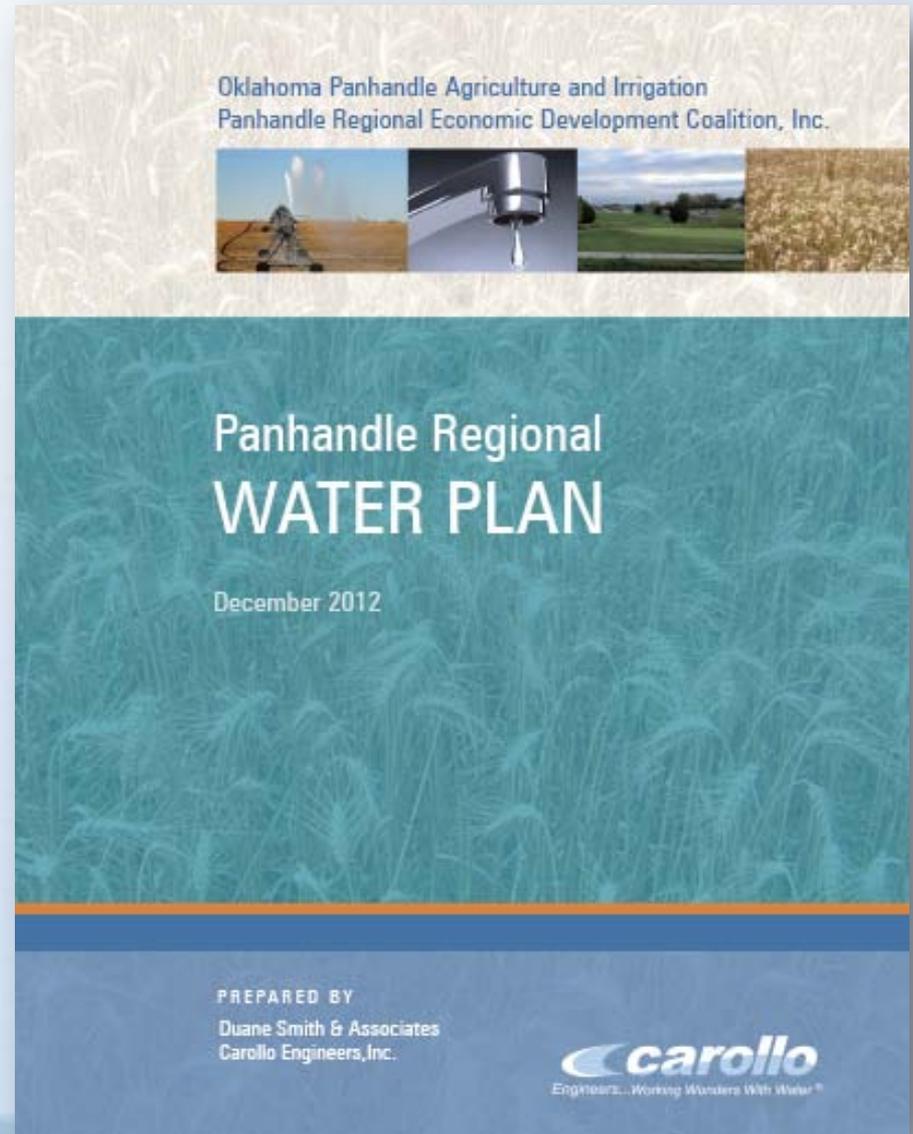


PANHANDLE REGIONAL WATER PLAN

Water Efficiency

Water for 2060 Briefing
February 18, 2014

John Rehring
Carollo Engineers

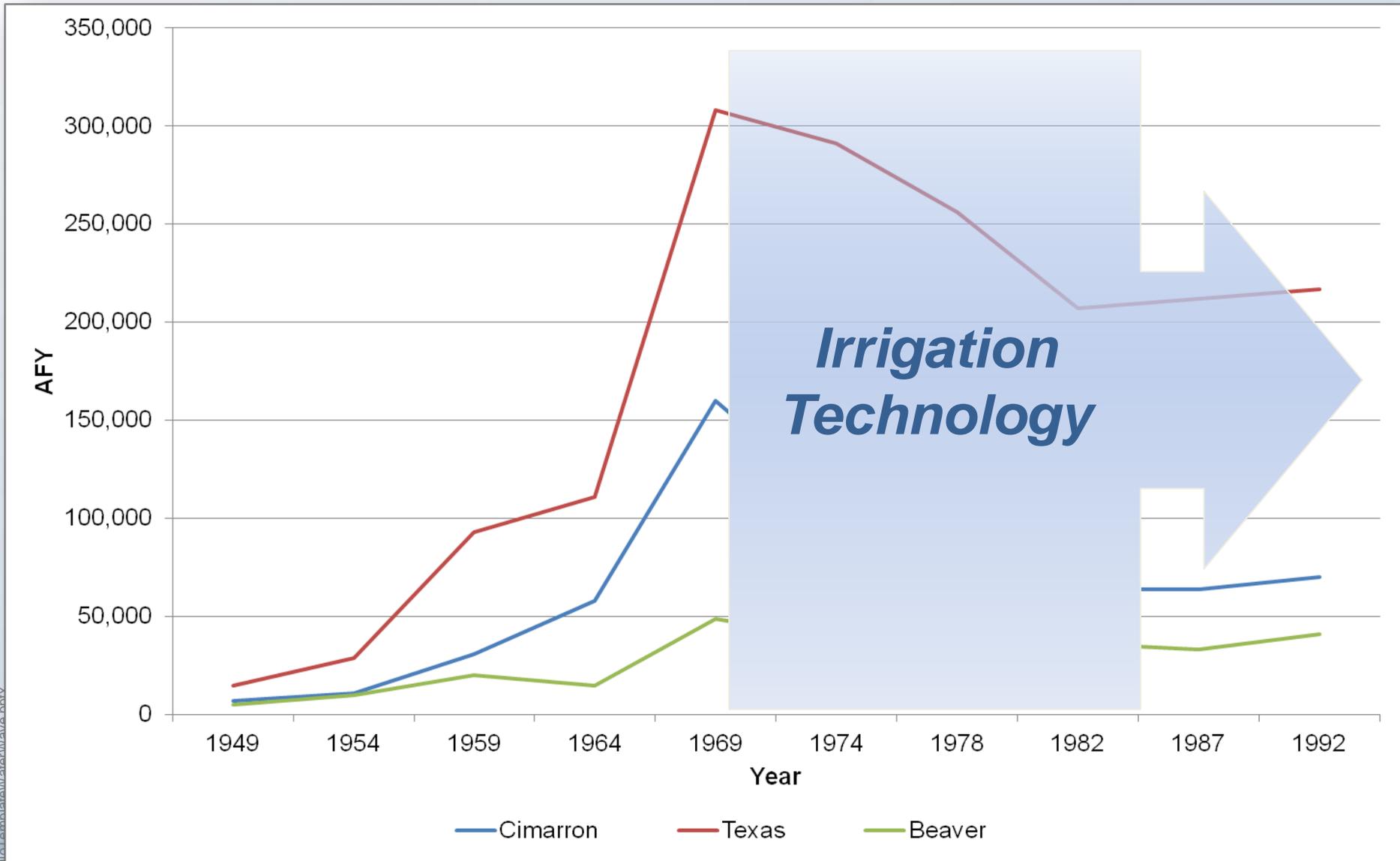


