

MINUTES OF THE HOUSE AGRICULTURE AND NATURAL RESOURCES COMMITTEE

The meeting was called to order by Chairman John Faber at 3:30 P.M. on January 30, 2007 in Room 423-S of the Capitol.

All members were present.

Committee staff present:

Raney Gilliland, Kansas Legislative Research Department
Jason Thompson, Revisor of Statutes
Florence Deeter, Committee Assistant

Conferees appearing before the committee:

Constantine Cotsoradis, Deputy Secretary, Kansas Department of Agriculture
Rod Winkler, United States Department of Agriculture, Farm Services Agency
Tracy Streeter, Director, Kansas Water Office
Don Whittemore, Kansas Geological Survey, University of Kansas

Others attending:

See attached list.

It was noted that committee minutes dated January 23 and 24, 2007, were sent electronically, and, by consensus, were approved as written on January 30, 2007.

The Chairman recognized Representative Otto, who requested the introduction of a bill to repeal the Kansas endangered species act. Duane Simpson was also recognized, who requested the introduction of a bill to restrict the use of ammonium nitrate fertilizer, treating it similar to restricted pesticide. There being no objections, the bills will be introduced.

Briefing on the Conservation Reserve Enhancement Program

The Chairman introduced Raney Gilliland, Kansas Legislative Research Department, who gave background information on the Conservation Reserve Enhancement Program, saying that this program targets irrigated lands primarily in the Arkansas River area (Attachment 1). Appropriations proviso for **HB 2968**, (from the 2006 legislative session) has to do with the budget for the State Conservation Commission. Two conditions in the proviso pertain to the retirement of water rights: that no monies appropriated for fiscal year 2007 be used unless a bill is passed by the Legislature during the 2007 session, and that a program for the retirement of water rights designed by the State Conservation Commission and the Kansas Water Office has been presented to both the House and Senate. Mr. Raney said the dismissal of water rights is a Kansas policy only.

Rod Winkler, from the Farm Services Agency, U. S. Department of Agriculture, gave a power-point presentation outlining the purpose of the Conservation Reserve Enhancement Program (CREP) (Attachment 2). He explained the involvement of the Conservation Reserve Program (CRP) within the bounds of CREP, the goals and partnerships of Kansas CREP, and the shared federal commitment of eighty percent of funds allocated. Kansas is the fourth largest state in terms of numbers of acres enrolled in CRP. Kansas landowners receive approximately \$104 million annually. Mr. Winkler gave an example of the annual rental payment on dryland acres paid over a period of ten years, and included the cost-share assistance portion to portray the total amount of money involved.

Tracy Streeter, Director, Kansas Water Office (KWO), demonstrated with a slide presentation how water is used in Kansas and why the CREP program will benefit the Arkansas River Valley (Attachment 3). If initiated, the proposal could reduce consumption of about 140,000 acre feet of water usage in the upper Arkansas River. Monies deposited in the Water Plan Fund from the Colorado settlement account can be leveraged. Nebraska instituted an irrigation rental plan which are being considered for use in Kansas. One major issue is the permanent retirement of water rights. In addition, the economic impact needs to have priority consideration in this program.

Representative Larry Powell distributed information for the committee members in respect to data of non-

CONTINUATION SHEET

MINUTES OF THE House Agriculture and Natural Resources Committee at 3:30 P.M. on January 30, 2007 in Room 423-S of the Capitol.

federal in-kind and direct contributions for the CREP (Attachment 4), and the economic activity in various Kansas counties (Attachment 5).

Don Whittemore, Kansas Geological Survey, University of Kansas, provided information regarding hydrologic responses to pumping water in the Upper Arkansas Basin and the effects of the CREP (Attachment 6). He stated that the ground-water levels will decline significantly unless reduction of pumping is put in place. Of concern to Kansans is that the flow of water coming from Colorado is becoming one of the most saline rivers in the United States. This salinity affects the fresh water in the aquifers, and saline ground water moves outward from the river. Mr. Whittemore advocated that the goals set forth in the CREP could extend the usable lifetime of the aquifer, which would benefit ground-water management in downstream creeks.

The Chairman said that the sub-committee report will be announced tomorrow.

The meeting was adjourned at 5:30 p.m.

HOUSE AGRICULTURE COMMITTEE GUEST LIST

DATE: January 30, 2007

NAME	REPRESENTING
Don Whittamore	Kansas Geological Survey
Susan Stover	Kansas Water Office
Joe Fund	Kansas Water Office
Tom Brown	Farm Credit
Kim Christensen	KWO
Mark Heim	SCC
Rand Astren	KFB
Bob Winkler	FSA
Dana Peterson	Ks Assoc of Wheel Hoes
Joan Dahn	KFY
SEAN MILLER	
Alex Zanna	SIERRA CLUB
Katie Firebaugh	Keamney & Associates
Scott Cah	SCC
Steve Swaffar	KFB
GREG FOLEY	SCC
Rex Buchanan	Ks. Geological Survey
Mike Beam	Ks. Livestock Assn.
Mary Jane Stankiewicz	KGFAL KARA

Tom
Thompson
+ Associates

Jesse Kaufman
Tom Thompson

Ks Co-op Council
Sierra Club

CV Cotsoadis
KDA

Steve Adams

Wildlife + Parks

RANEY Gillilan

Sec. 20.

STATE CONSERVATION COMMISSION

(a) There is appropriated for the above agency from the state water plan fund for the fiscal year or years specified, for the following water plan project or projects specified, the following:

- Irrigation water use reductions
- For the fiscal year ending June 30, 2007. \$786,268
- Conservation reserve enhancement program
- For the fiscal year ending June 30, 2007. \$4,588,429

(b) There is appropriated for the above agency from the state general fund for the fiscal year or years specified, the following:

- Conservation easements
- For the fiscal year ending June 30, 2007. \$311,500

Provided, That expenditures shall be made from the conservation easements

account for the United States department of defense army compatible use buffer program: *Provided, however*, That, after moneys have been expended or encumbered from the conservation easements account for the United States department of defense army compatible use buffer program, any unencumbered balance remaining in the conservation easements account may be expended for the United States department of agriculture natural resources conservation service farm and ranch lands protection program.

(c) During the fiscal year ending June 30, 2007, no moneys appropriated for the state conservation commission from the state general fund or any special revenue fund for fiscal year 2007 by this or other appropriation act of the 2006 regular session of the legislature, or by any appropriation act of any special session of 2006 of the legislature, shall be expended for fiscal year 2007 for a conservation reserve enhancement program unless (1) a substantive bill authorizing and prescribing the administration of a conservation reserve enhancement program, including the requirement that the state conservation commission and the Kansas water office prepare a program for the retirement of water rights under the conservation reserve enhancement program and present such program for the retirement of water rights to the senate committee on natural resources and the house committee on environment, is passed by the legislature during the 2007 regular session, or during any special session of 2006 of the legislature, and enacted into law; and (2) such program for the retirement of water rights has been presented to the senate committee on natural resources and the house committee on environment during a regular or special session of the

legislature.

(d) On July 1, 2006, the amount of the unencumbered balance in the state water plan fund on June 30, 2006, is hereby appropriated for fiscal year 2007 to the conservation reserve enhancement program account of the state water plan fund of the state conservation commission: *Provided*, That the amount appropriated by this subsection for fiscal year 2007 from the state water plan fund in the conservation reserve enhancement program account of the state water plan fund of the state conservation commission shall not exceed \$411,571.



Conservation Reserve Enhancement Program (CREP)

Kansas Farm Service Agency

Kansas Farm Service State Office
Manhattan, Kansas
785-539-3534



CREP - Part of the Conservation Reserve Program - CRP

- ✓ CRP – Voluntary Natural Resource Program
- ✓ Protects water quality, reduces soil erosion
- ✓ Enhance wildlife populations, restores wetlands
- ✓ Nations largest private lands conservation program
- ✓ Over 36 million acres voluntarily protected



Conservation Reserve Program - Kansas

- ✓ Total enrolled acres – 3,104,394
- ✓ Kansas CRP contracts – 48,000
- ✓ Average rental rate - \$39.03
- ✓ \$104 million Annual Rental Payments



CRP Contract Enrollment

- ✓ General Enrollment
- ✓ Continuous Enrollment
- ✓ CREP



CREP GOALS

Create an opportunity where the resources of a State and Federal Government can be targeted to address specific conservation and environmental objectives in a coordinated manner.



Kansas CREP Goal

Sustain the resources of the Upper Arkansas River Valley including regional ground water and wildlife by reducing water quantity shortages in a voluntary and cost effective manner.



CREP Partnership

- ✓ 80 Percent Federal
- ✓ 20 Percent State



Federal Commitment – How it Works!

