

# **A Dying River—Historical Transformation in the Arkansas River, Western Kansas**

Johnson, W.C., Halfen, A.F., Andrzejewski, K.D.

325-13

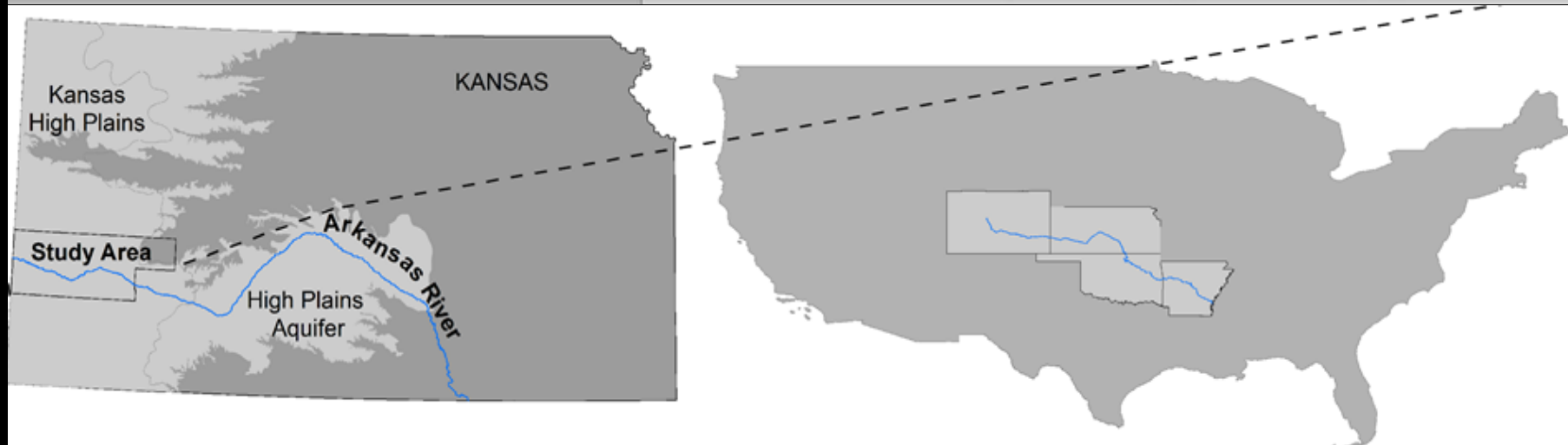
Geomorphology: Channels and Channel Change at Short to Long Time Scales  
Wednesday, 4 November 2015: 1:30 PM-5:30 PM

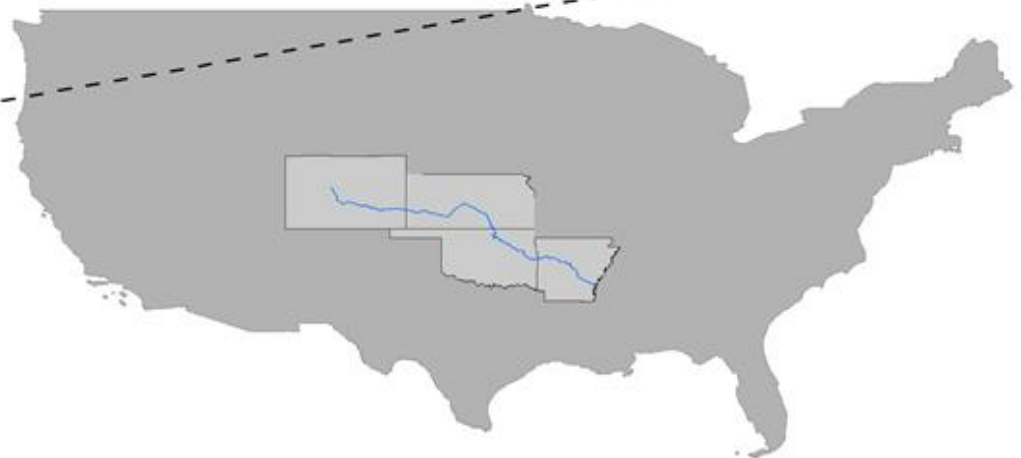
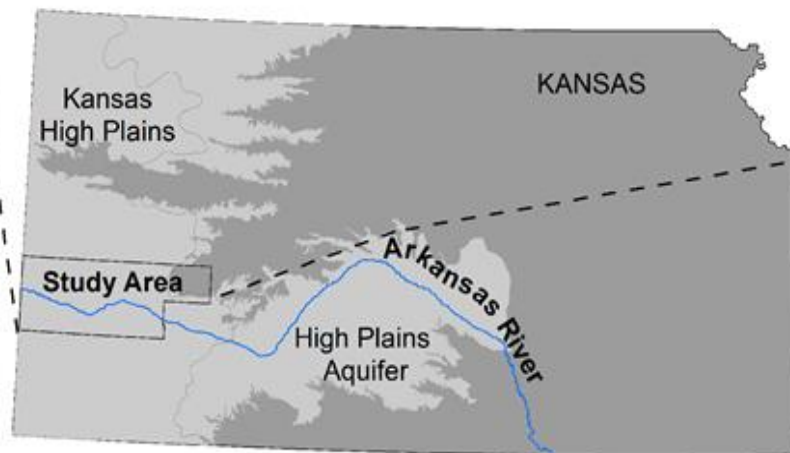
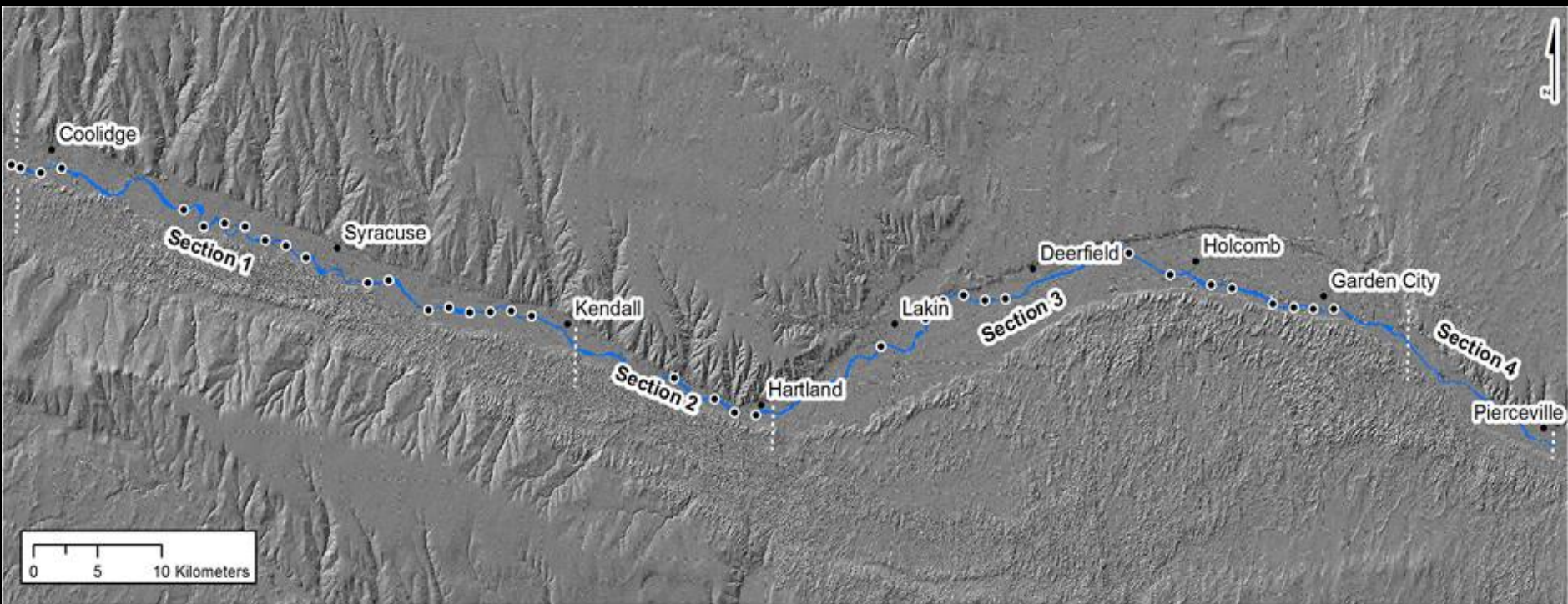
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Wednesday, 4 November 2015: 1:30 PM-5:30 PM







