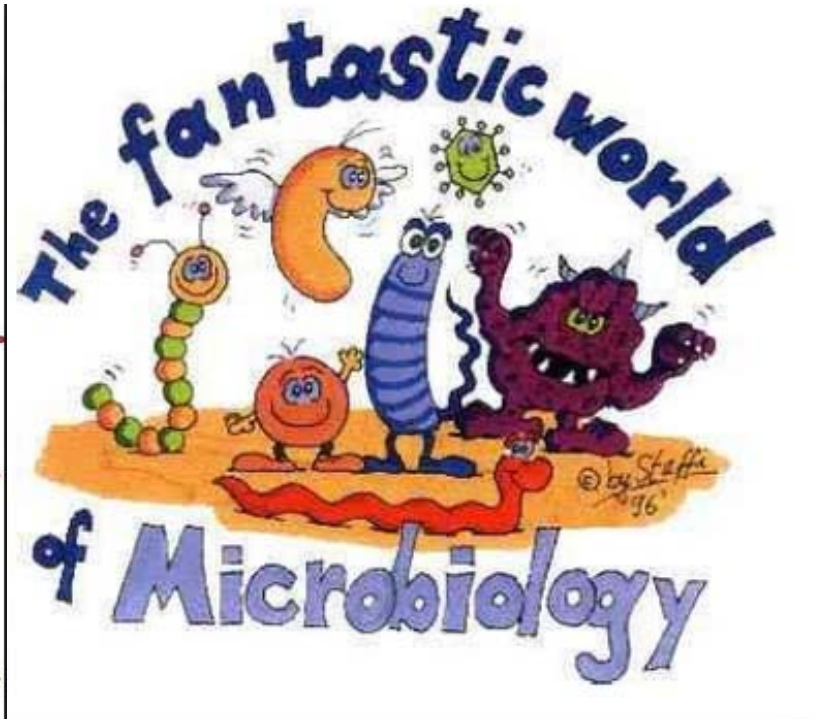
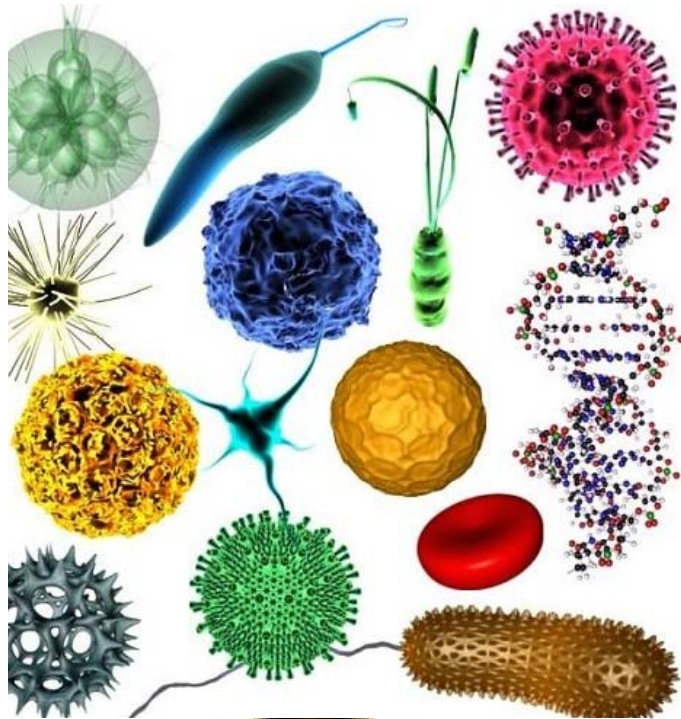


**A Conservationist's View of
Water In Kansas
Dyck Arboretum – Hesston, KS
March 7, 2015
Joyce Wolf,
Audubon of Kansas**

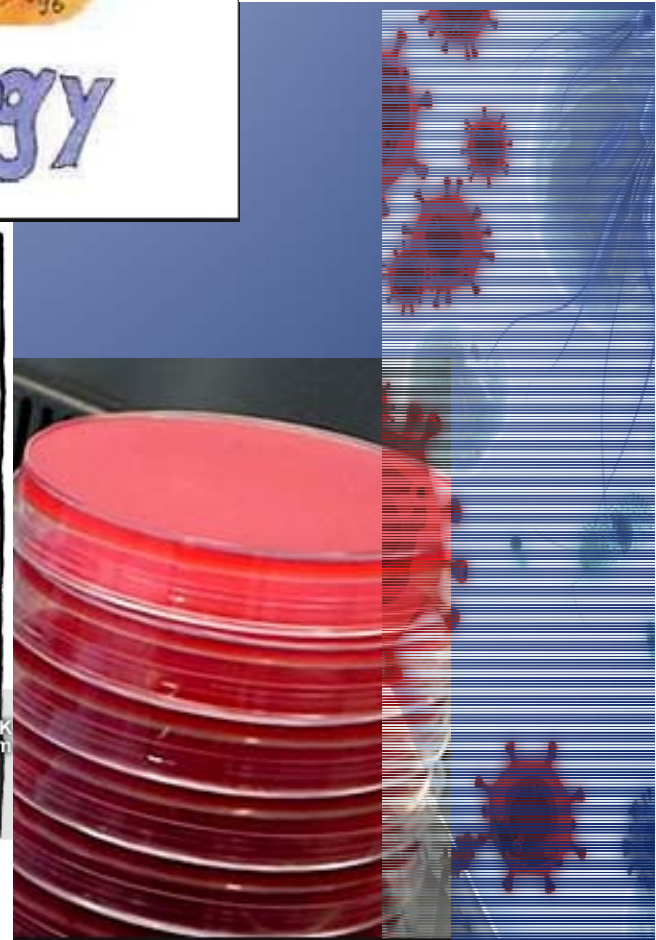




"Why yes I am a microbiologist, how did you guess?"



"Excuse me, sir, but would you mind getting the door for us?"

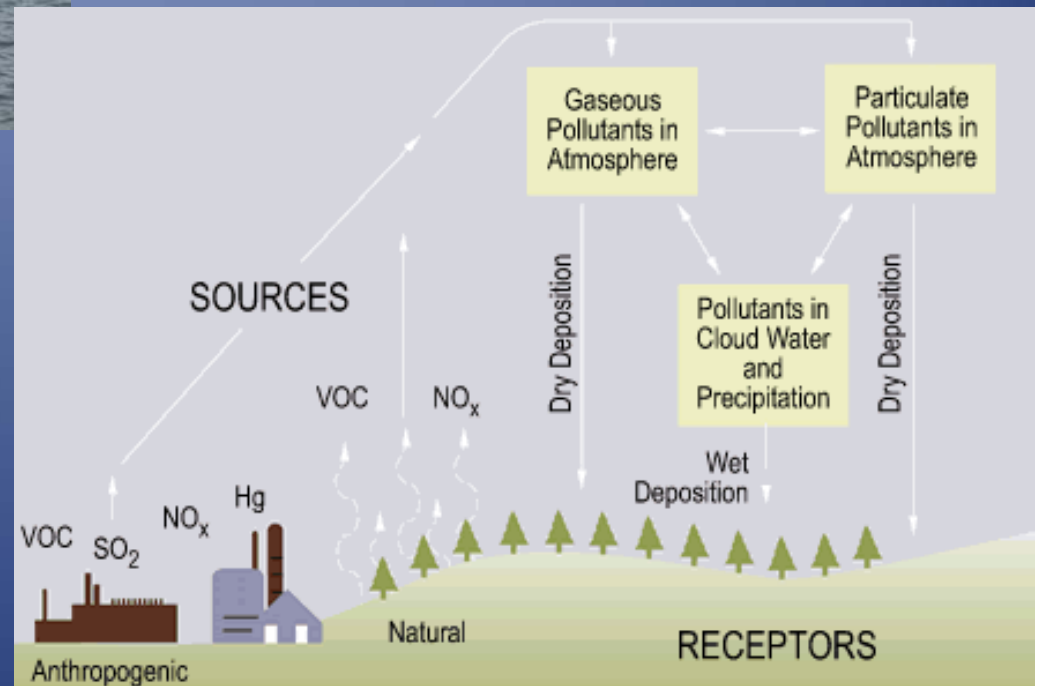


Minnesota Valley National Wildlife Refuge





1985 attended the National Audubon Society's BOOT CAMP ON CLEAN AIR ISSUES



The 1990 Clean Air Act amendments recognized the harmful effects of SO₂ and NO_x emissions on human and environmental health.