- ✓ Voluntary CRP Contracts
- ✓ Cost-share Assistance for Cover Establishment
- ✓ Signup Incentive Payments



Federal Commitment

✓ Voluntary CRP Contracts

- 14 to 15 year contract length
- 85,000 acres Irrigated Rental Rates
- 15,000 acres Dryland Rental Rates
- Target 100,000 acres
- \$151 million estimated rental payments
- Continuous Signup – County FSA Office
- Signup Flow Chart – Coordinate Partners



Federal Commitment

✓ Cost-Share to Establish Cover

- Participant selects practice
- Develops Conservation Plan
- 50 percent of cost
- \$3.8 million estimated cost



Federal Commitment

✓ Incentive Payments

- Signup Incentive Payment
- Practice Incentive Payment
- \$161,212 Estimated Cost



Federal Commitment

✓ Signup Incentive Payment

- \$10/acre for each year of contract
- Limited to 10 years
- Available on practices:
 - Shallow Water Areas
 - Filter Strips
 - Riparian Buffers



Federal Commitment

- ✓ Practice Incentive Payment
 - Additional 40% cost-share on cover establishment
 - Available on Practices:
 - Filter Strips
 - Riparian Buffers



Eligible Practices – Estimated Acres for Enrollment

✓ Native Grass	93,000 acres
✓ Wildlife Habitat	2,000 acres
✓ Shallow Water Areas	1,000 acres
✓ Already Established Cover	2,000 acres
✓ Filter Strips	500 acres
✓ Riparian Buffers	500 acres
✓ Wetland Restoration	1,000 acres



EXAMPLE

- ✓ 160 Acres – 127 Irrigated, 33 acres Dryland
- ✓ Annual Rental Payment
 - 127 ac. x \$112 x 15 yrs. = \$213,360
 - 33 ac x \$33 x 15 yrs. = \$16,335
- ✓ Cost-Share Assistance
 - 160 ac. @ \$50/ac. = \$8,000
- ✓ Total Federal - \$237,695



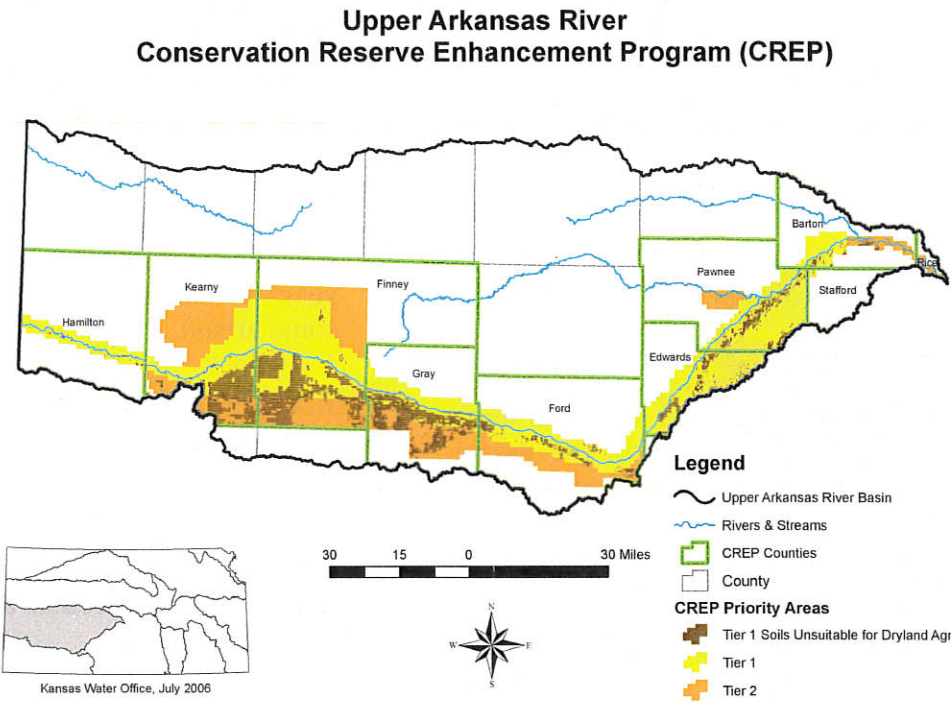
Upper Arkansas River

Conservation Reserve Enhancement Program (CREP)



A voluntary incentive
program to conserve water
resources

Conservation Reserve Enhancement Program (CREP)



Project priority area for the proposed voluntary
Upper Arkansas River CREP

Conservation Reserve Enhancement Program (CREP)

What is CREP?

CREP is a type of Conservation Reserve Program (CRP) that combines federal and state dollars to target significant agricultural conservation needs.

Kansas has a goal of enrolling 100,000 acres (85,000 irrigated and 15,000 dryland corners) along the Upper Arkansas River into the CREP program.

Irrigators who sign up for the CREP would receive an annual rental payment for planting grass or other non-crop vegetation, and permanently retiring the associated water right.



Arkansas River at Dodge City

Why does Kansas need a CREP?

- Declining water levels in the High Plains Aquifer
- Loss of streamflow and baseflow in the Arkansas River
- Degradation of both ground and surface water quality

- Degradation of riparian health and wildlife habitat

Who can participate?

- Producers with water rights in good standing located within the CREP boundaries
- Producers that meet the minimum eligibility criteria
- Water right must be permanently retired (limited irrigation permitted for 2 years to establish cover in some areas)

"We'll never have a better opportunity to try to make a difference in the sustainability of water resources in the Upper Arkansas River Valley" - Tracy Streeter, Director, Kansas Water Office

What are the advantages for the producer?

- Upfront signup incentive payment by State for each irrigated acre enrolled
- Annual irrigated rental and maintenance payments
- 50% cost share on seeding
- Cost share on well plugging
- Land can be leased for hunting
- Secure revenue source for up to 15 years

What are the benefits to the region?

- Sustain water resources along the Arkansas River Valley
- Reduce water quantity shortages. Program could potentially conserve ~149,000 AF/annually
- Improve water quality, protect the sources of public water supplies, and improve wildlife habitat
- Maximize state funds available to leverage into millions with federal dollars

How and When?

- If approved, enrollment will begin mid-2007
- Administered through Farm Services Agency (FSA) and State Conservation Commission (SCC)
- Rental rates still to be determined
- Program needs to be approved by 2007 Kansas Legislature and Governor

The Kansas CREP is about arming producers with options for the management of their resource. "Farmers should be free to choose if this program is right for them" - Steve Irsik, Chairman, Kansas Water Authority

Who Supports CREP?

- Kansas Farm Bureau
- Kansas Livestock Association
- Pheasants Forever
- Nature Conservancy
- Arkansas River Coalition
- Kansas Association of Conservation Districts
- Kansas Water Authority
- Southwest Kansas Groundwater Management District #3
- Big Bend Groundwater Management District #5
- Arkansas River Litigation Funds Committee
- Kansas Department of Agriculture
- Kansas Department of Wildlife and Parks
- Kansas Forest Service
- Kansas Department of Health and Environment
- Kansas Groundwater Management District Association
- State Conservation Commission
- Gray County Commission
- Kansas Water Office

Upper Arkansas River Conservation Reserve Enhancement Program

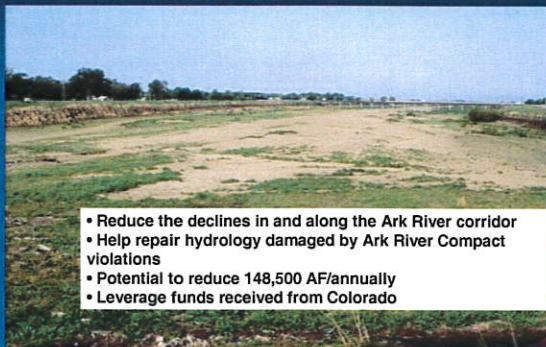


Tracy Streeter
Kansas Water Office

Upper Arkansas River Conservation Reserve Enhancement Program (CREP)

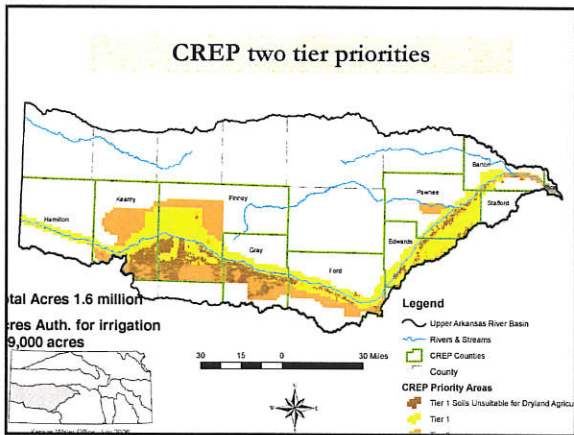
- A type of CRP
- Administered by Farm Service Agency
- Local/State/Federal Partnership
- Protect or restore natural resources
 - Water quantity, water quality, wildlife habitat
- Voluntary Program
- Maximum Size: 100,00 acres

Why the Upper Arkansas River?