Panhandle Regional Water Plan

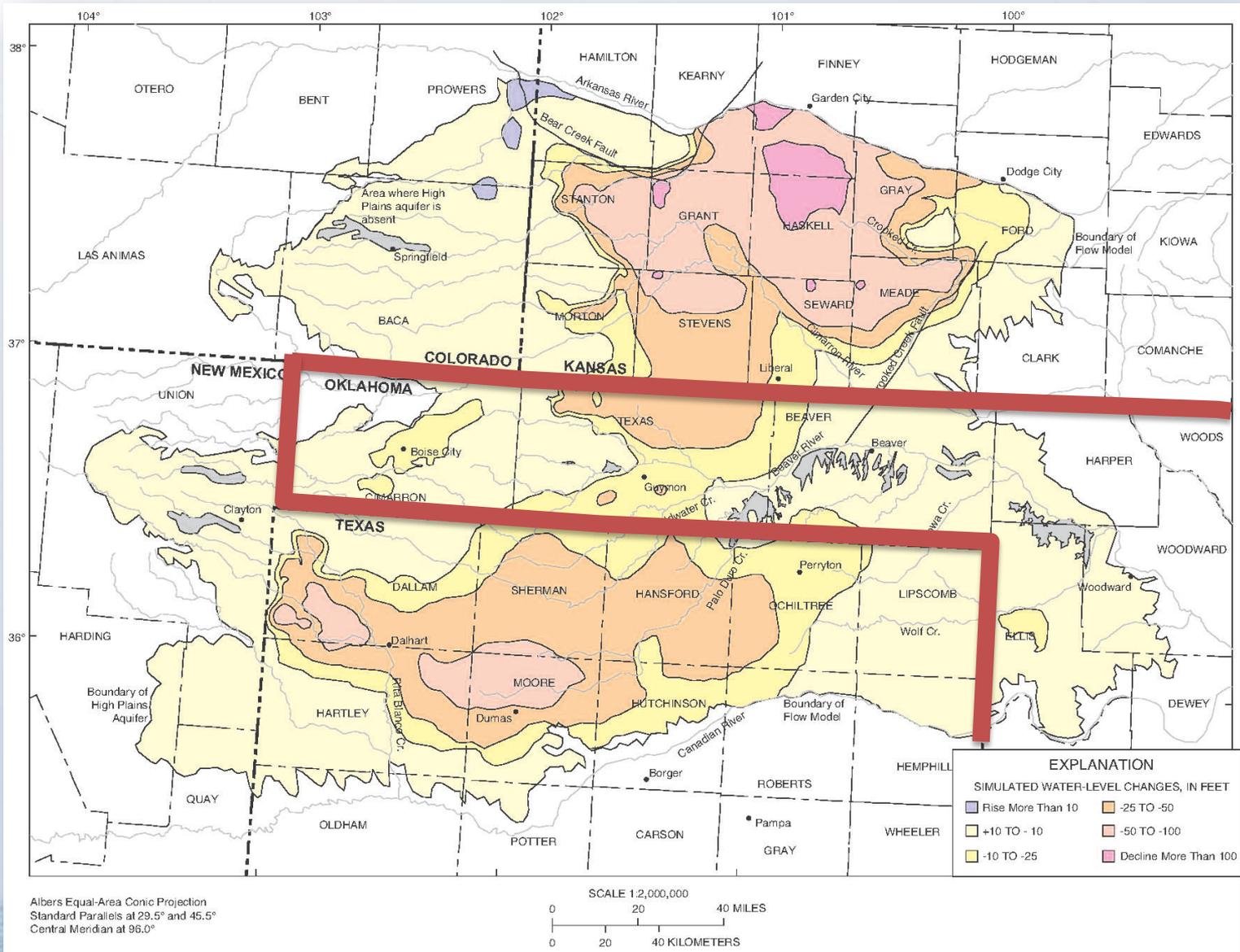
Mission and Vision

The Oklahoma Panhandle Water Planning Group will strive to **develop strategies for the efficient utilization of water resources** including water conservation, water re-use, augmentation, and other water management strategies to promote economic development and benefit the citizens and environment of the Panhandle of Oklahoma.