Cheyenne Bottoms is the largest interior wetlands in the U.S. and provides critical habitat for diverse species including Whooping Cranes and Least Terns. It has tremendous tourism potential.



Birding Benefits to Local Economies

- **Birding in the United States: A Demographic and Economic Analysis**
- *Addendum to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*

2006 Birding in the United States: A Demographic and Economic Analysis by the USFWS

Birders	47,693,000
Total Expenditures	\$35,727,724,000
Total Output	\$82,176,751,000
Jobs	671,000
Employment Income	\$27,695,934,000
State Tax Revenues	\$6,157,252,000
Federal Tax Revenues	\$4,375,932,000

Total Birding Industry Output

- The previous table depicts the economic effect of US bird watching expenditures in 2006. The trip and equipment expenditures of \$36 billion in 2006 generated \$82 billion in total industry output across the United States.



Wings 'N' Wetlands Festival Returns to Great Bend, KS in 2015

A Few Migratory Birds of Cheyenne Bottoms



“Saving Cheyenne Bottoms”

- Multi-group Task Force was formed to demonstrate support for increased funding for improved water-management capabilities
- Environmental, Conservation and Businesses were part of the Task Force
- Science-based data was employed to show the feasibility of the proposals
- Key legislators were approached and brought onboard to support the efforts

A FEW KANSAS WATER-LAW TERMS:

“First in Time is First in Right”

“Senior, Junior and Vested Water Rights”

“Point of Diversion”

“Use it or Lose It”

“Groundwater Management Districts”

“Water Assurance District”

“Acre Feet”

“Minimum Desirable Stream Flows”

“Local Enhanced Management Area”

“Multi-year Flex Accounts”

Sometimes a little humor
goes a long way
to help make a positive impact!



***“IS YOUR LEGISLATOR
A SITTING DUCK?”***

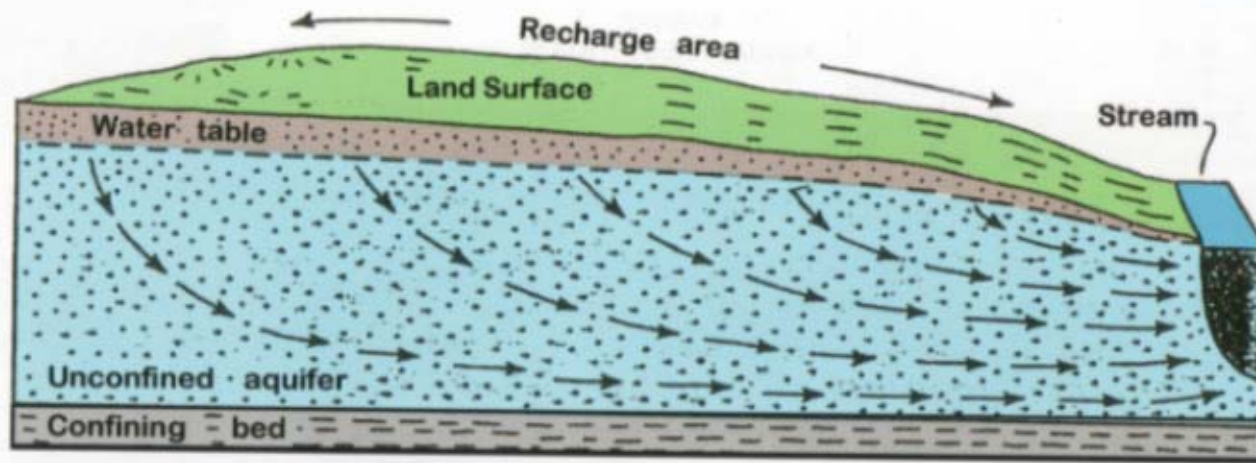
*Sponsor a cushion, so while
the legislators’ “bottoms”
are resting comfortably,
the representatives may be
encouraged to think
favorably about saving our
“Bottoms!”*

Appropriation Doctrine

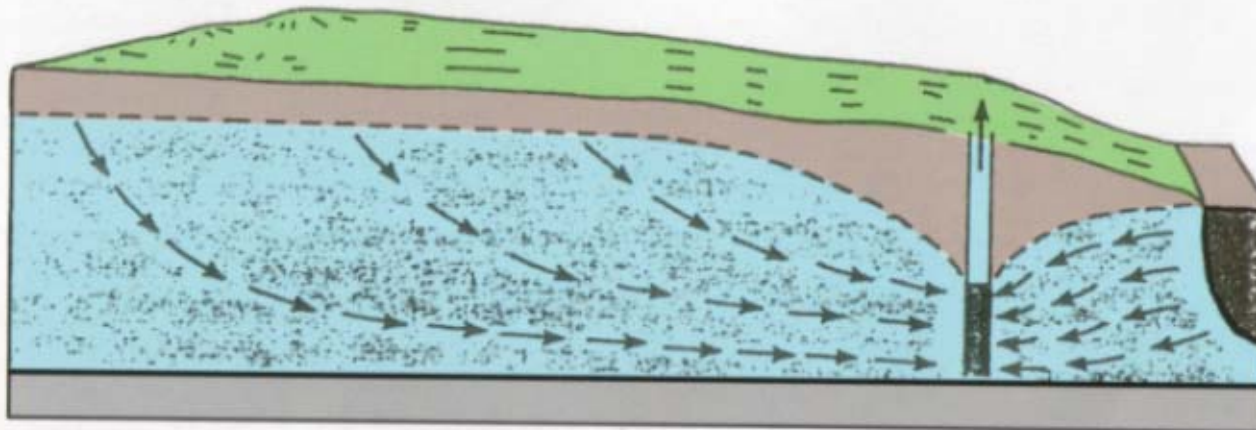
- K.S.A. 82a-701 through K.S.A. 82a-737
- K.S.A. 82a-702 “Dedication of use of water. All water within the state of Kansas is hereby dedicated to the use of the people of the state, subject to the control and regulation of the state in the manner herein prescribed.”
- Appropriation Doctrine means. “First in Time is First in Right”.
- This principle is applied regardless of the type of use. K.S.A. 82a-707 provides; “....the date of priority of an appropriation right, and not the purpose of use, determines the right to divert and use water at any time when the supply is not sufficient to satisfy all water rights that attach to it.”