- Reduce the declines in and along the Ark River corridor
- Help repair hydrology damaged by Ark River Compact violations
- Potential to reduce 148,500 AF/annually
- Leverage funds received from Colorado

Arkansas River at Dodge City



- Upper Arkansas River CREP basics:**
- Irrigated cropland eligible for enrollment
 - Estimate 85,000 acres
 - Dryland corners eligible with whole field enrollment – estimate 15,000 acres
 - Seeding and signup payments
 - Annual payments for 14-15 years
 - Permanent dismissal of water right
 - 1-2 years limited irrigation to establish cover
 - Minimum use criteria (State and Federal)

- Flexibilities proposed in CREP**
- Allow managed haying that includes partial field mowing & baling on suitable CREP acres.
 - Air quality benefits of grasses may allow credits for carbon sequestration (~0.75 metric ton CO₂/acre)
 - Amend Kansas CREP to allow dryland farming if an option under future Farm Bill

**Potential Economic Impact of
100,000 acre CREP**

- County Taxes: CREP land taxed at dryland rate. Loss in 10 –county property tax: -\$400,005 or - 1.9%
- Direct annual loss: -\$8.7 million (agricultural production, minus additional income)
- Reduction in total economic activity in 10 county area: -0.1 to 0.2%

CRP Acres enrolled & expiring

	CRP Acres Expiring	Reenrollment up to 5 Years	% Cropland Acres Enrolled in CRP (2006)
Barton	10,083	7,803	4.89%
Edwards	21,565	21,236	11.24%
Finney	33,632	31,951	13.50%
Ford	22,474	20,128	13.24%
Gray	14,555	8,590	11.53%
Hamilton	131,283	121,308	29.77%
Kearny	48,602	43,770	16.47%
Pawnee	21,528	21,143	8.42%
Rice	7,570	7,517	4.25%
Stafford	22,109	16,928	12.48%
Total Acres:	300,374		

might come back into production

Estimated Total Program Costs

Source	Costs	Net Present Value Costs
Federal contributions	\$155,430,125	\$113,042,930
Non-federal contributions	\$44,269,074	\$44,269,074
<i>Total Project Costs</i>	\$199,699,199	\$157,312,004

State Costs:

a combination of one time \$\$ (from Colorado for Compact damages) and existing programs

- \$17.1 million in Cash:
 - \$5 million in payments to producers
 - CREP well plugging (\$600,000 over 5 years)
 - Kansas CREP Coordinator (over 15 years)
 - All other Cash is committed with or without CREP
- \$8.6 million in Technical Assistance
- \$18.5 million in State & Local In Kind Contributions

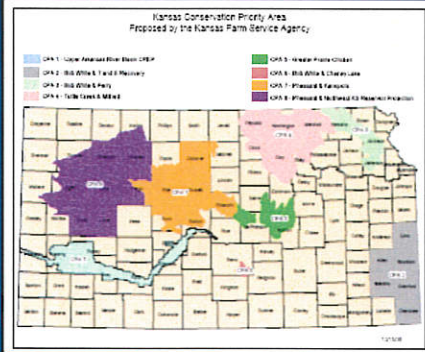
State Payments

- \$5 million payments on 85,000 irrigated acres
 - \$62/acre – Tier 1 (75,000 ac.)
 - \$35/acre – Tier 2 (10,000 ac.)
 - Lump sum – Up front
- \$1,000 cost-share for well plugging

Proposed Irrigated Rental Rates

County CREP Area	Flood Irrigation Rental Rate	Center Pivot Irrigation rental rate
Hamilton	\$95.00	\$104.00
Kearny	\$90.00	\$99.00
Finney	\$105.00	\$116.00
Gray	\$100.00	\$110.00
Ford	\$103.00	\$113.00
Edwards	\$105.00	\$115.00
Pawnee	\$100.00	\$110.00
Stafford	\$112.00	\$123.00
Barton	\$100.00	\$110.00
Rice	\$90.00	\$99.00

Conservation Priority Areas submitted to FSA National Office



Next Steps

- Negotiate with FSA details in proposal:
 - Competitive Irrigated Rental Rates
 - Cash contributions from State
 - Size of program
- Present negotiated details to State Legislature for review and approval, and pass state legislation on CREP
- Finalize and Sign Memorandum of Agreement between USDA and State of Kansas

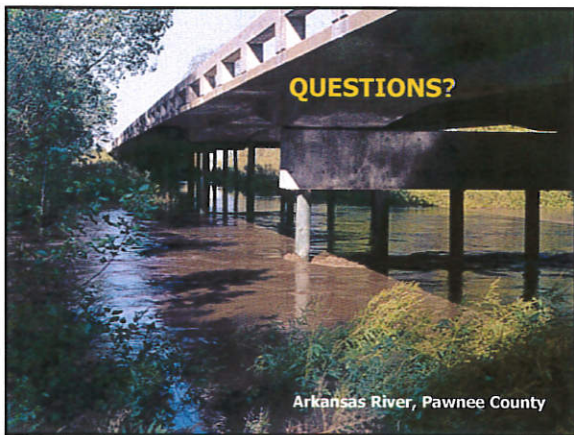


Table 9. Non-federal in-kind and direct contributions for the CREP

Agency and Program	Estimated Direct Costs (15 years)	Estimated Indirect Costs (15 years)
State SIP	\$5,000,000	_____
CREP Coordinator	\$1,305,000	_____
State Conservation Commission Cost Share	\$5,163,750	\$6,588,750
Water Conservation Project Fund	\$5,959,950	\$1,800,000
WCPF Project Manager	\$400,000	_____
Groundwater Management District #5	\$150,000	\$75,000
Groundwater Management District #3	_____	\$4,500,000
Kansas Department of Agriculture, Division of Water Resources	_____	\$6,000,000
Kansas Department of Health and Environment		\$150,000
Kansas Department of Wildlife and Parks		651,000
Kansas Forest Service	_____	\$90,000
Kansas Geological Survey	_____	\$1,530,000
Kansas Water Office	_____	\$1,485,300
Conservation Districts	_____	\$11,250
GIS Projects and Data Collection	_____	\$7,800
Total Non-Federal Contributions	\$17,978,700	\$22,889,100

CREP Supporters

Kansas Water Authority
 Upper Ark Basin Advisory Committee
 Kansas Livestock Association
 Kansas Farm Bureau
 KS Association of Conservation Districts
 Groundwater Management District No. 3
 Groundwater Management District No. 5
 Gray County Commission
 Ark River Litigation Funds Committee

Arkansas River Coalition
 Pheasants Forever
 Quail Forever
 The Nature Conservancy
 KS Forest Service
 KS Department of Agriculture
 Department of Wildlife and Parks
 Department of Health and Environment

USDA Response

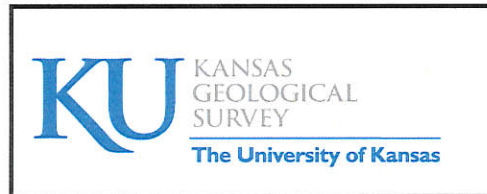
Last month, USDA provided feedback to the state on the proposal. Following is a summary of those comments:

Table D4. Estimated 15-Year Total CREP Direct and Total Economic Impacts to Finney County Production, Jobs and Income (2003\$)

Industry	Initial Impact	Total Output	Total Employment	Labor Income	Value Added
Ag, Forestry, Fish & Hunting	-\$75,670,635	-\$78,140,685	-34.1	-\$13,228,395	-\$40,994,820
Mining	\$0	-\$396,735	-0.1	-\$67,770	-\$194,805
Utilities	\$0	-\$122,565	0	-\$30,570	-\$100,980
Construction	\$0	-\$189,990	-0.2	-\$79,530	-\$86,670
Manufacturing	\$0	-\$2,045,115	0	-\$682,035	-\$1,141,560
Wholesale Trade	\$0	-\$611,835	-0.4	-\$260,610	-\$465,360
Transportation & Warehousing	\$0	-\$369,060	-0.2	-\$113,550	-\$160,365
Retail Trade	\$793,785	\$2,249,835	4.2	\$1,064,175	\$1,703,355
Information	\$0	\$144,645	0.1	\$28,605	\$56,325
Finance & Insurance	\$0	-\$5,085	0	\$15,435	\$17,010
Real Estate & Rental	\$0	-\$1,467,630	-0.9	-\$224,580	-\$1,021,065
Professional-Scientific & Technical Services	\$0	\$76,785	0.1	\$38,355	\$53,595
Management of Companies	\$0	\$25,095	0	\$8,415	\$10,950
Administrative & Waste Services	\$0	\$41,220	0.1	\$14,445	\$18,300
Educational Services	\$0	\$60,675	0.1	\$25,785	\$28,590
Health & Social Services	\$0	\$1,986,660	2.3	\$1,051,560	\$1,207,125
Arts- Entertainment & Recreation	\$0	\$100,050	0.2	\$32,430	\$54,885
Accommodation & Food Services	\$336,990	\$1,115,940	1.8	\$352,905	\$517,305
Other Services	\$0	\$326,235	0.8	\$191,400	\$229,950
Government & non-NAICs	\$0	\$1,758,480	-0.1	-\$61,545	\$1,551,555
Institutions	\$0	\$1,127,535	0	\$0	\$0
Household Income	\$32,846,100				
Total	-\$41,693,760	-\$74,335,545	-26	-\$11,925,075	-\$38,716,680

Hydrologic Responses to Pumping in the Upper Arkansas Basin and Effects of the Conservation Reserve Enhancement Program

A Briefing to the Kansas Legislature
House Agriculture and Natural Resources Committee
January 30, 2007



The photographs show the Arkansas River with very low flow in 2002 (left) and dry in 2005 (right) northeast of Larned. Many of the cottonwood trees along the river channel at this location have since died as a result of declining ground-water levels.