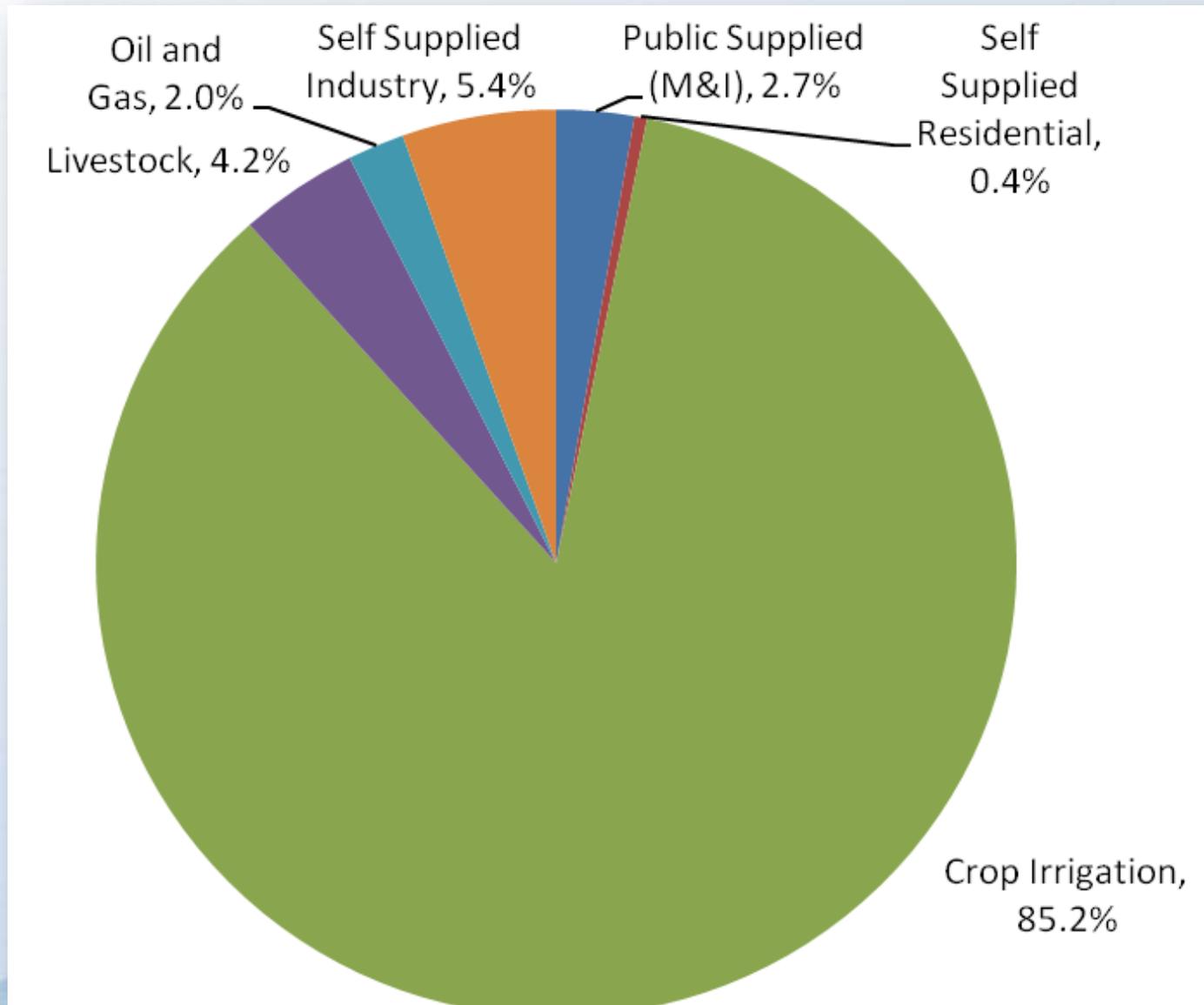
Historic Ogallala Aquifer Water Use



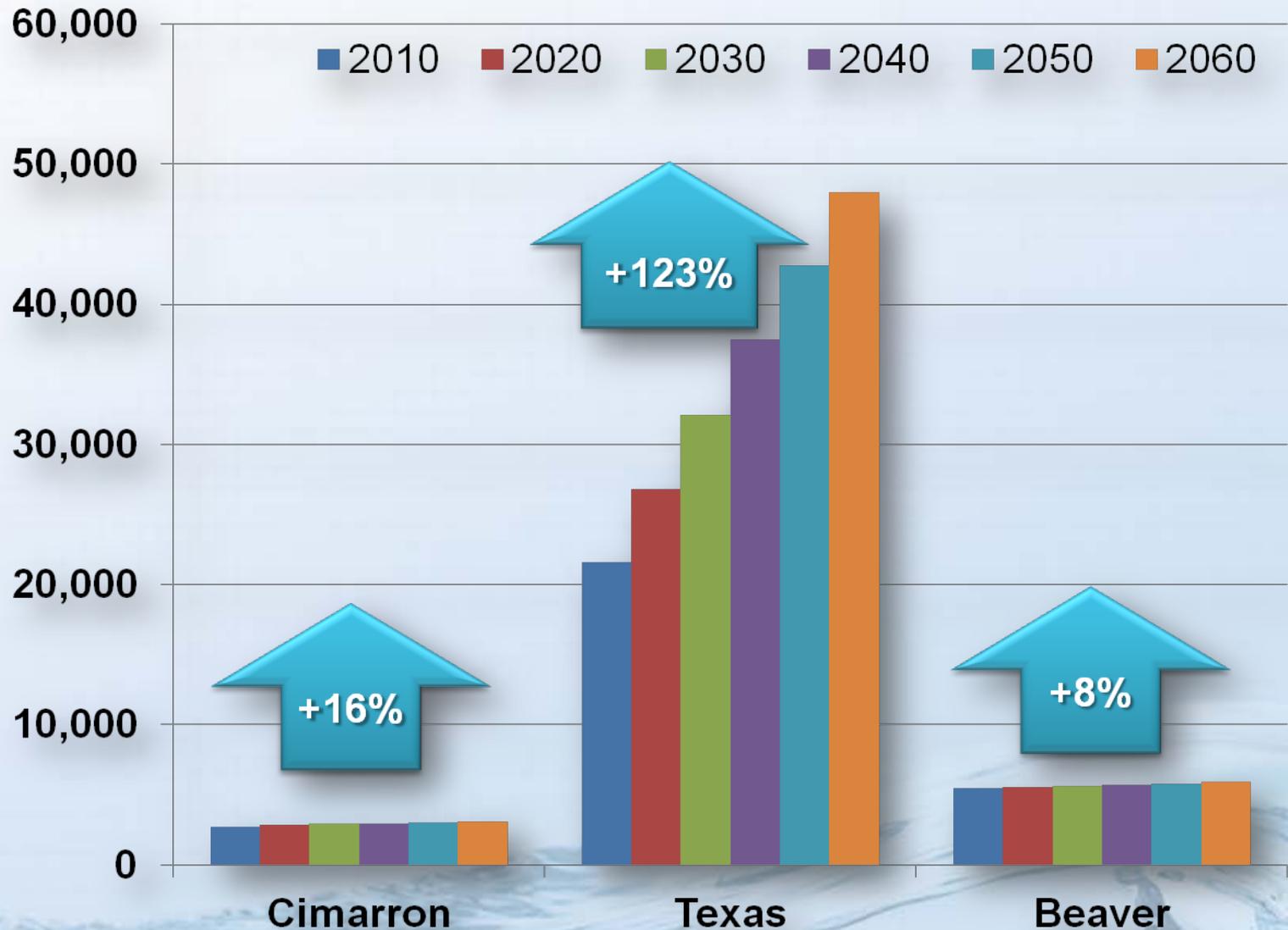
Water Level Changes 1998-2020



Demands by Water Use Sector



Projected Population Growth by County



USGS and USDA Panhandle Data

Cimarron, Texas, and Beaver Counties

	1995	2000	2005	2010
Crop Irrigation Water Use (USGS water use reports, mgd)	603	369 ↓	218 ↓	
Irrigated Acres (USDA Ag Census)	230,918 1997		232,058 2007	→
Market Value of Agricultural Products Sold (USDA Ag Census)	\$2.93B 1997		\$3.24B 2007	↑

What do these data tell us?

- ✓ Efficient water management strategies can and do support a vibrant Panhandle economy.
- ✓ Investments made in irrigation and crop technologies and efficiencies have made a difference.
- ✓ Farmers have already taken major steps to preserve and extend the life of the aquifer, investing in conservation, and these programs must continue.