**Excessive water
withdrawals for irrigation
can reverse the normal flow
of groundwater towards
streams and eventually
dewater the stream.**



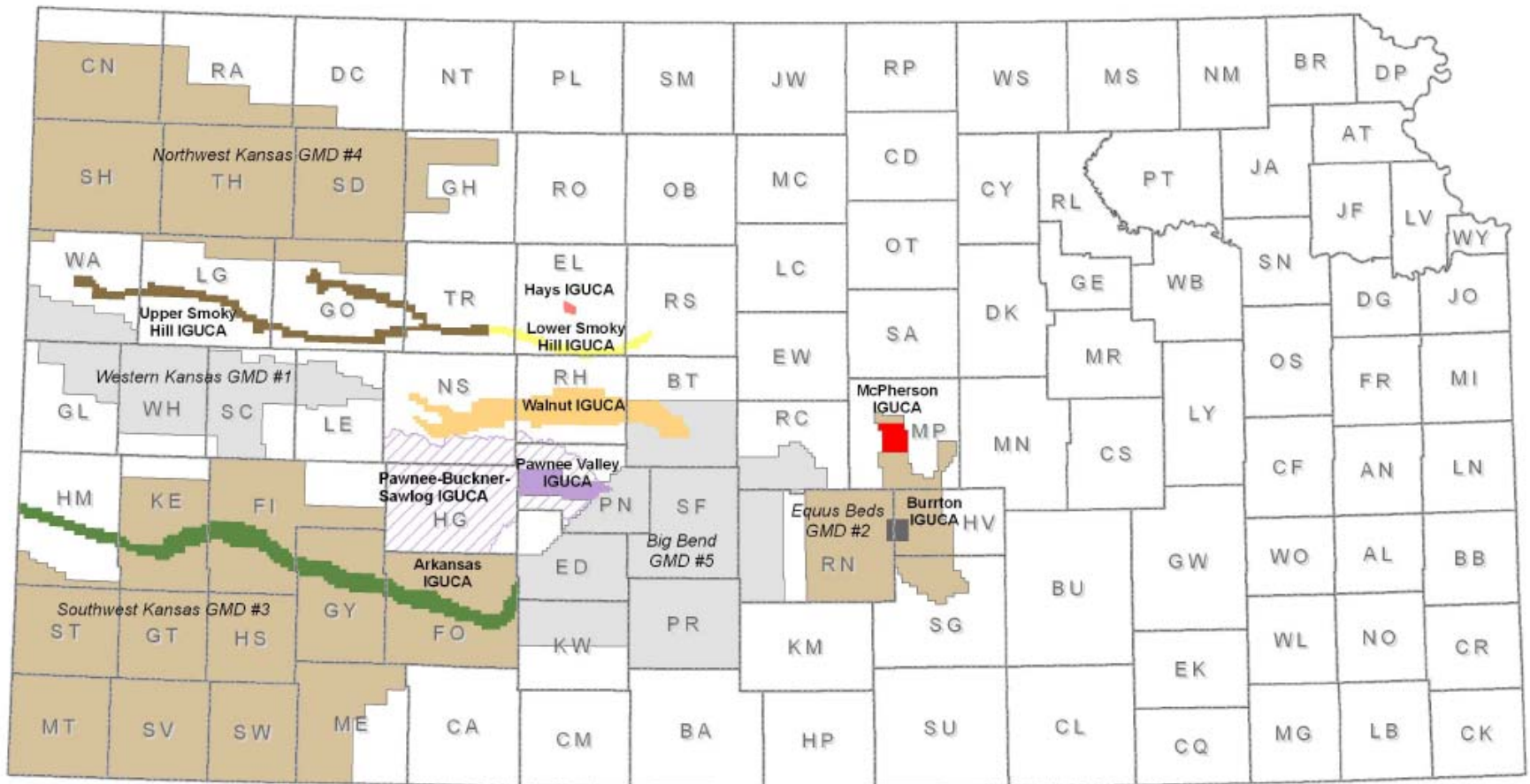
Cross section shows land-surface recharge area (green) where precipitation percolates by gravity to the water table (dashed line), then moves through the aquifer (light blue) and discharges to the stream or river.



Similar cross section showing how excessive groundwater withdrawals will lead to streams and rivers being dewatered as the water table falls below the base of the stream.

(Illustrations modified from USGS Open File Report 90-183, published in 1990)

Intensive Groundwater Use Control Areas in Kansas



Kansas Department of Agriculture
 Administrative Services, GIS
 January 11, 2010



Legend

- | | | | | |
|----------------|------------------------|---------------------|------------------------|-----------------------------|
| Arkansas IGUCA | Hays IGUCA | McPherson IGUCA | Upper Smoky Hill IGUCA | Pawnee-Buckner-Sawlog IGUCA |
| Burrton IGUCA | Lower Smoky Hill IGUCA | Pawnee Valley IGUCA | Walnut IGUCA | |



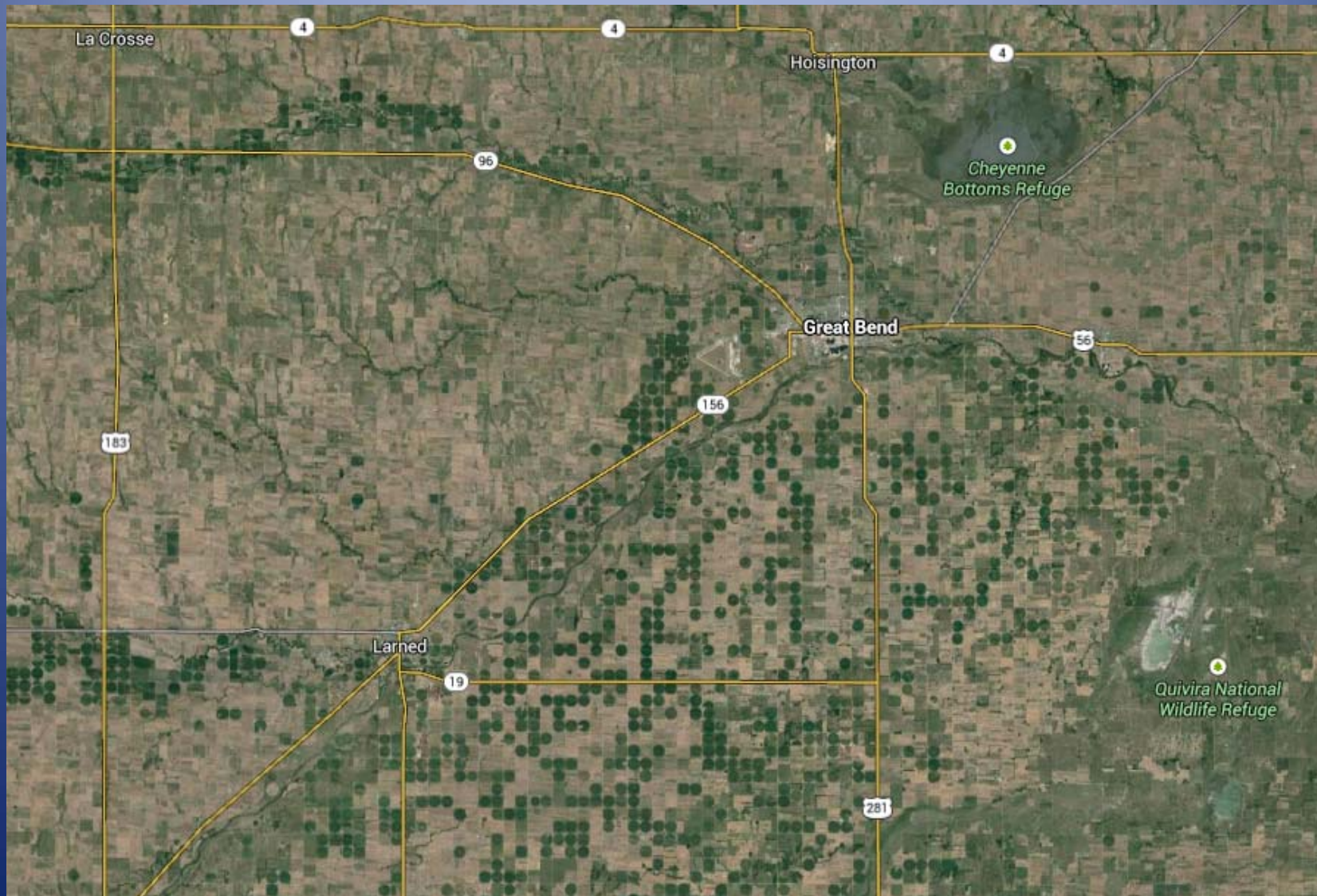
Wet Walnut Creek Point of Diversion for Cheyenne Bottoms – Fall 2013