Sub-regional Areas of the High Plains Aquifer

6-2

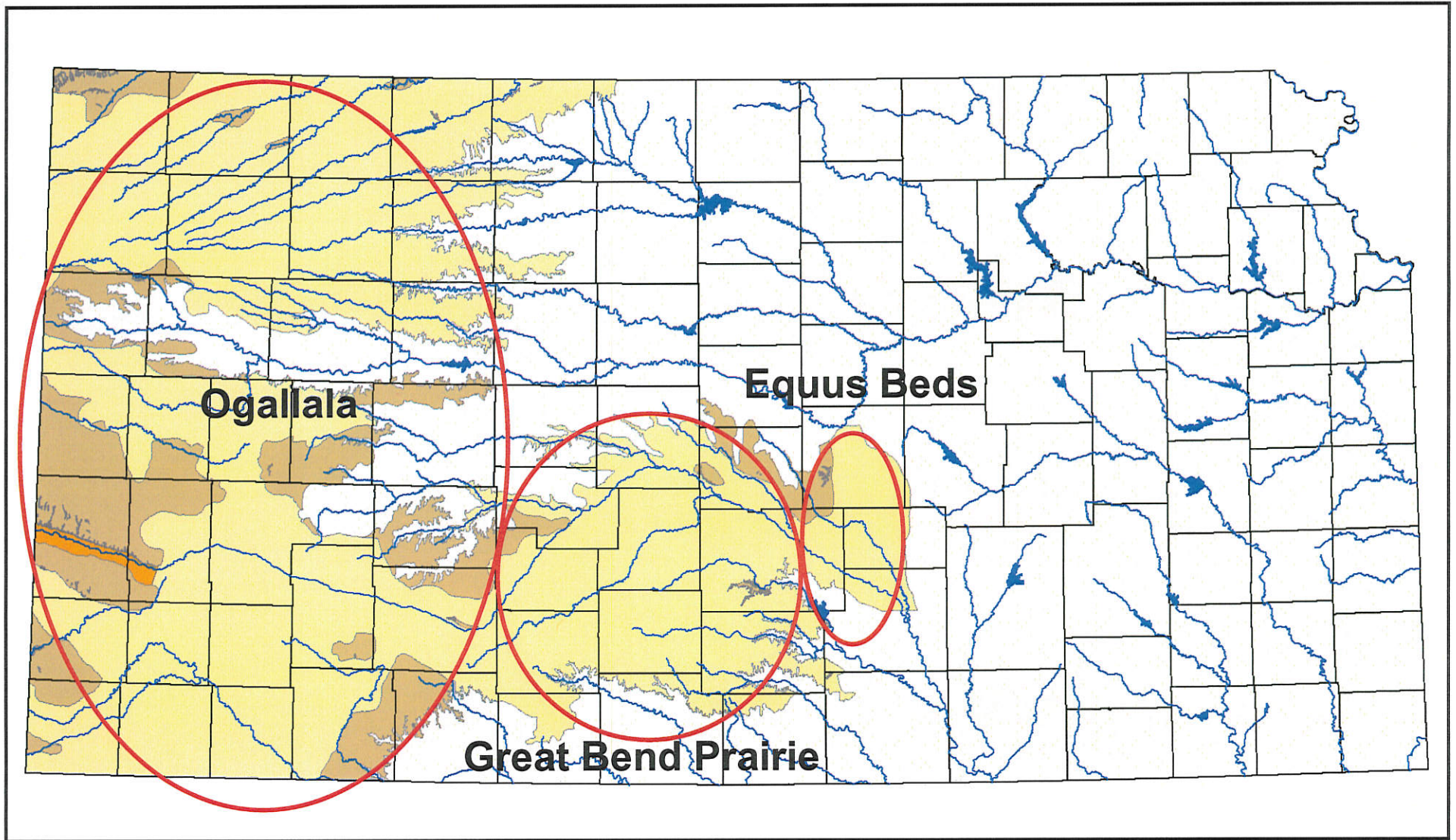


Figure 1 – Sub-Regional Areas of the High Plains Aquifer in Kansas. In Kansas, there are three sub-regions of the High Plains aquifer (the area in yellow) - the Ogallala, the Great Bend Prairie, and the Equus Beds. Ground water in the Great Bend Prairie and Equus Beds sub-regions of the aquifer is generally closer to the land surface (not as deep) and more responsive to recharge. Ground water in the Ogallala sub-region is generally deeper and, with less annual precipitation, has little natural recharge.

Upper Arkansas River Conservation Reserve Enhancement Program (CREP)

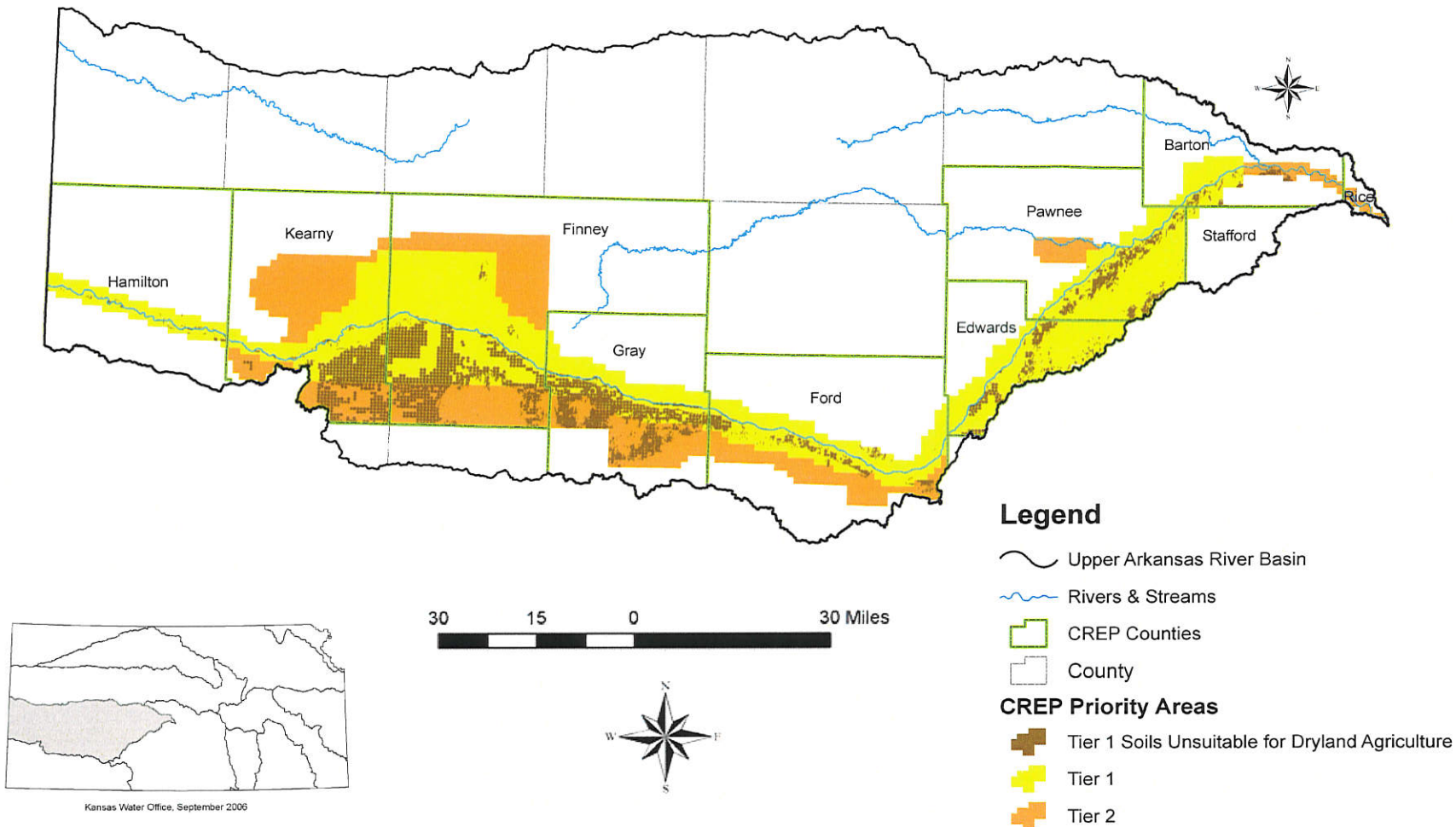


Figure 2 – CREP Area in the Upper Arkansas River Basin. The CREP area extends along the Arkansas River corridor from the Colorado-Kansas border to the southwest corner of Rice County. There is a large amount of ground water pumped for irrigation use within the proposed CREP boundaries. Part of the CREP area in Hamilton, Kearny, and Finney counties includes land irrigated with Arkansas River water.

