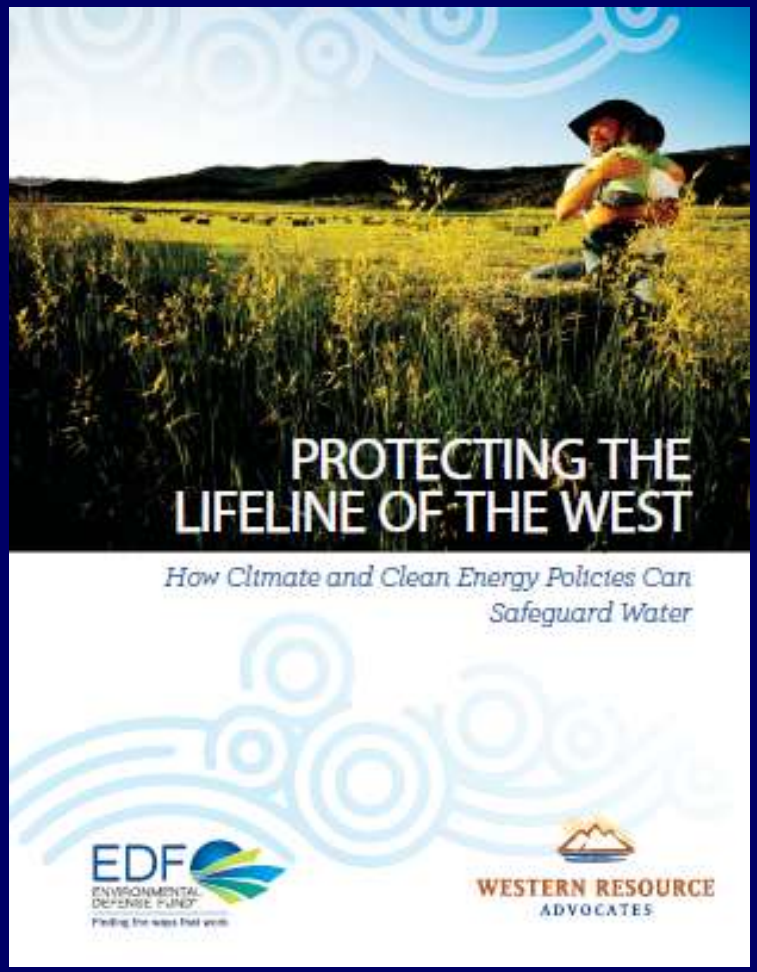


New Water Supplies?

- HB 1365 – Clean Air, Clean Jobs Act
  - Retire/repower/retrofit ~900 MW of coal plants on the Front Range (incl. Cherokee, Valmont, Arapahoe)
  - Cherokee (Denver) – consumes ~7,000 AF/yr
  - Valmont (Boulder) – consumes ~2,000 AF/yr
- What is the water value of Xcel's plan?
  - Water rights: $86 million
  - Timing: 2015 – 2022
- Are there other opportunities for energy decisions to benefit water?

Key Recommendations

- ✓ Conservation & efficiency
- ✓ Recycled water
- ✓ Renewable energy
- ✓ Decentralized solutions
- ✓ Flexible leasing arrangements
- ✓ New partners



"The greatest issue facing future generations is the combined effect of ever increasing human numbers and the emergence of a dramatically altered climate. Only by pursuing water efficient renewable energy supplies immediately, beginning the long journey to a more water and energy efficient culture, and managing our water resources adaptively, do our children even have a chance of meeting the challenges that surely will confront them."

- Patricia Mulroy, General Manager, SNWA

http://www.westernresourceadvocates.org/water/lifeline.php

Stacy Tellinghuisen
Energy/Water Analyst

stacy@westernresources.org

www.westernresourceadvocates.org

WESTERN RESOURCE
ADVOCATES