Control Structures Allow Improved Water Management Capabilities



Irrigation in the Arkansas River Valley



Arkansas River – fall 2013

Near Point of Diversion for the Bottoms

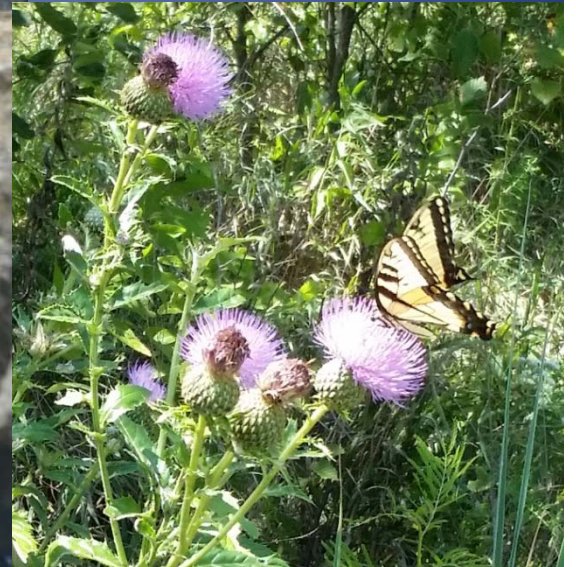


The Kansas Water Plan recognizes that recreational opportunities “improve the quality of life for the citizens of Kansas and contribute to the state’s economy.”

Reservoir	Visitors	Visitor Hours	Visitor Expenditures (millions of dollars)
John Redmond	127,486	1,193,936	1.1
Kanopolis	250,535	1,777,746	2.6
Milford	746,666	7,024,587	7.6
Toronto	141,109	3,036,266	1.9
Clinton	2,008,108	10,659,086	19.3
Elk City	120,493	1,482,006	1.1
Tuttle	454,966	1,781,549	3.7

Table 5. Summary of the economic benefits of selected federal reservoirs on surrounding communities. Source: K-State Agricultural Economics Program

All Living Things Need Water



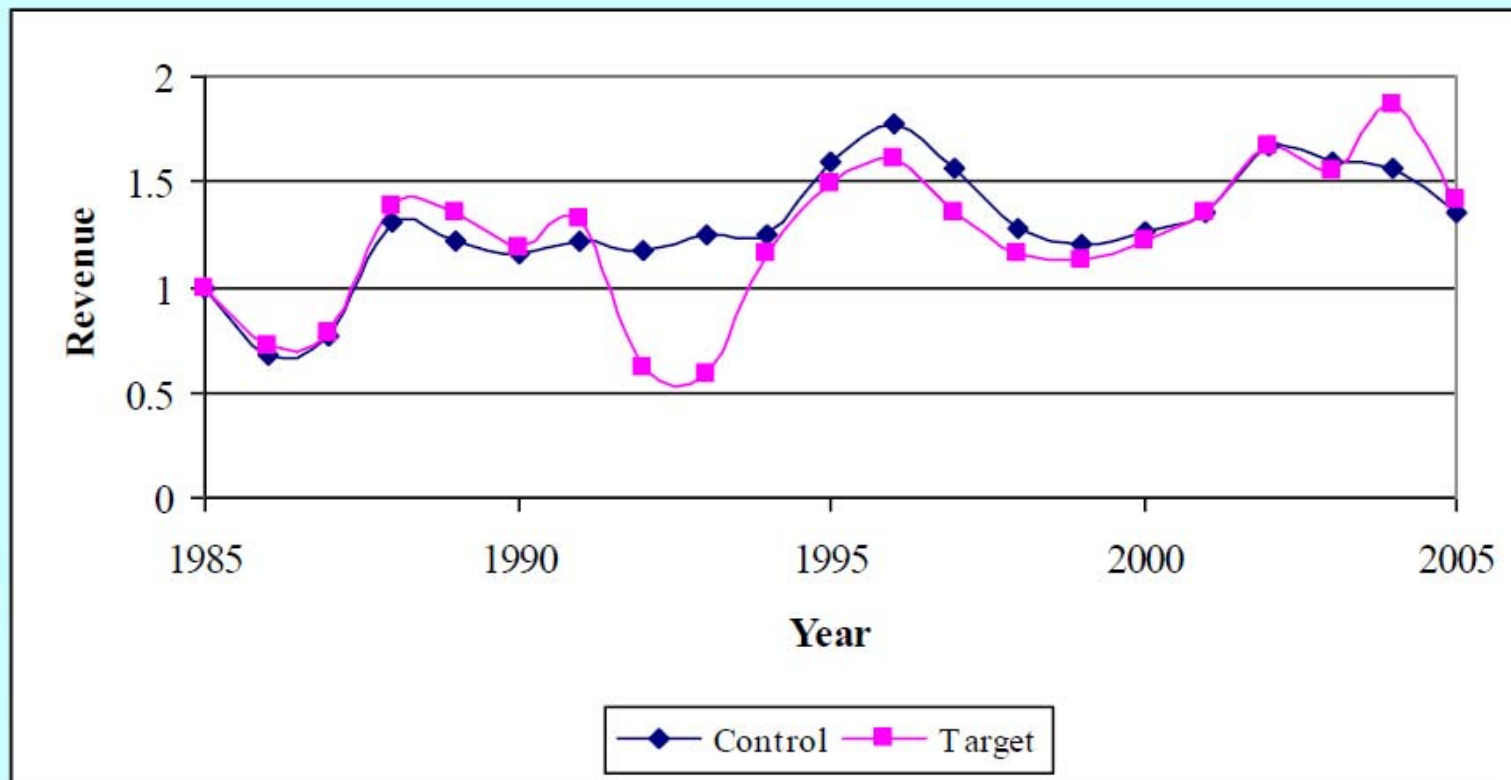
KSU 2013 Study of the Ogallala Aquifer Options:

Conclusions From Studies

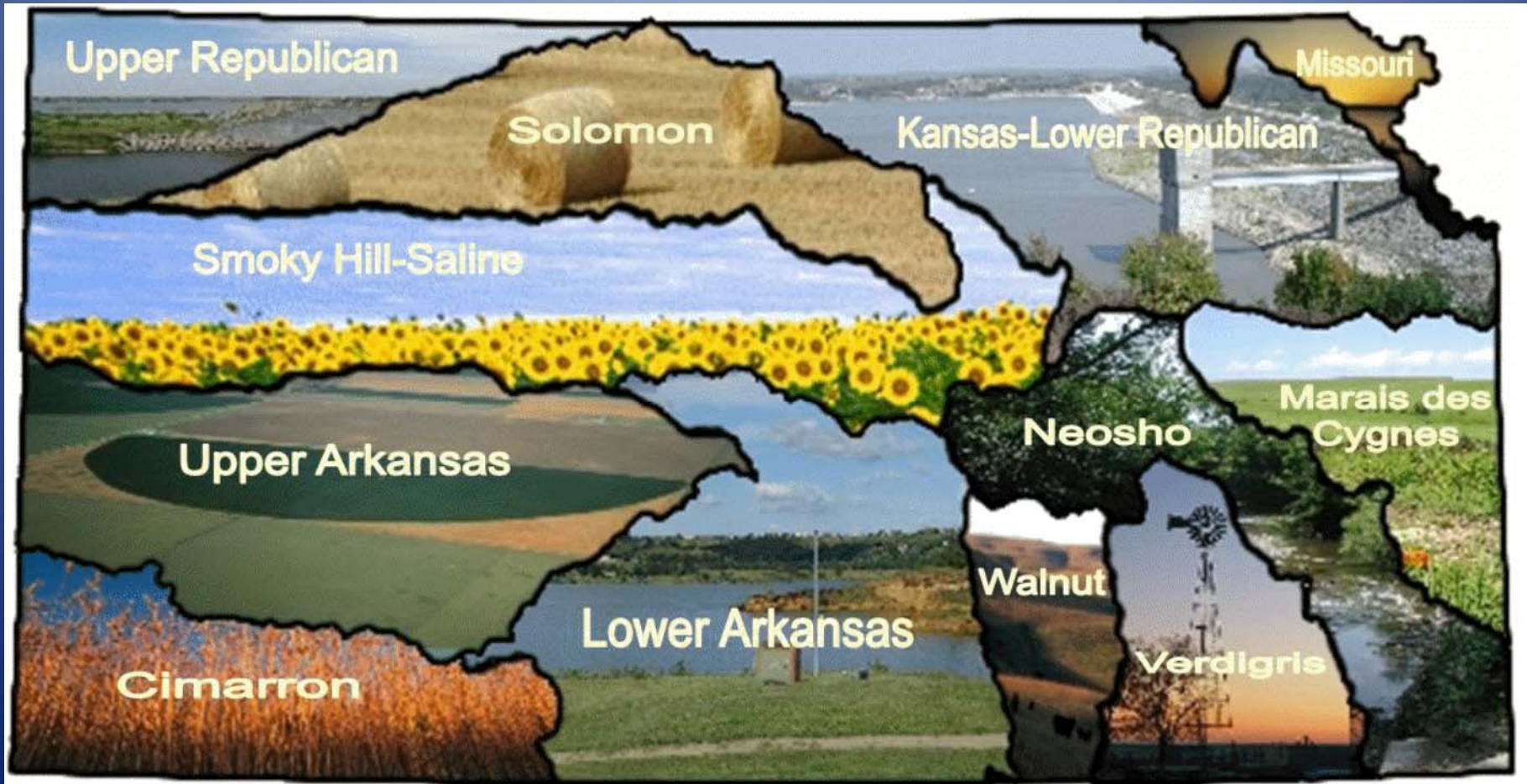
- Some form of long term water use restriction is necessary in order to achieve any meaningful water savings.
- Adoption of improved biotechnology or more efficient irrigation systems **without restrictions on water use will not save water.**
- However using these strategies **with a water use restriction policy** can help negate the negative impacts to producer income and the regional economy.
- Water use reductions are preferable to acreage reductions.
- Flexibility in implementing water use reductions may reduce the economic impacts **(Give producers greater ability to adjust.)**

What will be the Impact on Regional Economies? The Wet Walnut IGUCA

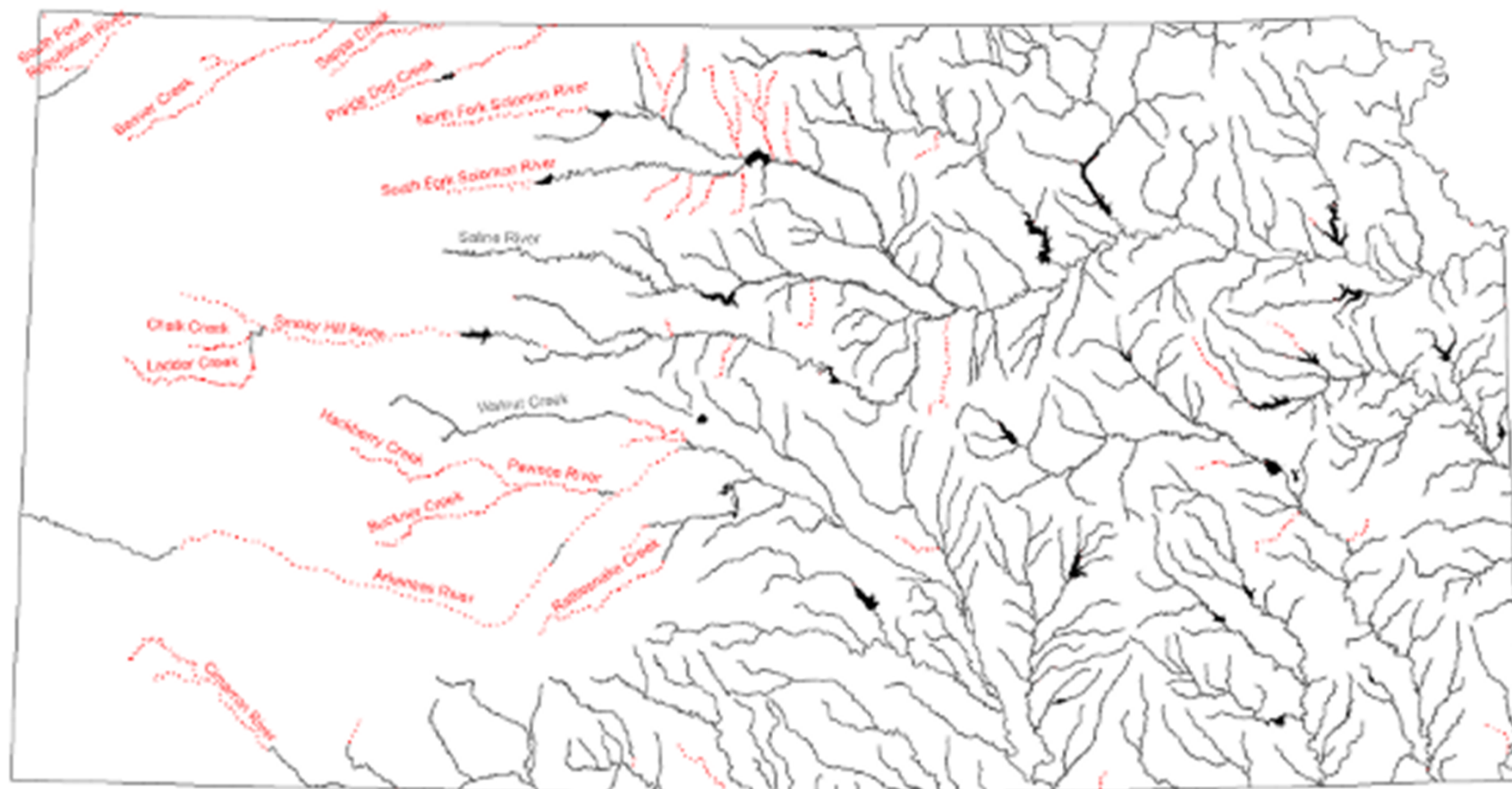
Figure 5. Time Series Comparison of the Indexed Values of Irrigated Crop Revenue



Watershed Basins for Water Planning in Kansas



Major Perennial Streams 1961 and 2009



Kansas Department of Agriculture
Administrative Services, GIS
March 12, 2010

Legend

- - - - - Streams regarded as perennial in 1961 but as nonperennial in 2009
- Streams regarded as perennial in both 1961 and 2009



Stream Data provided by the Kansas Department of Health and Environment.
1961 coverage (USGS: special surveys)
2009 coverage (KDMR: long-term observations)

Perennial: containing water throughout the year except for infrequent periods of severe drought (USGS, 1996).