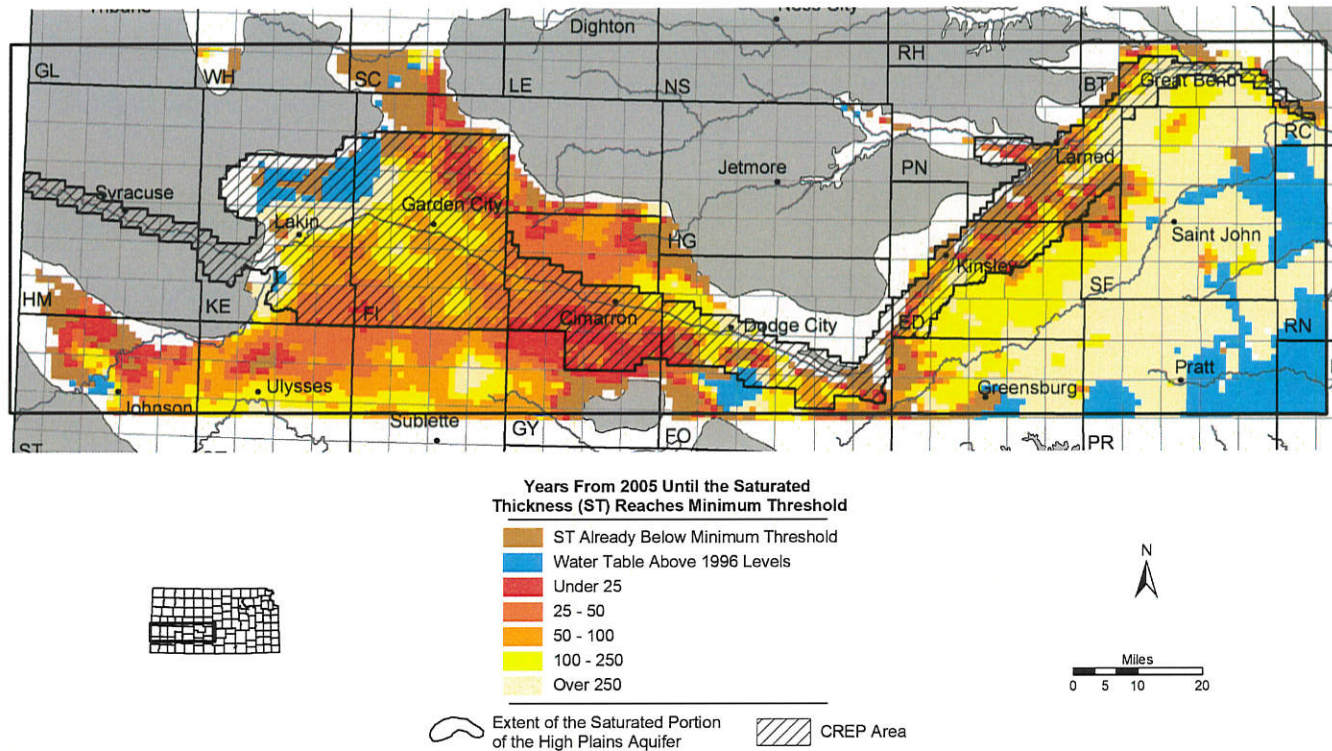
HYDROLOGIC RESPONSES TO FUTURE PUMPING IN THE UPPER ARKANSAS RIVER BASIN

- Ground-water levels will continue to decline unless there are substantial reductions in pumping.
- The aquifer will no longer be usable for large capacity wells in the future if water levels continue to decline at current rates.
- The water-level declines increase the rate of Arkansas River water loss into the aquifer in southwest Kansas and decrease the river flow reaching the Middle Arkansas subbasin.
- The Arkansas river flow from Colorado is saline. Thus, saline river-water seepage is increasing the salinity of the aquifer water.

Figure 3 – Summary of Hydrologic Responses to Future Pumping in the Upper Arkansas River Basin.

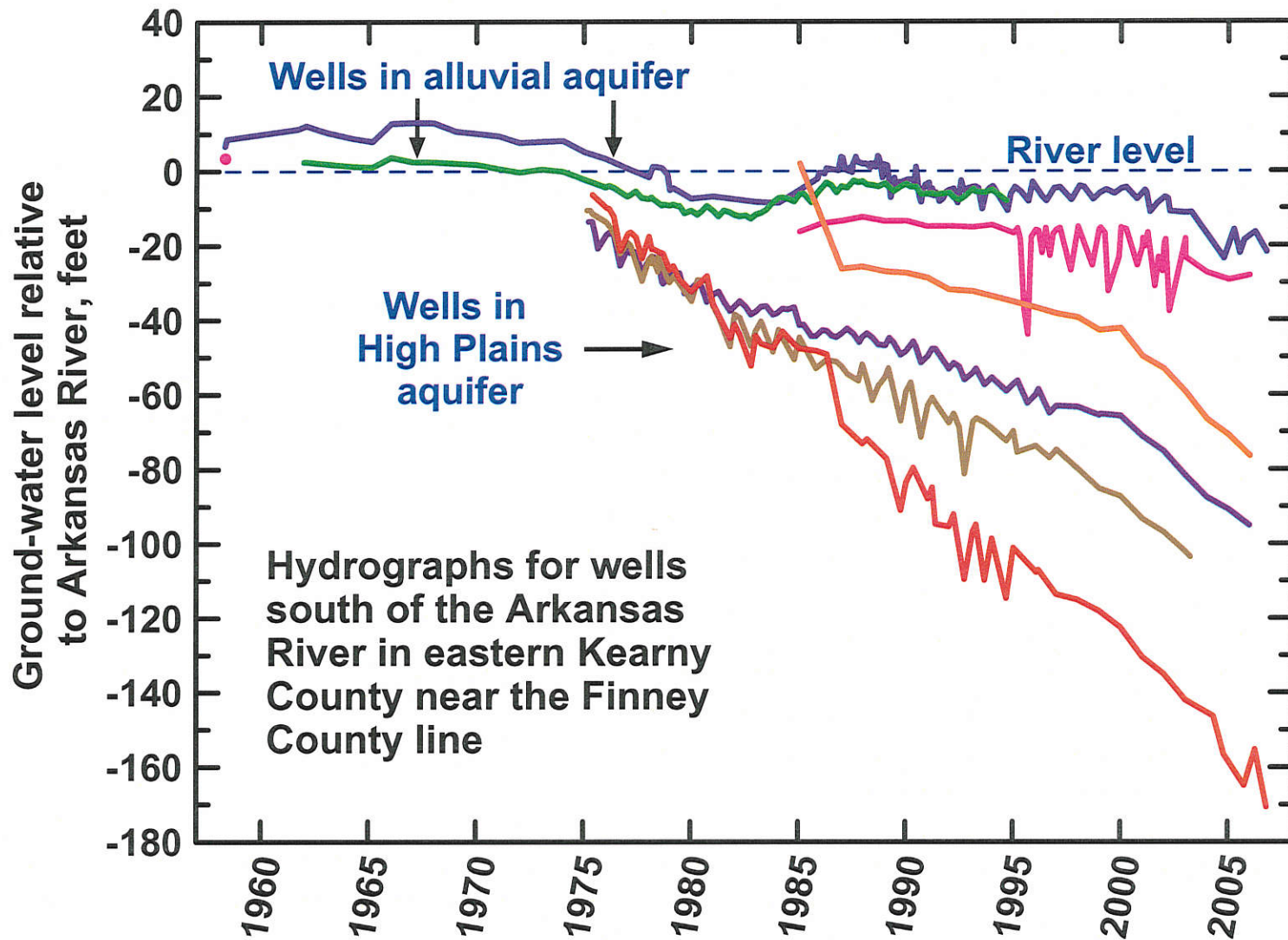
6-6

Estimated Usable Lifetime for the High Plains Aquifer in Kansas
 (Based on ground water trends from 1996 to 2006 and the minimum saturated thickness required to support well yields at 400 gpm under a scenario of 90 days of pumping with wells on 1/4 section)



CREP would extend the usable lifetime of the aquifer

Figure 5. Estimated Usable Lifetime of the High Plains Aquifer in the Proposed CREP Region. This map is an estimated projection (not a prediction) of how many years until the High Plains aquifer reaches a point where wells requiring 400 gpm extraction yields will begin to be impaired if ground-water level trends from 1996 to 2006 repeat continuously and unchanged into the future. The border of the CREP area is represented by a heavy black line. The projections based on the last 10 years of water-level records indicate that there are areas with less than 25 years of usable aquifer (the red areas) within the CREP borders. A substantial amount of the CREP area has a usable lifetime of less than 50 years. Some locations within the CREP border have already reached the limits of the usable lifetime based on the procedure used, meaning that pumping is limited to smaller rates than typically used for irrigation wells. Where water is currently being pumped from large capacity wells in these locations, future water-level declines will substantially impair the ability to operate these wells as before. The proposed CREP program would reduce the amount of water being pumped from the aquifer, thereby extending the usable lifetime of the aquifer and providing more time for implementation of additional management programs to further extend the aquifer life or achieve sustainable management.