Down the Arkansas from Bridge at Garden City K's.  
- Wolf-Pho - High Wo

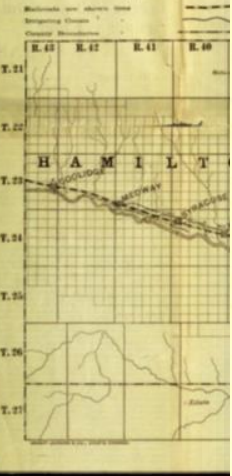








# WESTERN KANSAS SHOWING THE Farming and Grazing **LANDS** IN THE ARKANSAS VALLEY WITHIN THE LIMITS OF THE A. T. & S. F. R. R. Grant.

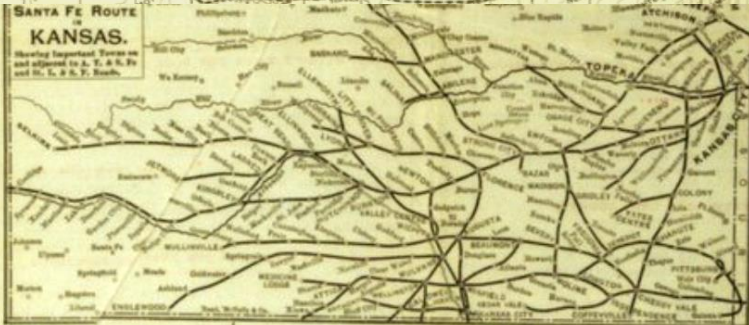


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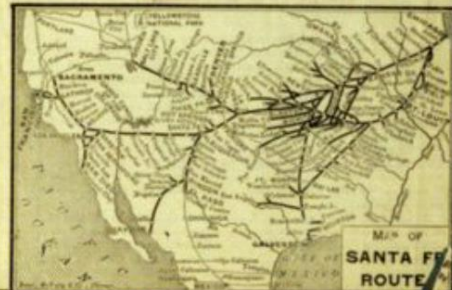
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### WHY NOT GET A HOME IN THE **? GREAT SOUTHWEST**

For information about  
 Kansas, Oklahoma,  
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**SANTA FE ROUTE**  
 REACHES  
 NEARLY ALL  
 SECTIONS  
**KANSAS**  
 The Riches  
 And Most  
 Productive  
 Lands in the  
 State Lie  
 The Main  
 And Branch  
 Of the  
 A. T. & S. F. R. R.