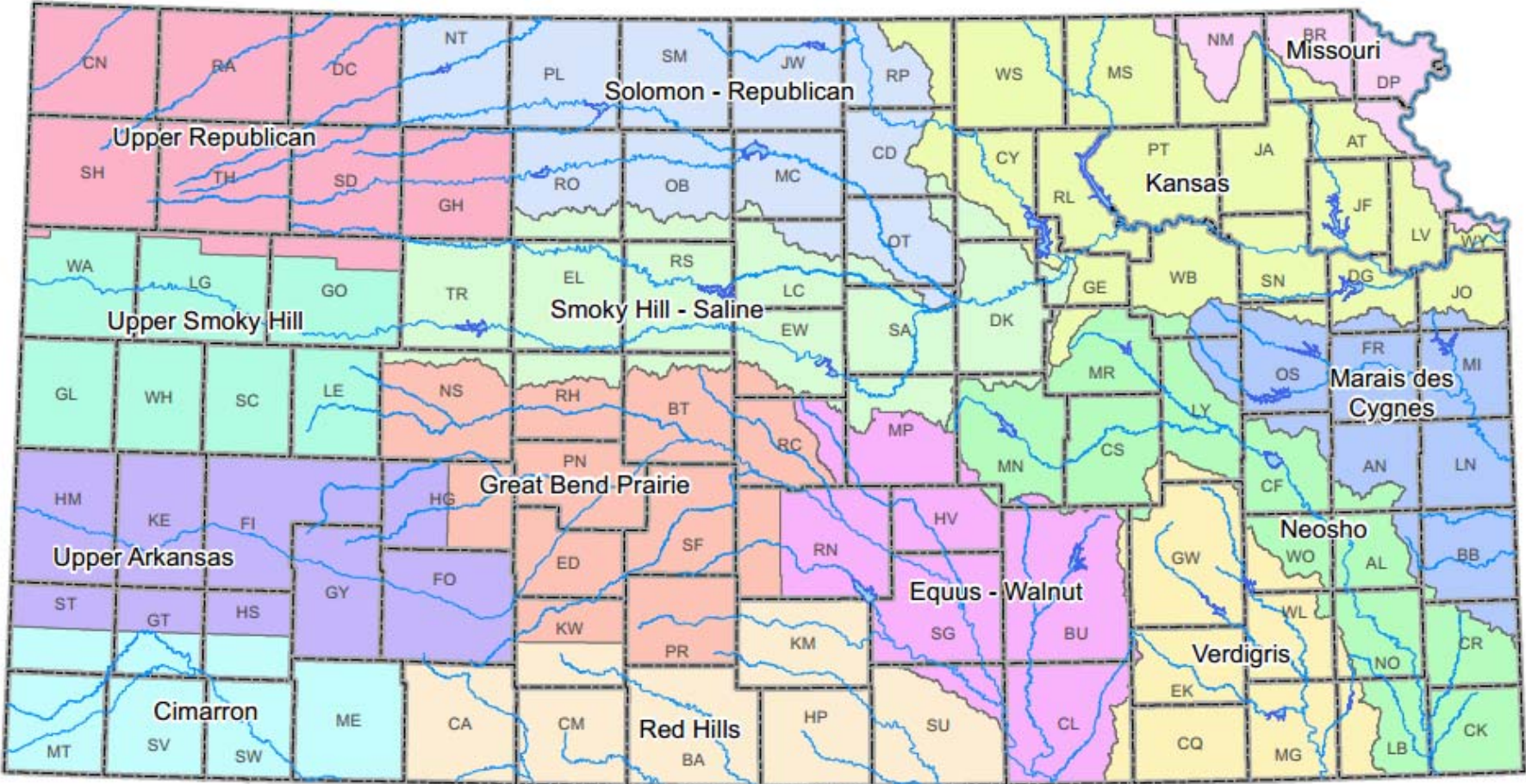


Note: Some of the smaller streams shown on this map lacked recent observational data but were carried over as perennial systems pending further study. The standing body of water located near the center of the map and just north of the Arkansas River is Clayco Bottoms, which is normally a terminal lake.

DWR and MDS

- “Minimum desirable streamflow (MDS) requirements were made part of the Kansas Water Appropriation Act by the Kansas Legislature to ensure base flows in certain streams to protect existing water rights and to meet in-stream water uses related to water quality, fish and wildlife and recreation.”

New Water-Planning Boundaries



How is the State Water Plan Funded?

- **The State Water Plan Fund was created by the 1989 legislature to provide a permanent, dedicated and stable source of funding for water related programs and projects:**
- Fee Funds from: municipal, industrial and stock-water use
- Registration of pesticides and sale of fertilizers
- A demand transfer of \$6 million from the state general fund
- \$2 million from the EDIF (lottery) were also set.
- Over the last 5 fiscal years, the transfer has only been made once, in FY 2011 in the amount of \$1.3 million.

(KWO staff report generated in 2014 for KS Water Authority)

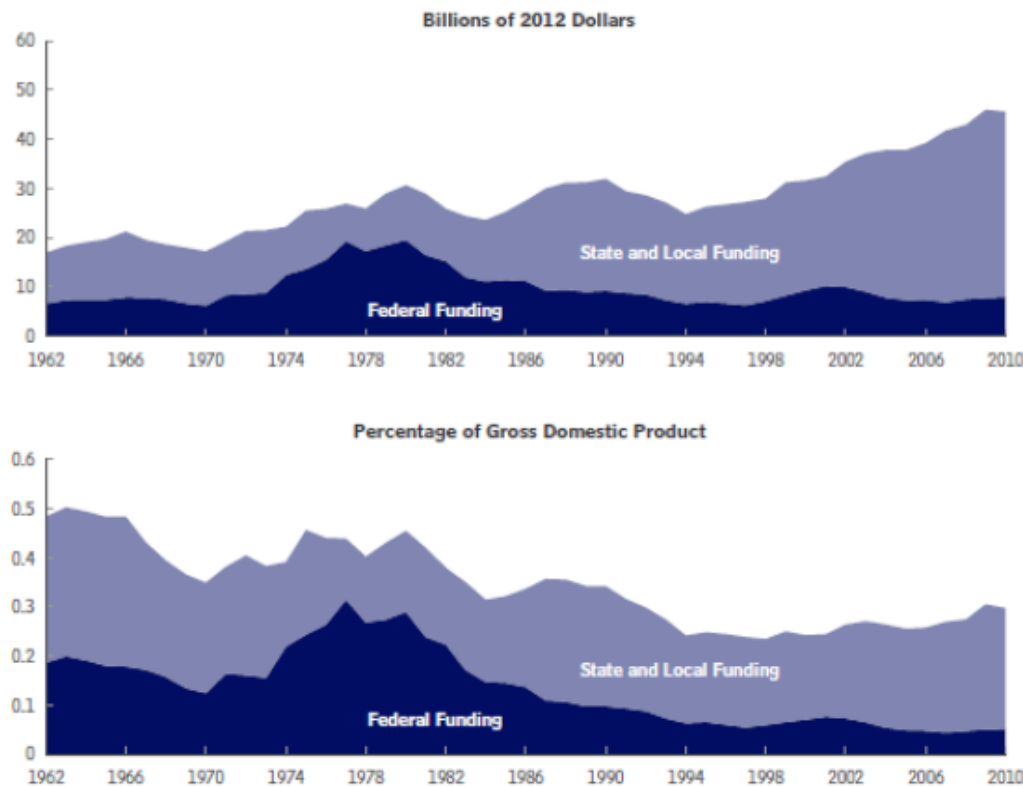
Nearly 70% of Kansans Rely on Reservoirs for Their Drinking Water Supply

These reservoirs are losing their capacity to fulfill their purposes: flood protection and drinking-water supplies, as well as recreational uses.