Increasing Efficiency Increases Economic Potential



Today's
efficiencies

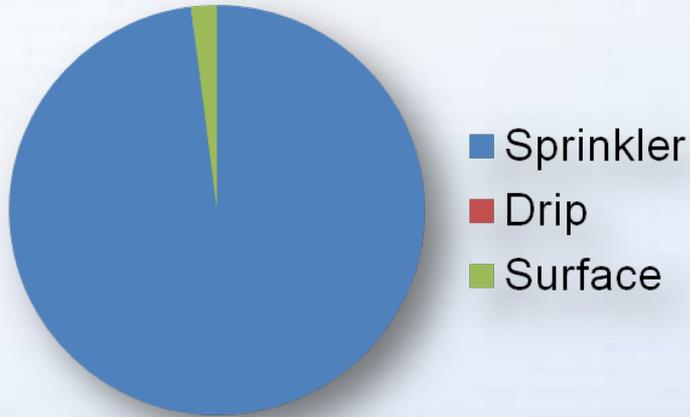


Increased
efficiencies

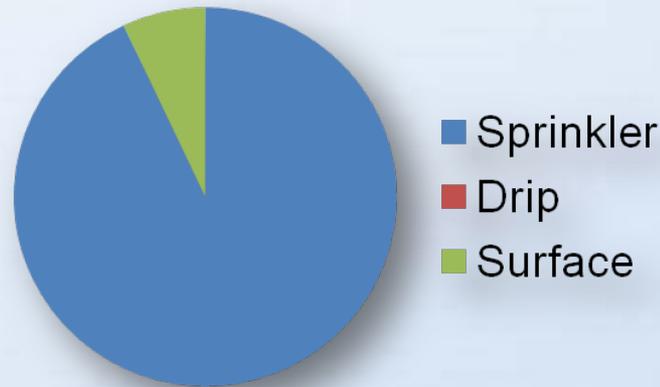


Are We Irrigating Our Crops Efficiently?

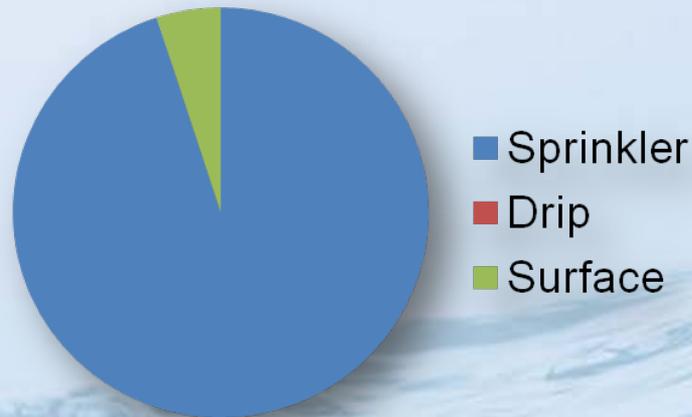
Cimarron



Beaver



Texas



Method	Field Application Efficiency
Surface	64%
Sprinkler	85%
Drip	89%

What if We Converted All Crop Irrigation to Drip Irrigation (Micro-irrigation)?