**THE MONTEZUMA HOTEL**

**Santa Fe Route**

**KANSAS**  
 FOR PASSENGER SERVICE  
 TO  
**TEXAS**

**JNO. E. FROST**  
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**RESULTS OF ADVERTISING**

**RESULTS OF ADVERTISING**

**RESULTS OF ADVERTISING**

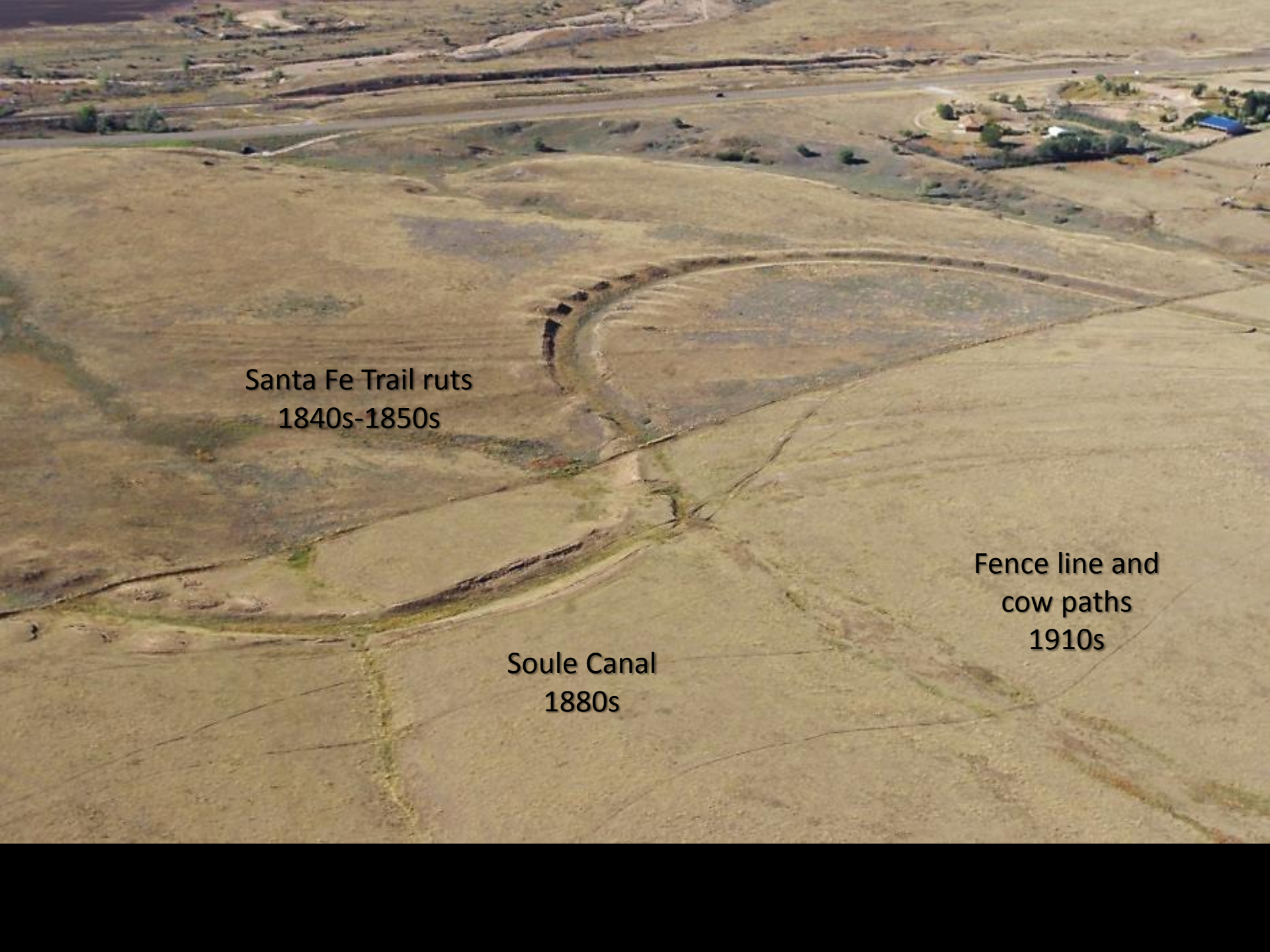
**RESULTS OF ADVERTISING**

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**SANTA FE ROUTE**



An aerial photograph of a dry, hilly landscape. The terrain is mostly brown and tan, with some patches of green vegetation. A winding road or path is visible in the upper left. In the upper right, there is a small cluster of buildings, including a house and a blue-roofed structure. The landscape is marked by several distinct features: a series of dark, curved ruts in the center-left; a straight line crossing the middle; and a series of faint, parallel lines in the lower right.