**HOW WILL KANSAS FUND NEEDED
INFRASTRUCTURE IMPROVEMENTS AND
WATERSHED CONSERVATION PRACTICES?**

Water Infrastructure Spending

Water Infrastructure: Sources of Nondefense Investment, 1962 to 2010



Source: Congressional Budget Office based on data from the Office of Management and Budget, the Census Bureau, and the Bureau of Economic Analysis. For details, see the appendix.

Between 1962 to 2010:

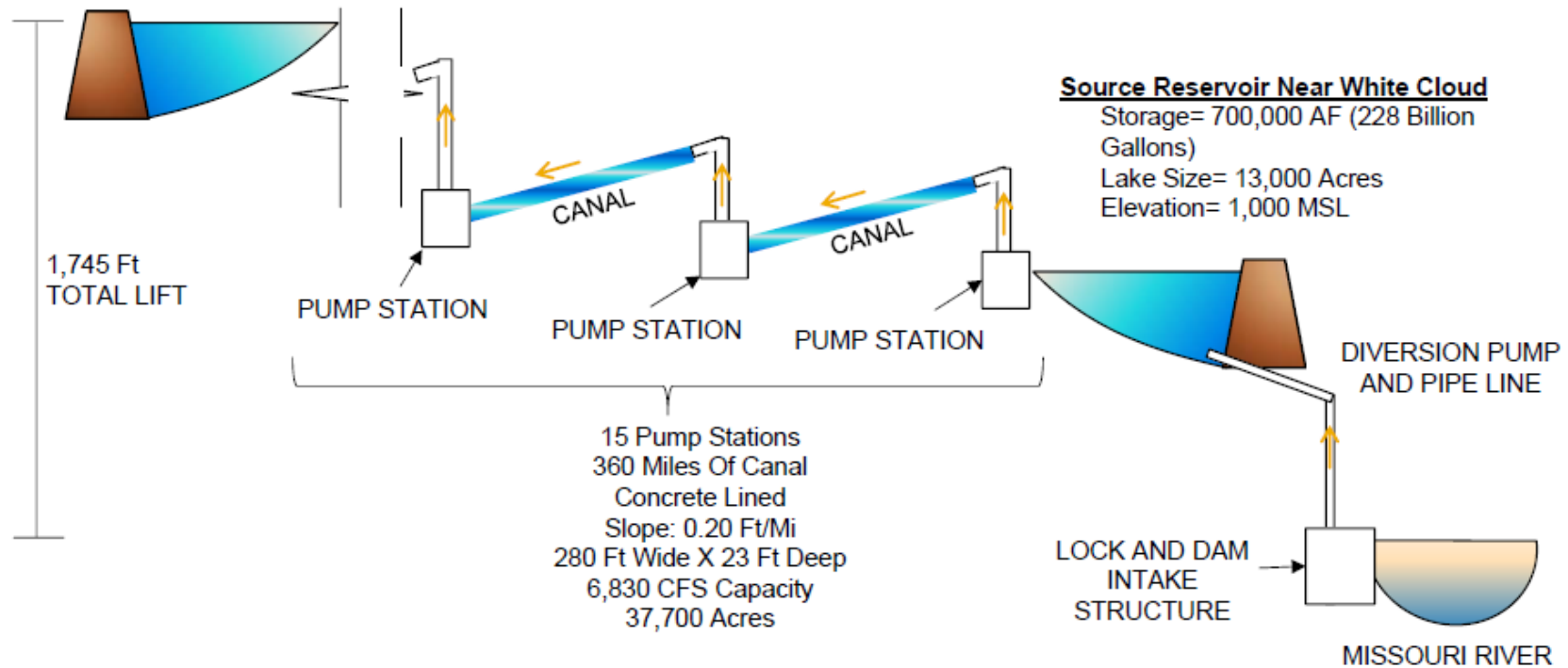
- Total funding **increased**
- % GDP **decreased**
- Greater burden on state and local funding sources as infrastructure ages.

Kansas Aqueduct Schematic

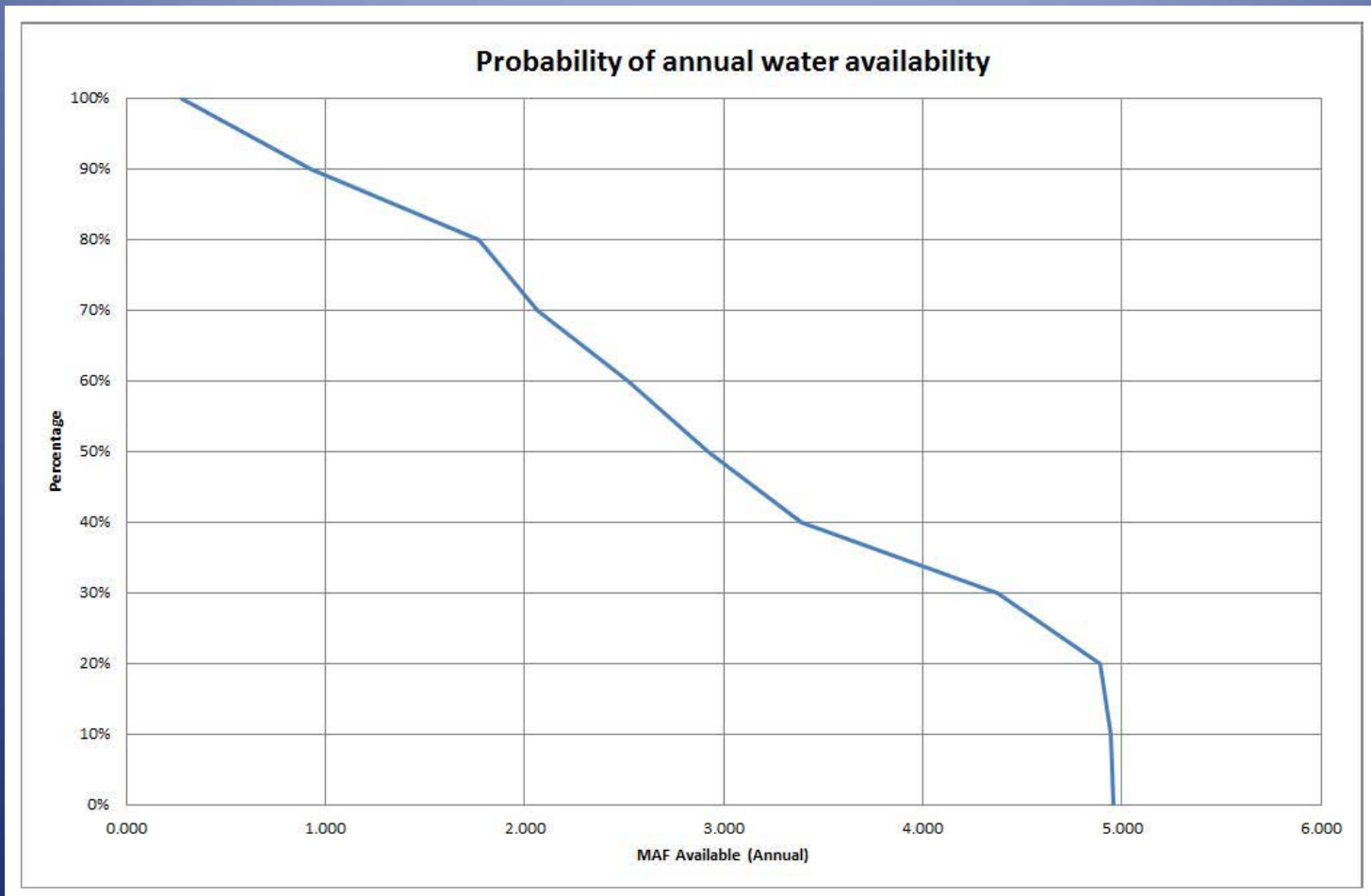
(Maximum Demand Sizing From 1982 Study)