Kansas Geological Survey

Figure 6 – Water-Level Changes in Wells near the Arkansas River in eastern Finney County. Water levels have declined in the High Plains aquifer and overlying alluvial aquifer next to the Arkansas River in southwest Kansas, shown here, for example, for eastern Kearny County near the Finney County line. The ground-water levels used to be at or above the water level of the river. In the 1970s the ground-water levels started to decline appreciably below the river level, causing river water to seep into the aquifer thereby decreasing streamflow. Unfortunately, the river water that Colorado sends Kansas is saline, meaning that freshwater in the aquifers is being becoming saline. In general, the water-level declines increase in a direction away from the river such that the saline ground water is moving at increasing rates outward from the river.

Sulfate Concentration in Ground Water in the Alluvial Aquifer in the Upper Arkansas River Corridor, Southwest Kansas

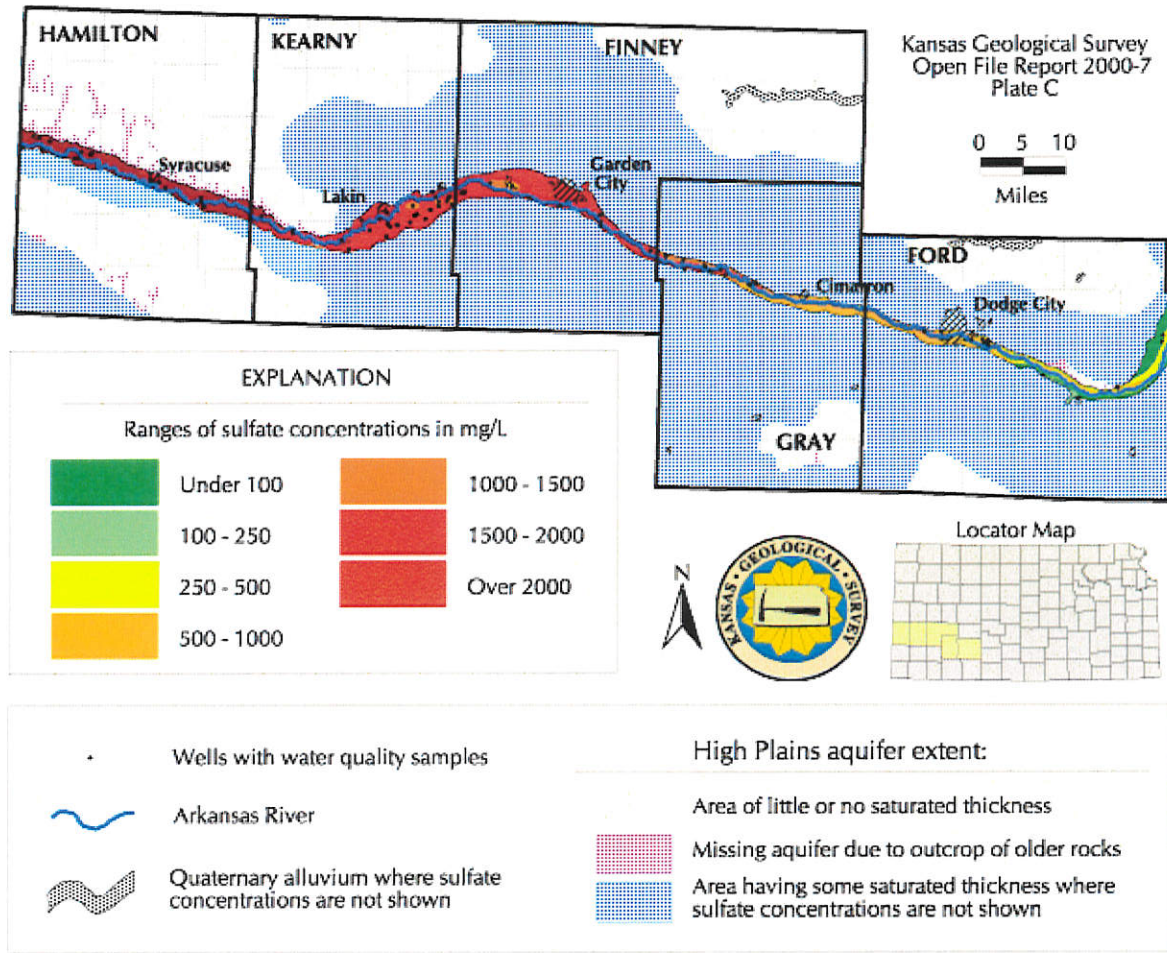


Figure 7 – Sulfate Concentration in Ground Water in the Alluvial Aquifer in the Upper Arkansas River Corridor in Southwest Kansas. The saline river water is very high in sulfate concentration. The recommended or secondary standard for drinking water is 250 mg/L. A substantial portion of the alluvial aquifer along the Arkansas River in southwest Kansas now contains water with over 1,000 mg/L sulfate concentration as a result of saline river water seepage.

Sulfate Concentration in Ground Water in the High Plains Aquifer in the Upper Arkansas River Corridor, Southwest Kansas

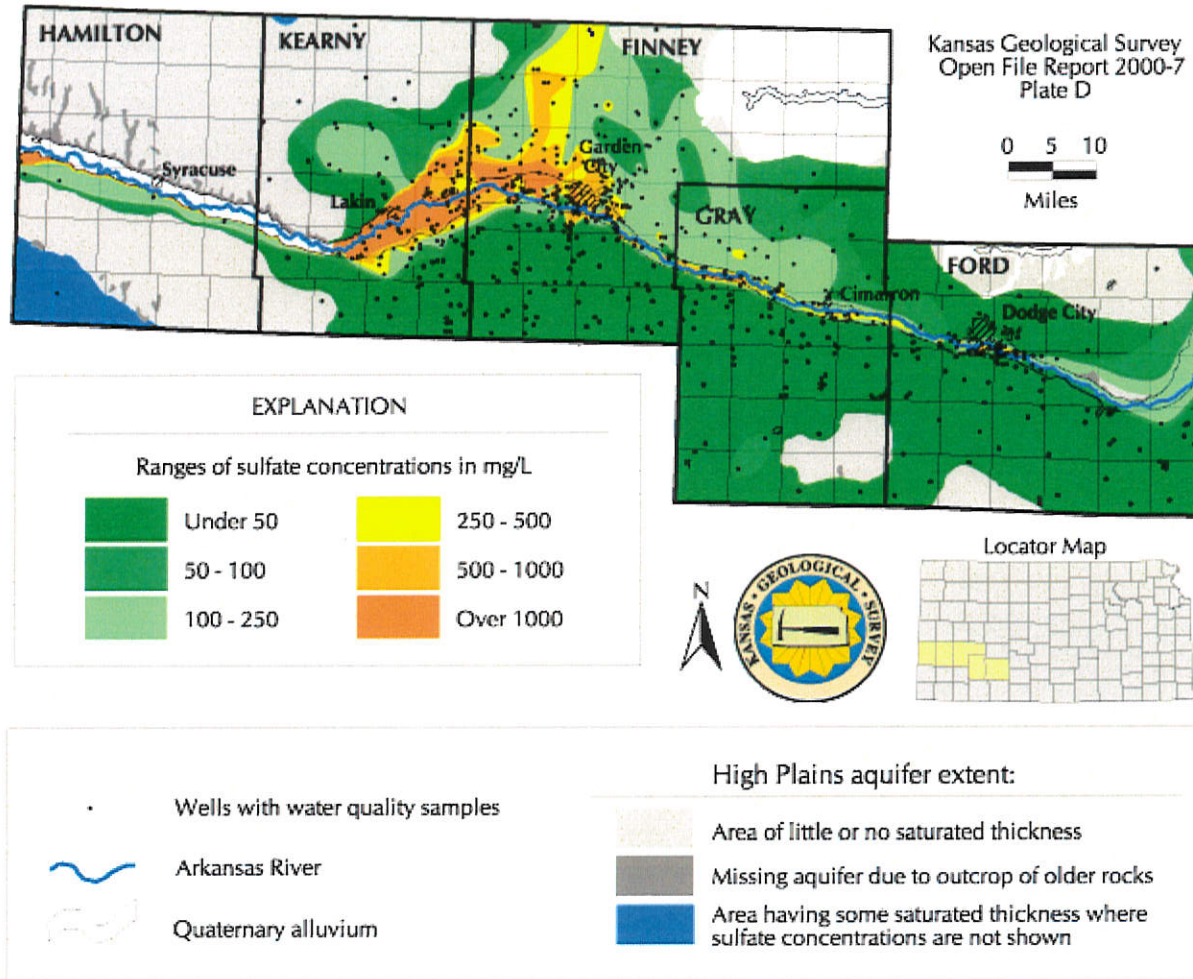
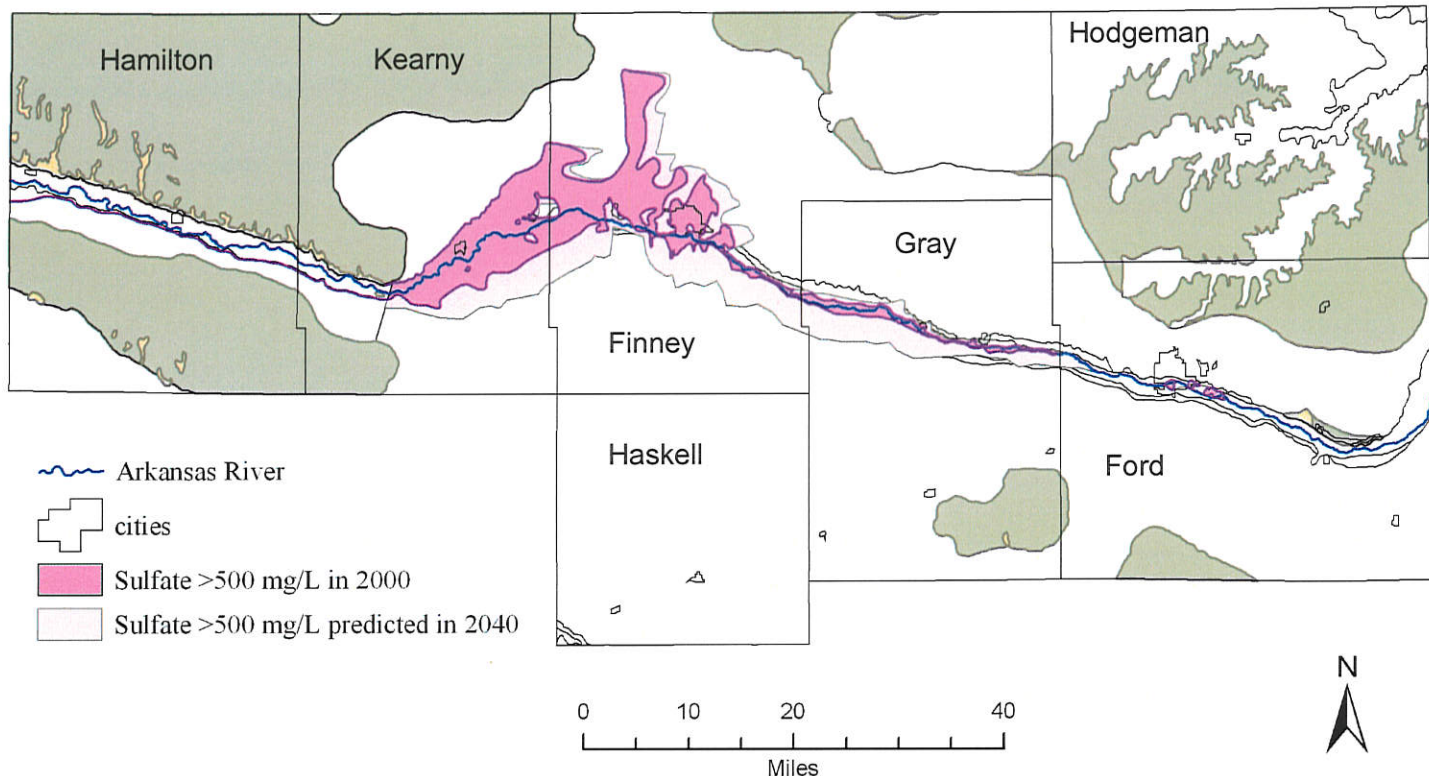