Santa Fe Trail ruts  
1840s-1850s

Soule Canal  
1880s

Fence line and  
cow paths  
1910s

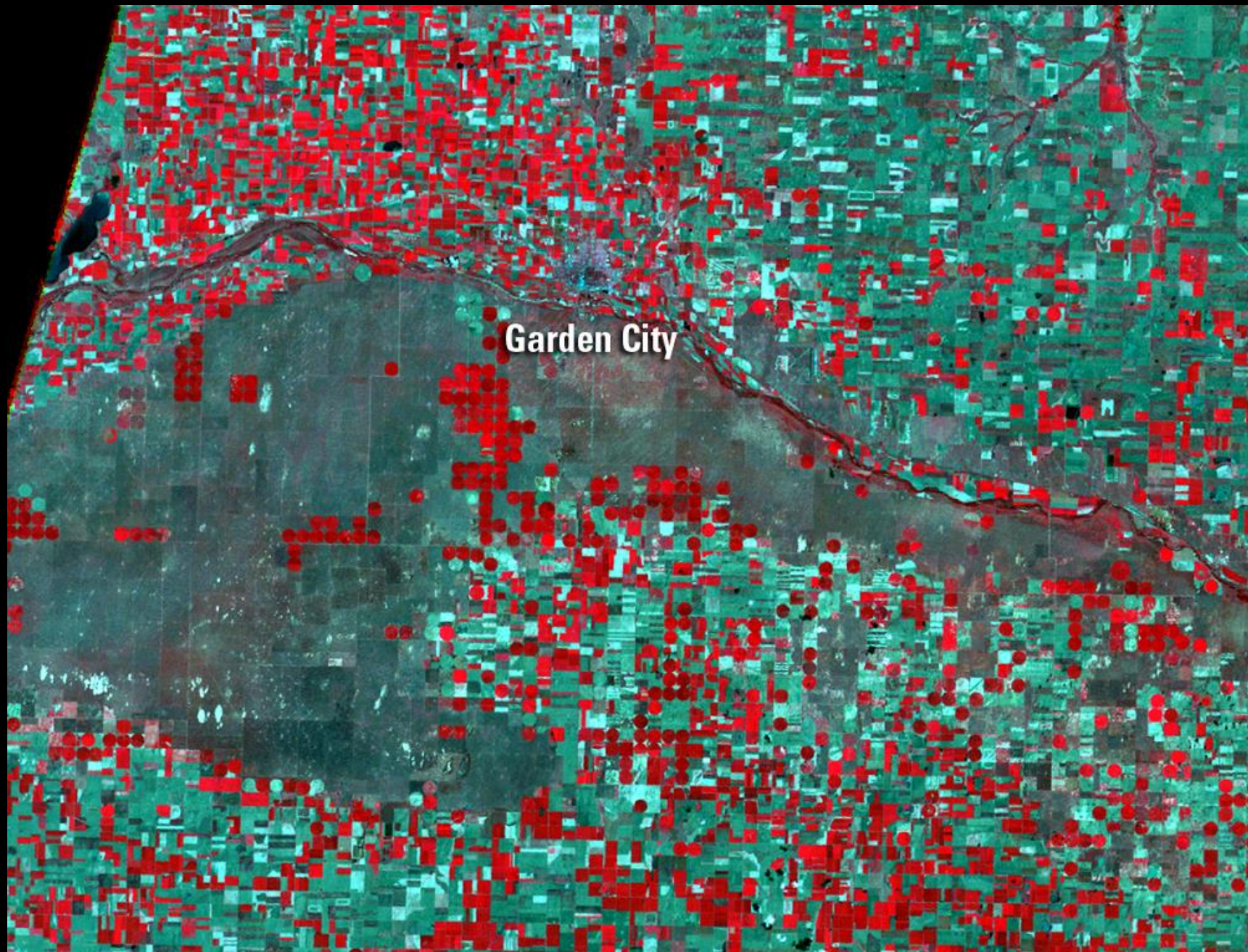




## John Martin dam and reservoir, eastern Colorado (1948)







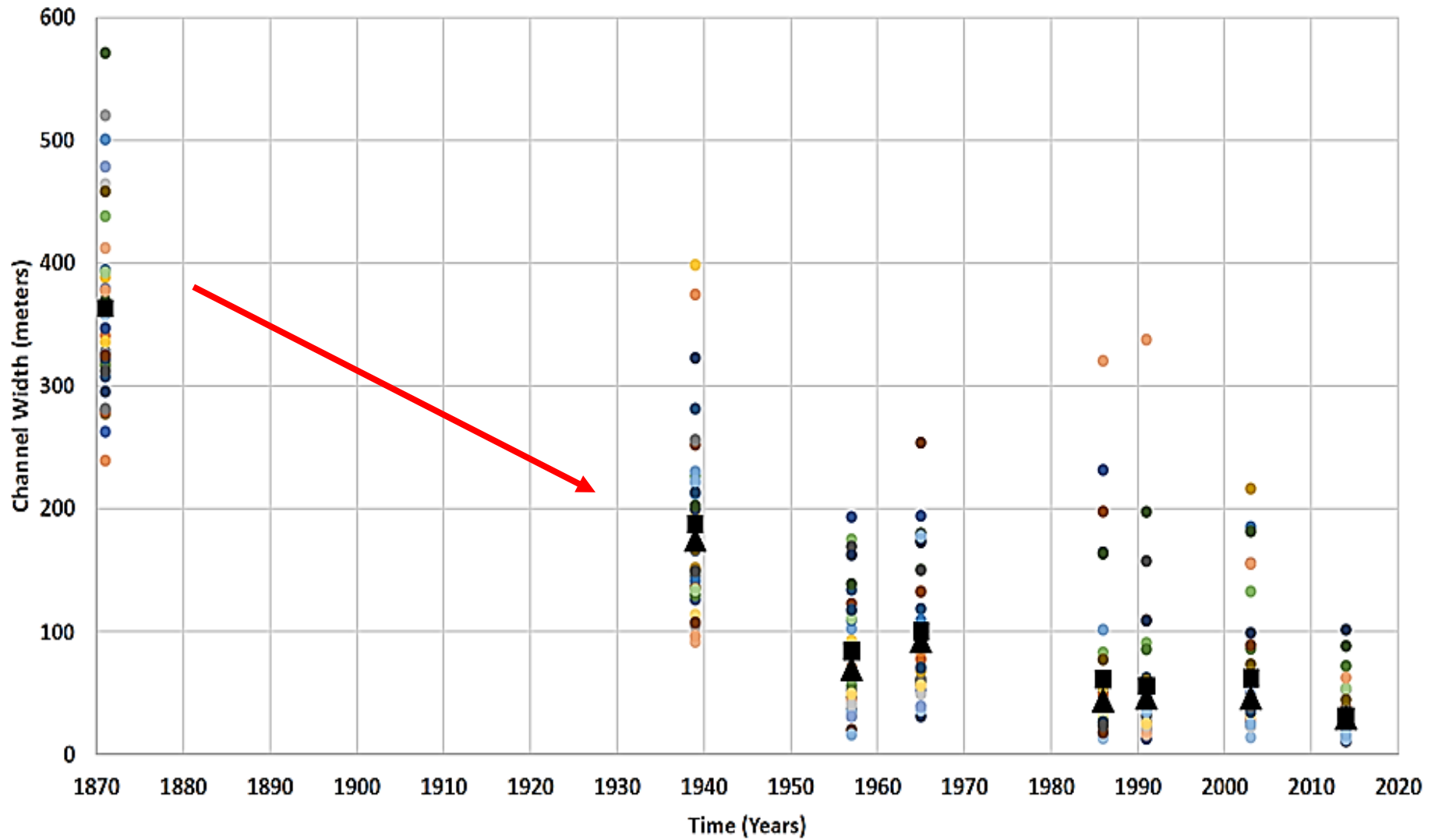


25-30 m ↓





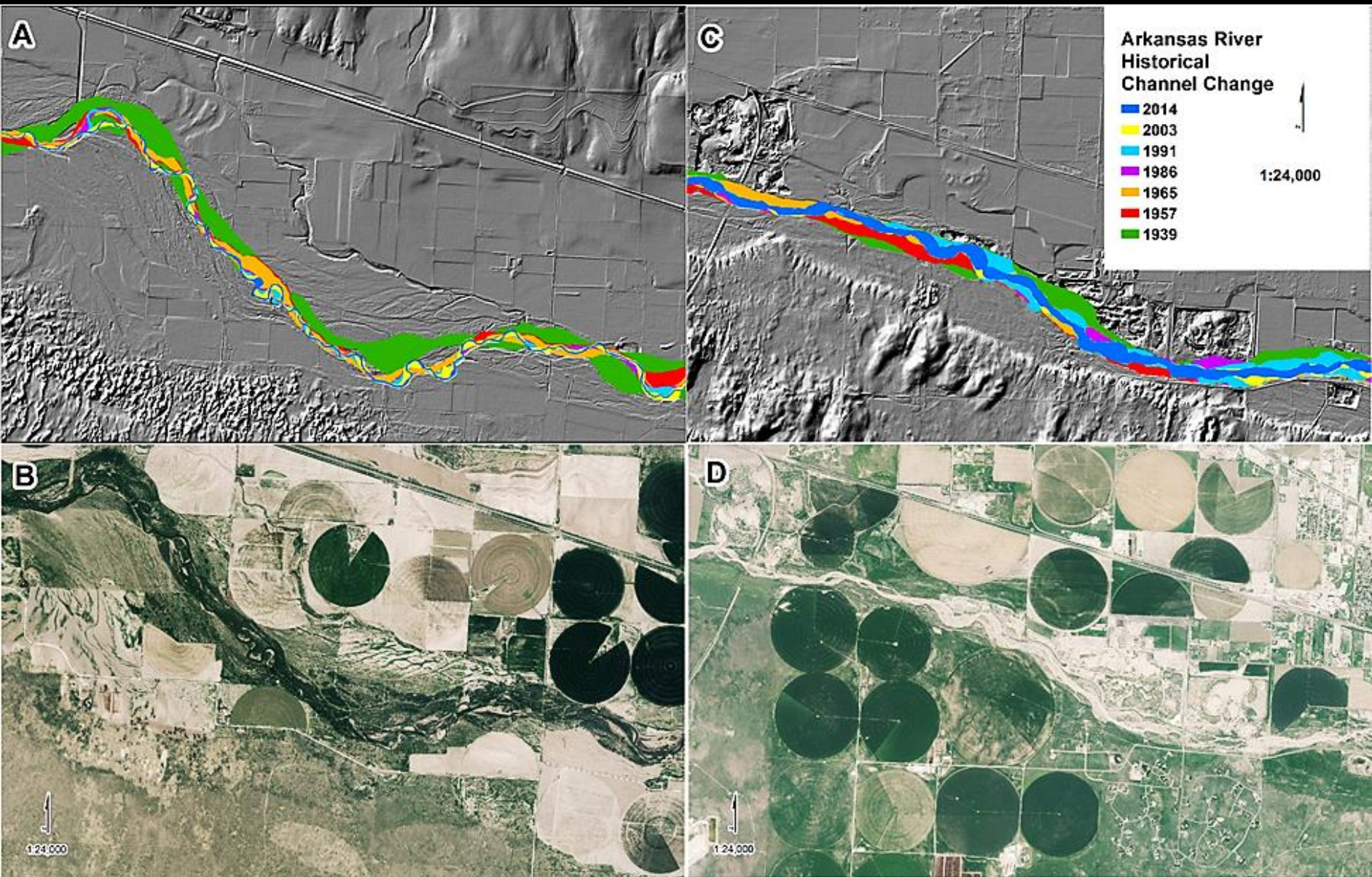
# Width Changes using Original Federal Land Survey (1871) and Aerial Photography