Terminal Reservoir Near Utica

Storage= 1,586,000 AF (517 Billion Gallons)
Lake Size= 25,000 Acres
Elevation= 2,610 MSL
Delivery= 3.4 Million Acre Feet per Year



KWO Chart showing probability of the amount of water available to be diverted from the Missouri River



Are there better alternatives?

- Can we begin to move toward more sustainable farming systems that are less reliant on irrigation in Kansas?
- Corn for ethanol has raised the price of food and it is only 2/3 as efficient as petroleum products.
- What are the effects on humans of bee-killing chemicals that are showing up in water-quality sampling?

“Ogallala Road: A Memoir of Love and Reckoning”

Julene Bair, author, daughter of KS irrigator

In place of corn subsidies, the government should provide generous financial incentives for a return to dryland crops and grazing. This is where Kansas agriculture is headed regardless -- the only choice being between a soft landing now and a crash landing later. If both the state and federal governments continue to encourage farmers to pump water until it is gone, the farmers will have no way of supplementing their dryland crops during droughts or increasingly hot summer weather. A water plan that truly comes to grips with this truth could keep thousands of farms from going bankrupt and taking the Kansas economy along with them.

Kansas Rural Center Comments on the 50-Year Vision for Water

KRC believes that the vision should include protection of the natural resource base because

this is critical in making decisions for the long-term. If not protected, there will be no long-term.

**Kansas Health Foundation Comments
on the 50-Year Vision for Water
August 2014**

**The Foundation respectfully
asks that public health
be reflected in the vision
for water in Kansas.**

2013 State of the Birds

Conclusion:

Sustainable working lands can meet the economic bottom line while providing habitat for birds and cleaner water, cleaner air, and improved human health for communities.

A More Holistic Approach

Kansas' Vision for the Future of Water should not be limited to supply only. Water does not exist in a vacuum. The Vision must take into consideration the context in which water occurs. In addition to agricultural needs, human health and water-quality concerns, we should also be looking at enhancing opportunities for water-based wildlife recreation: hunting, fishing, birding, etc.

Healthy Habitats for People and Wildlife



**Healthy Plants
and Soils**

Clean Air



**Clean
Water**



Lower Arkansas Basin 2006 Reported Water Use by Type

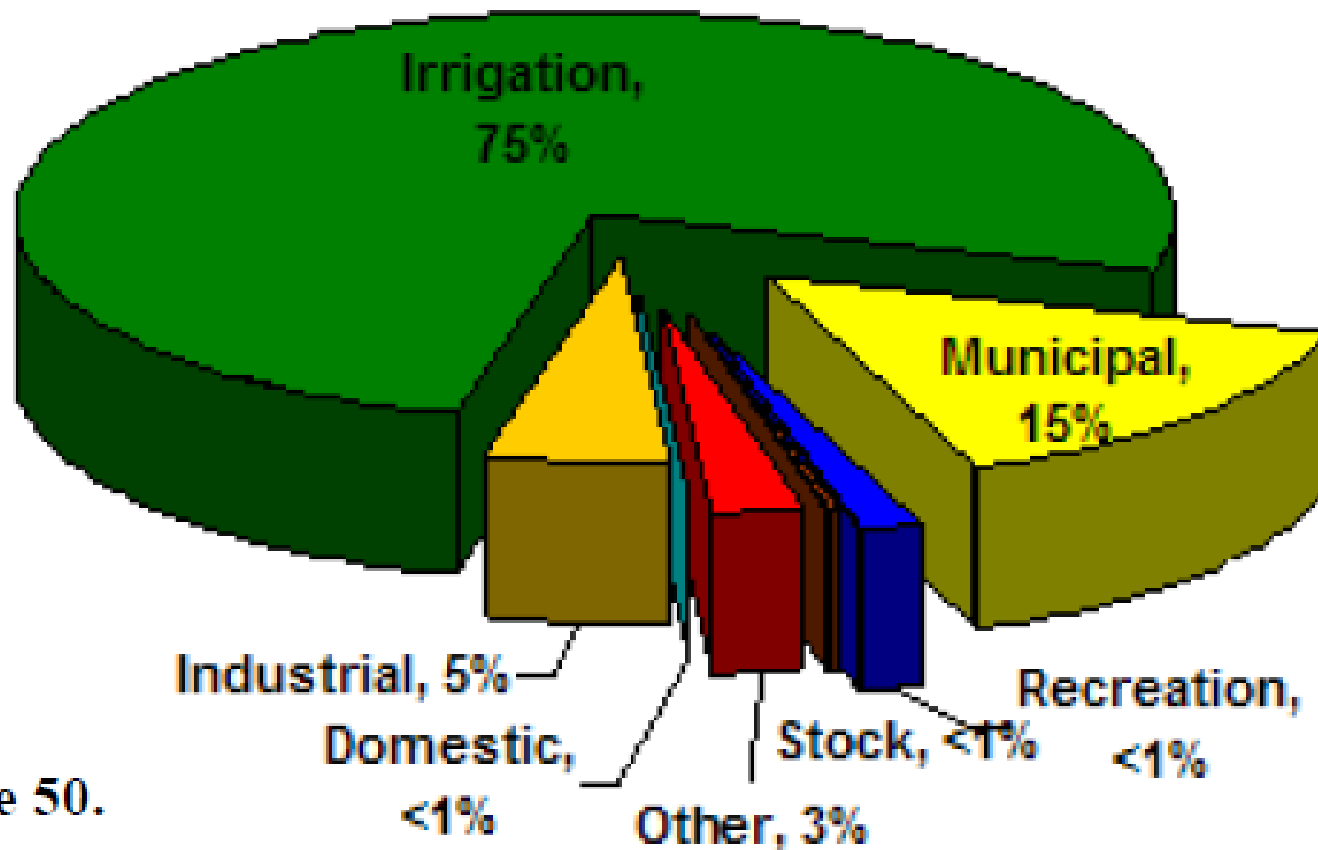
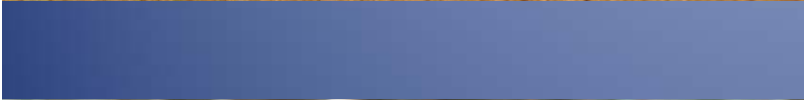


Figure 50.



Irrigated Cropland in Southwest Kansas