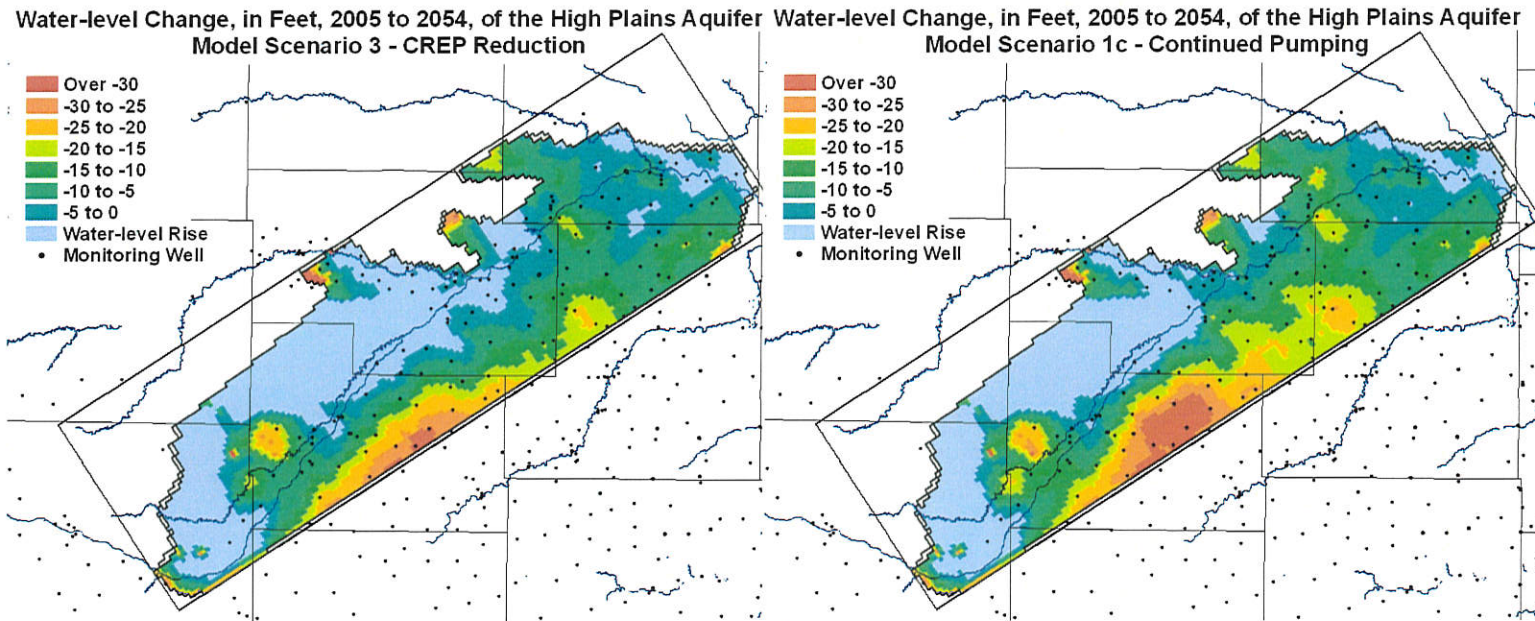
Figure 8 – Sulfate Concentration in Ground Water in the High Plains Aquifer in the Upper Arkansas River Corridor in Southwest Kansas.. A substantial portion of the High Plains aquifer in the Arkansas River corridor in Kearny and Finney counties now contains water with over 500 mg/L sulfate concentration as a result of saline river water seepage.



Predicted migration of saline ground water in the High Plains aquifer along the Arkansas River corridor in 2040 based on average 1990s water use

CREP would slow the rate of saline water migration

Figure 9 – Predicted Migration of Saline Ground Water in the High Plains Aquifer along the Arkansas River Corridor in Southwest Kansas. The prediction is based on a numerical model run in 2000 for the year 2040 based on average 1990s water use. The aquifer area with over 500 mg/L sulfate concentration in 2000 is shown in the darker pink shade. The additional aquifer area predicted to have greater than 500 mg/L sulfate by 2040 is represented by the lighter pink shade. This area is expected to completely cover the freshwater well field of Garden City south of the river. The proposed CREP would slow the rate of saline ground water migration.



Comparison of CREP Pumping and Continued-Pumping Scenarios for Numerical Modeling of the Middle Arkansas River Subbasin