COST

- Capital cost for a one-time retrofit ~\$345 million

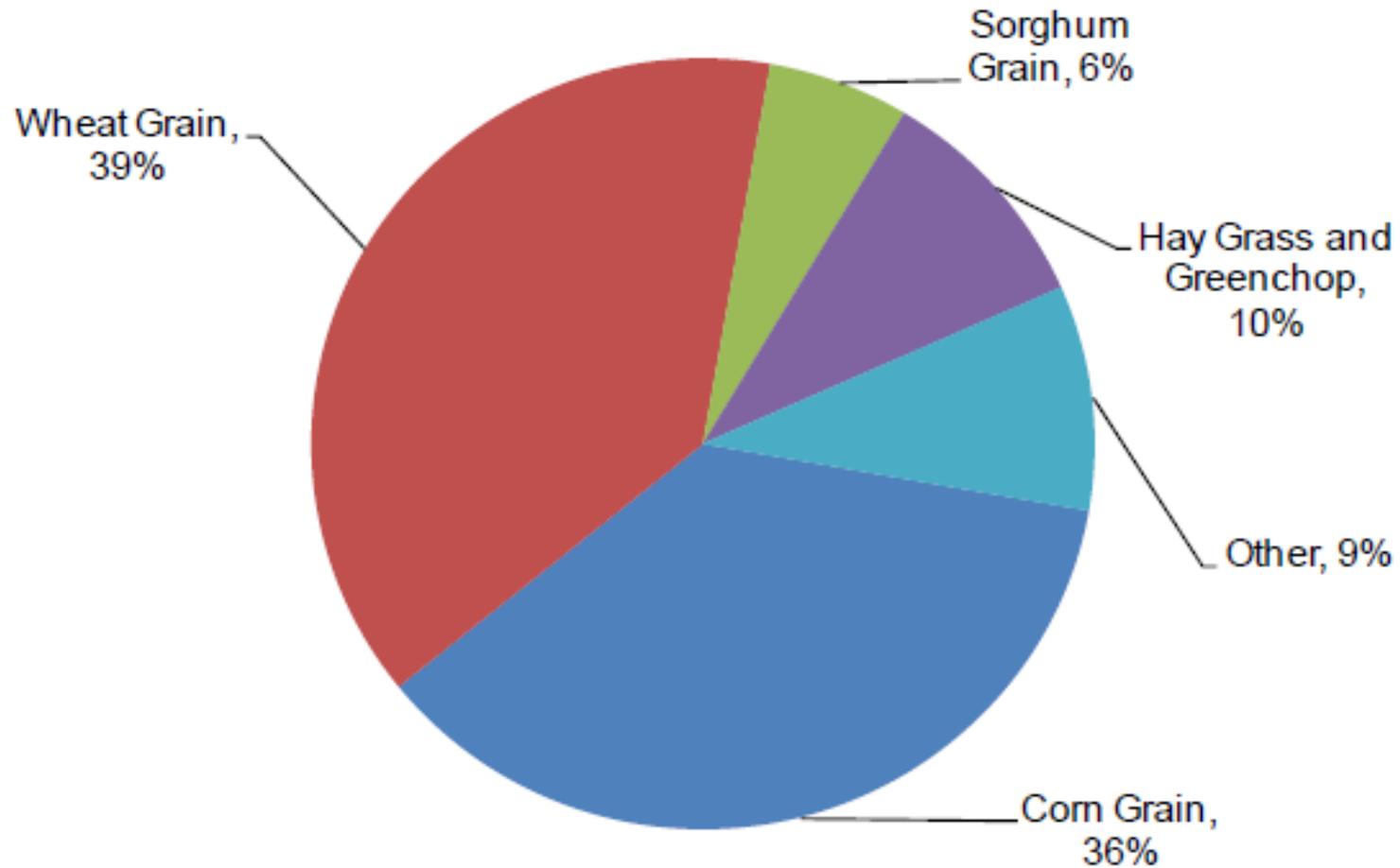
BENEFIT

- If operated for a period of 10 crop harvests, would reduce demand by a cumulative total of about 175,000 AF of water

ASSESSMENT

- Results in a per-AF capital cost of more than \$1,500 per AF of water conserved (\$4.60 per 1,000 gallons)

What Are the Primary Crops?



**IRRIGATED ACREAGE OF PANHANDLE COUNTIES
CROP HARVEST IN 2007**

Could We Plant Other Crops?

- Crop selection is a function of market drivers
- But consider a hypothetical situation:
 - Change all 84,000 acres of irrigated corn to wheat and sorghum
 - Reduction in Crop Irrigation water use would be about 24% (70,000 AFY)
 - Economic impact would be ~\$60 million/year loss (43% reduction)
 - Irrigating additional cropland with the saved water (e.g., 125,000 new acres of wheat) would require \$187 million in new irrigation equipment
 - Revenues from this newly irrigated cropland would not offset the economic impacts

PRWP Conclusions: Water Efficiency

- Surface water is extremely limited and unreliable
- Groundwater recharge is very slow, but there is significant water in storage in the Ogallala aquifer
- The rate of water level declines slows down with reduced water use
- Irrigation efficiencies and technologies have already resulted in significant reductions in water use
- Increased efficiencies support increased economic benefits from our limited water supplies
- Continued efforts to enhance water use efficiency are critical to ongoing economic vitality in the Panhandle



Water Conservation, Efficiency, Recycling & Reuse

• **Panhandle Action Plan:**

- Actively identify incentive programs that would be beneficial to water users in the Panhandle region.
- Promote a culture of water efficiency by reducing unit water demands, while allowing for the economic vitality and growth that is dependent on adequate water supplies without capping overall water use.
- Support the research, development, application, and implementation of water-efficient technologies and practices for all water use sectors in the Panhandle
- Support initiatives and seek funding to support eradication of salt cedar and other invasive species that reduce our available water supplies.

Panhandle Water Management Strategies

- Research and development (drought-tolerant crops, alternative crops, efficient irrigation technologies)
- Invasive species eradication
- OPSU & OSU research priorities
- Streamlined permitting
- Additional groundwater data collection
- Regulatory relief
- Water reuse programs and incentives
- Cost share opportunities
- Low interest loans for water and wastewater
- Information sharing and education for irrigators
- Information sharing and education for municipal water users

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