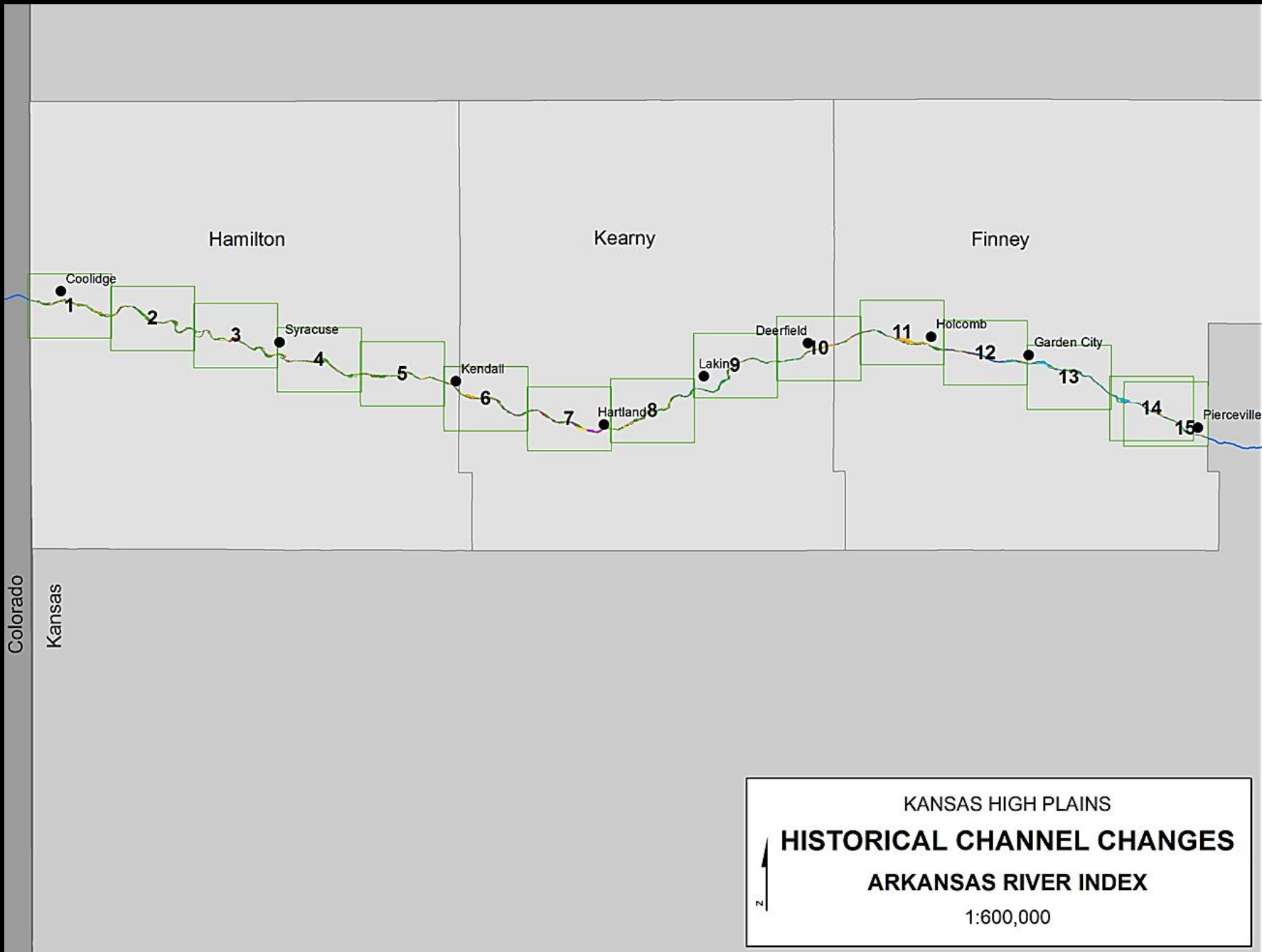


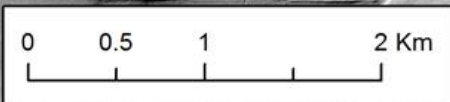




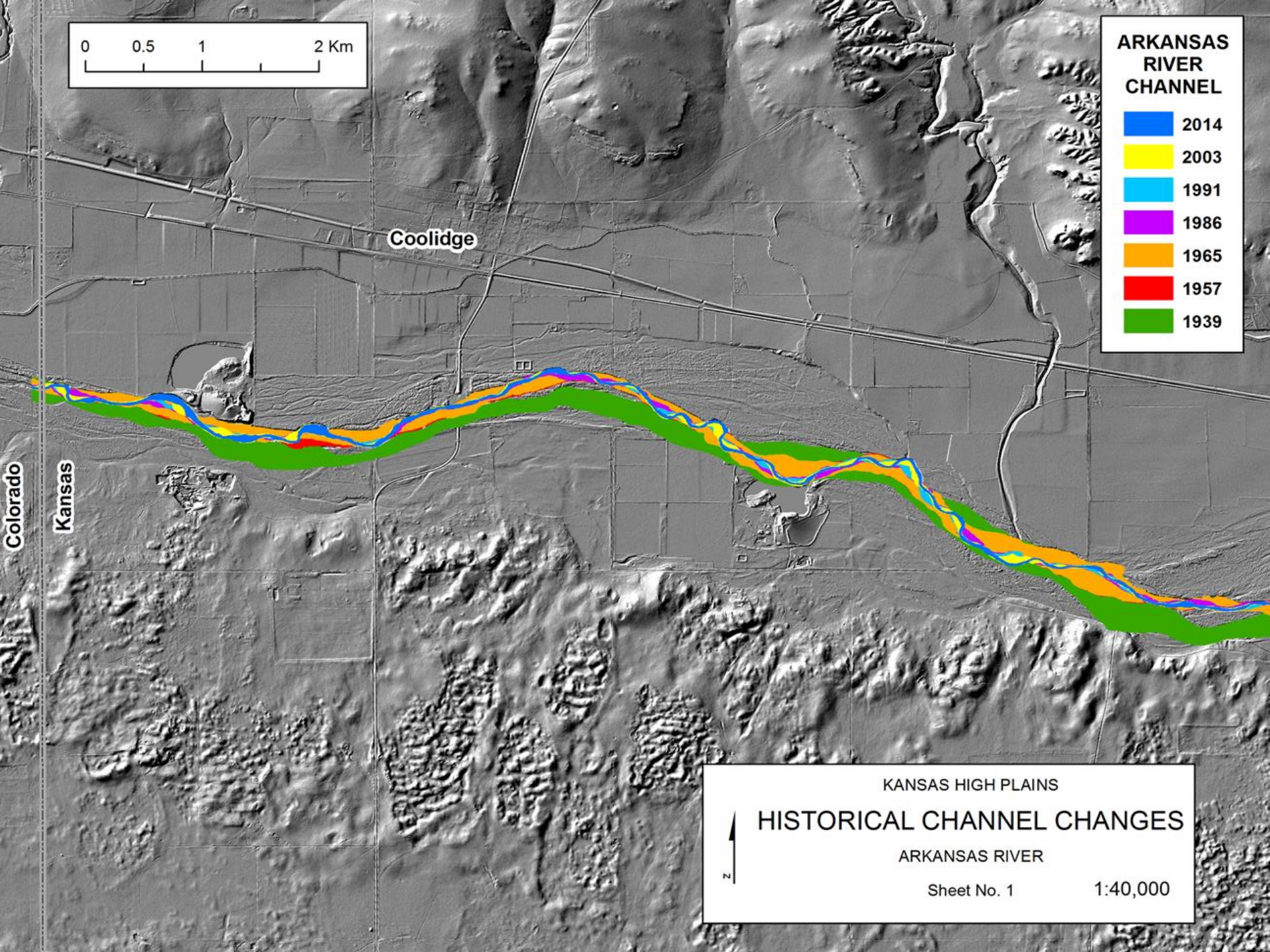


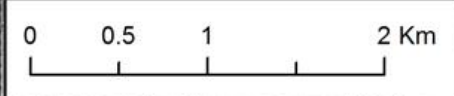




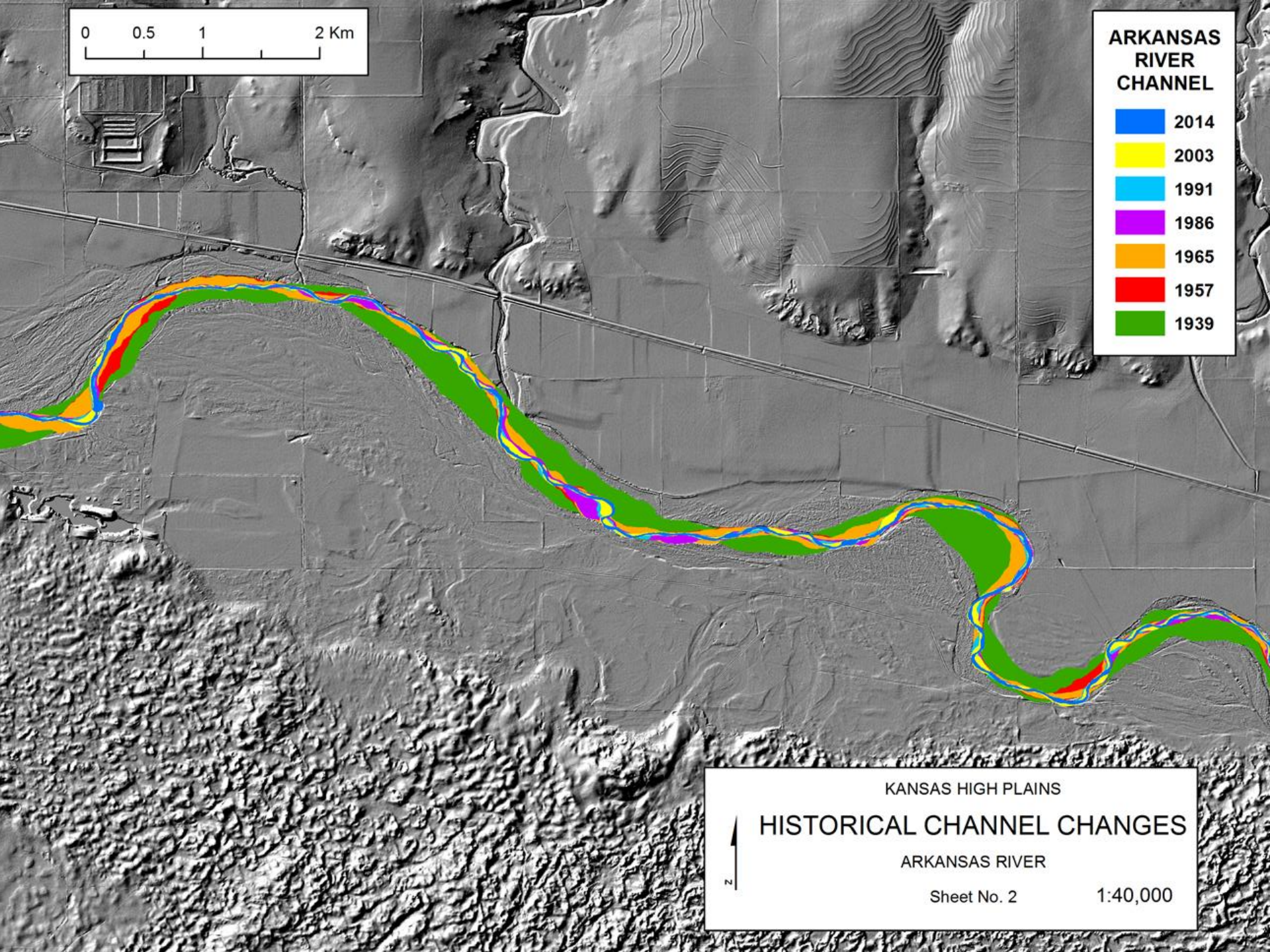