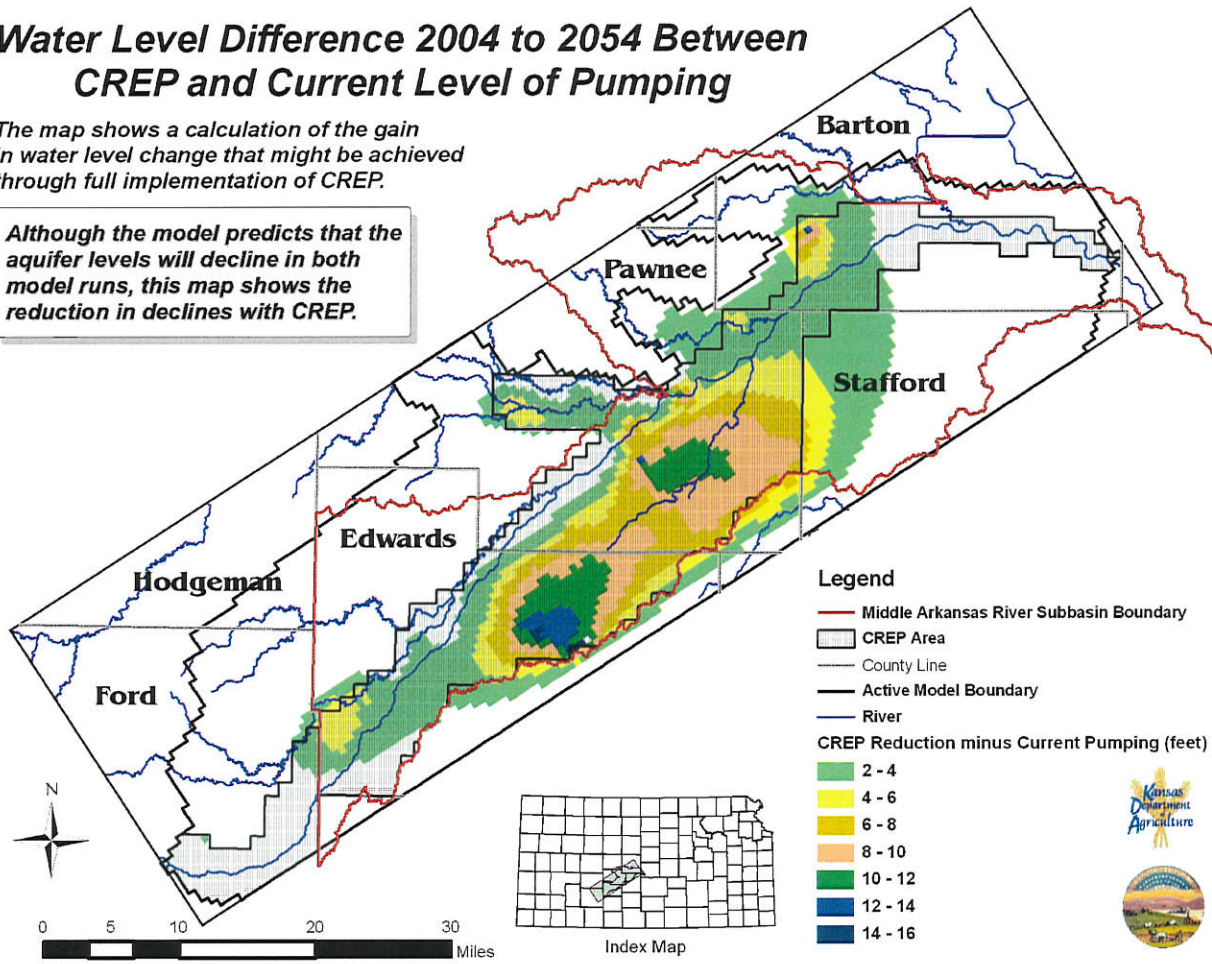
Kansas Geological Survey

Figure 10 - Comparison of CREP Pumping and Continued-Pumping Scenarios for Numerical Modeling of the Middle Arkansas River Subbasin. The Middle Arkansas River subbasin is located primarily in Edwards, Pawnee, Stafford, and Barton counties. A recent numerical model for the subbasin developed by the Kansas Geological Survey for the Kansas Water Office and the Kansas Department of Agriculture shows that water-level declines in the High Plains aquifer predicted for a CREP scenario (the left-hand figure) will be less than those for a scenario based on continued pumping at current rates. Note the smaller areas with large predicted water-level declines (areas in red and orange shades) in the CREP scenario in comparison with the continued-pumping scenario. Figure 11 shows the water-level difference between these two figures.

Water Level Difference 2004 to 2054 Between CREP and Current Level of Pumping

The map shows a calculation of the gain in water level change that might be achieved through full implementation of CREP.

Although the model predicts that the aquifer levels will decline in both model runs, this map shows the reduction in declines with CREP.



CREP would slow ground-water declines

Figure 11 – Water-Level Difference between the CREP Pumping and Continued-Pumping Scenarios for Numerical Modeling of the Middle Arkansas River Subbasin. The differences in the water-level declines for the CREP and continued-pumping scenarios are especially important where the aquifer has currently reached the limit of its usable lifetime or is projected to reach its usable lifetime within 50 years for typical high capacity wells (see Figure 5). The slowing of water-level declines in the High Plains aquifer within the CREP area will also be important to ground-water management in the adjacent Rattlesnake Creek subbasin to the southeast of the Middle Arkansas subbasin.

CREP would slow streamflow declines in the Middle Arkansas River subbasin

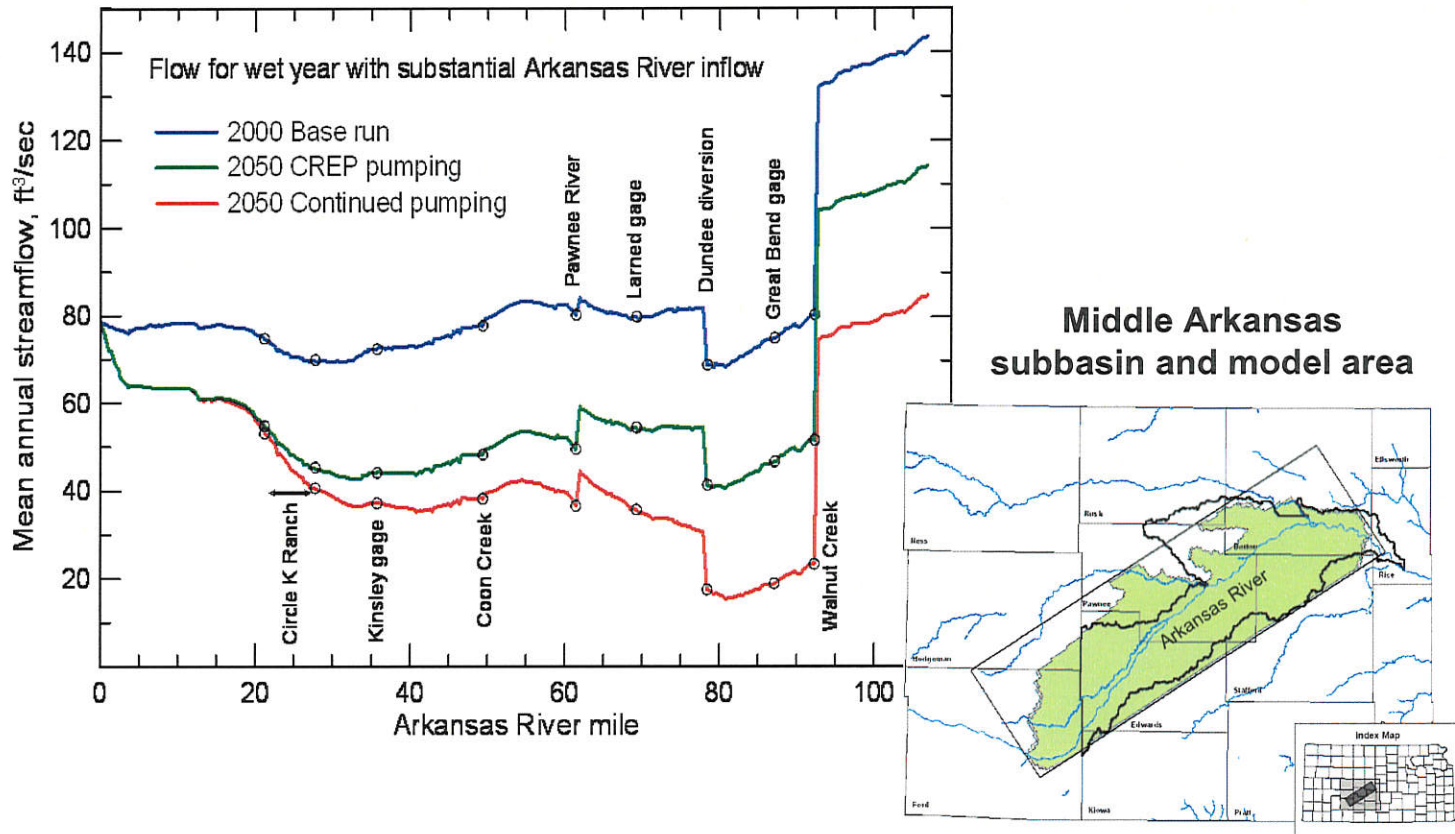


Figure 12. Decrease in Streamflow along the Arkansas River for the CREP and Continued-Pumping Scenarios Compared to a Wet Year with Substantial Flow. Arkansas River mile in the graph refers to the distance along the river channel starting at the beginning of the numerical model area (shaded in green in the inset map) in northeast Ford County and extending downstream to the end of the model area in southeast Barton County. The smaller streamflow declines in the CREP scenario would mean more water that could be diverted at the Dundee diversion to Cheyenne Bottoms during wet years than if current ground-water pumping continues in the subbasin. As shown in the right-hand photo on the title page, the Arkansas River is now usually dry upstream of the Dundee diversion.

Questions???

Kansas Geological Survey
University of Kansas
1930 Constant Ave, Lawrence, KS 66047

Visit our web sites at <http://www.kgs.ku.edu/>

High Plains/Ogallala Aquifer Information
<http://www.kgs.ku.edu/HighPlains/index.htm>

Upper Arkansas River Corridor Study
<http://www.kgs.ku.edu/Hydro/UARC/index.html>

Numerical Model of the Middle Arkansas River Basin
http://www.kgs.ku.edu/HighPlains/mid_ark_model.htm

Upper Arkansas Basin CREP Education
http://www.kgs.ku.edu/HighPlains/wraps_crep.htm