**ARKANSAS  
RIVER  
CHANNEL**





# ARKANSAS RIVER CHANNEL



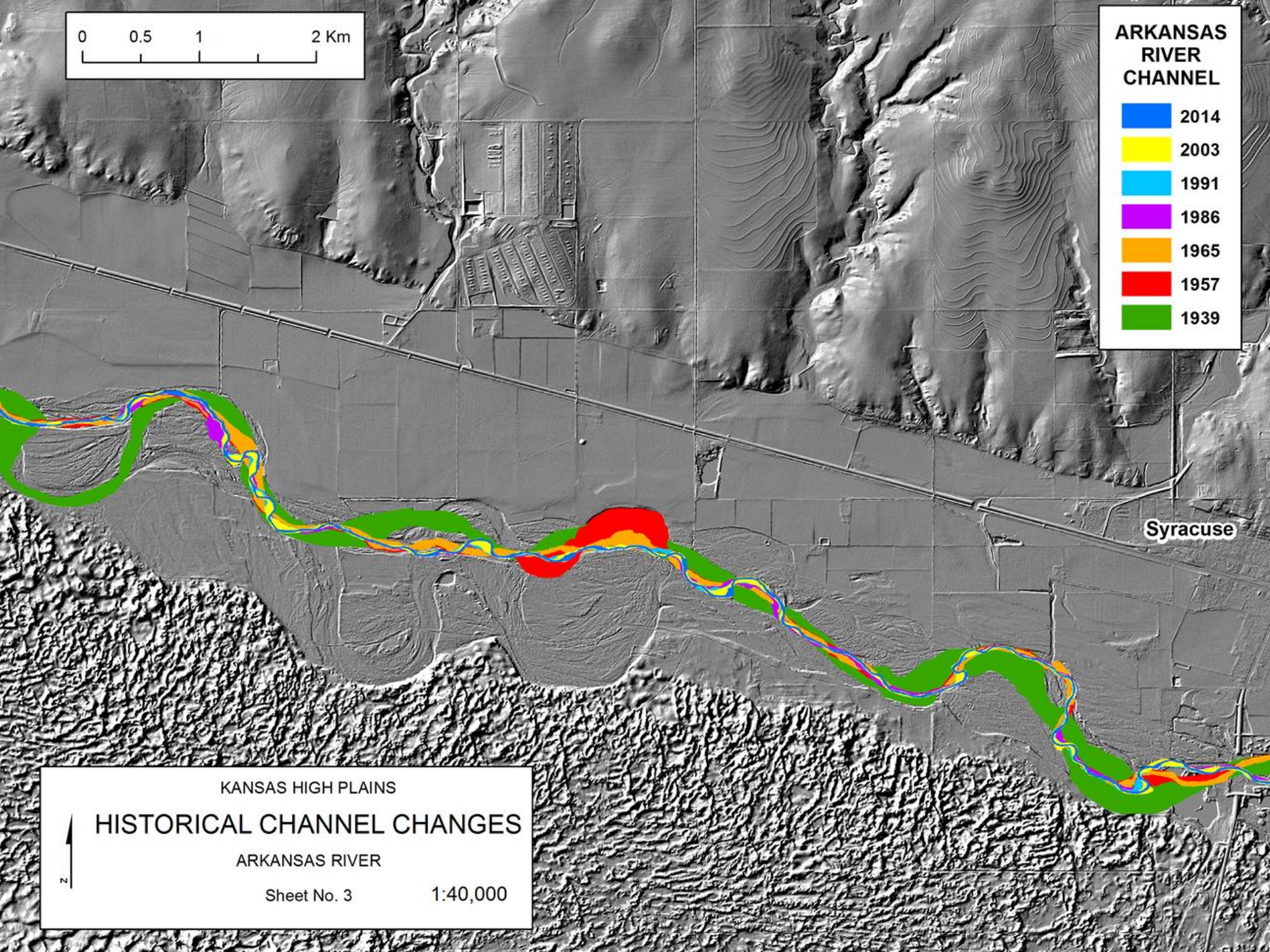
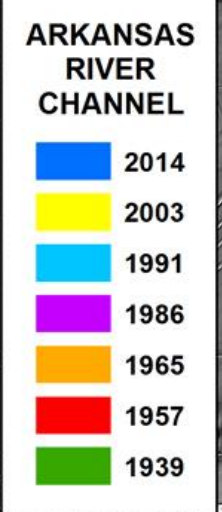
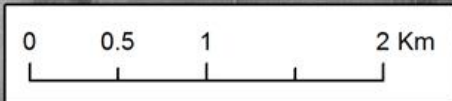
KANSAS HIGH PLAINS

**HISTORICAL CHANNEL CHANGES**

ARKANSAS RIVER

Sheet No. 2

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Syracuse

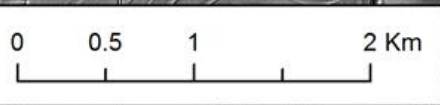
KANSAS HIGH PLAINS

**HISTORICAL CHANNEL CHANGES**

ARKANSAS RIVER

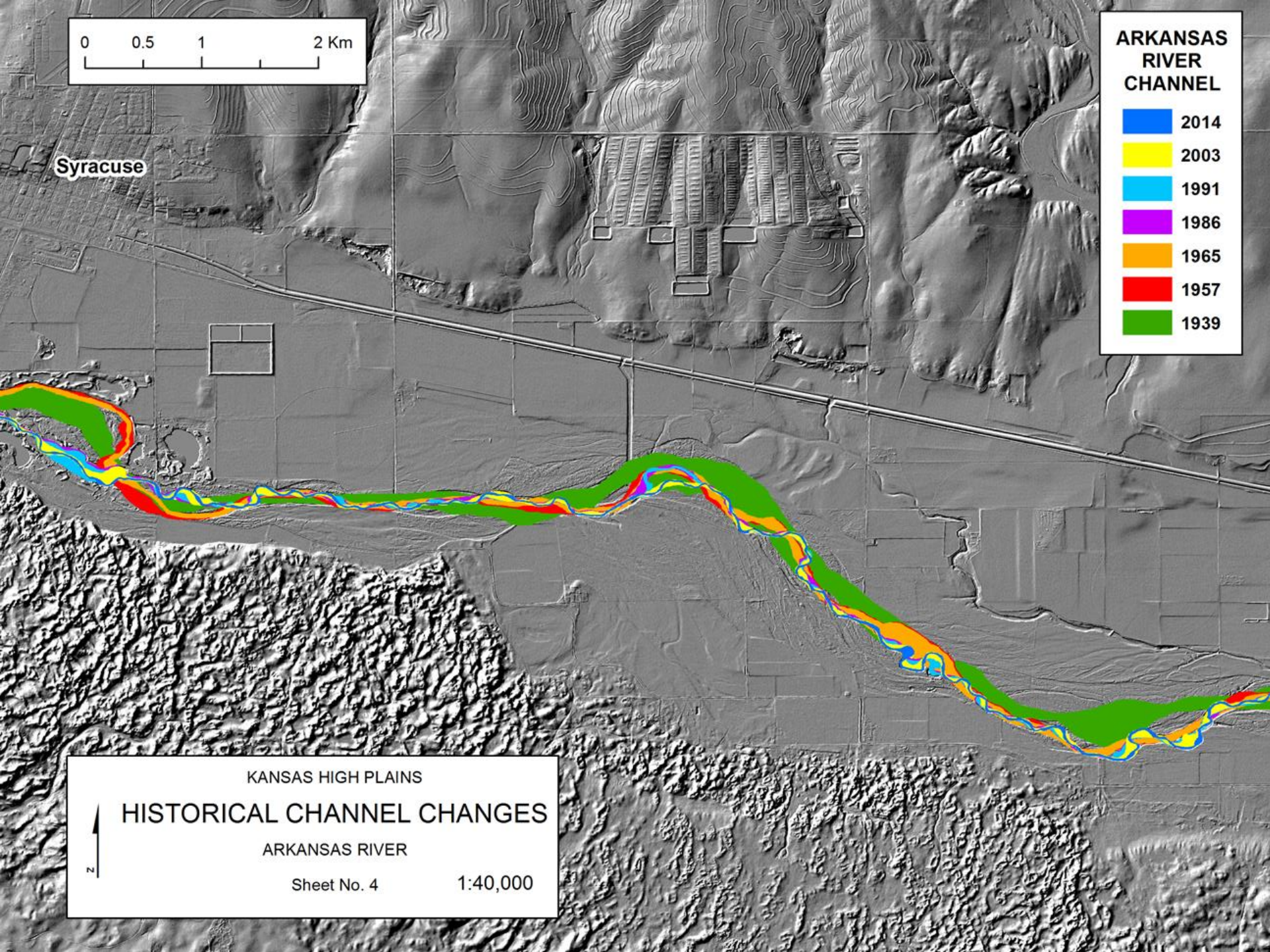
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↑



Syracuse

# ARKANSAS RIVER CHANNEL



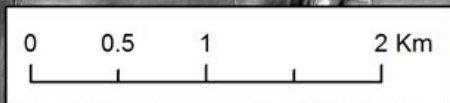
KANSAS HIGH PLAINS

## HISTORICAL CHANNEL CHANGES

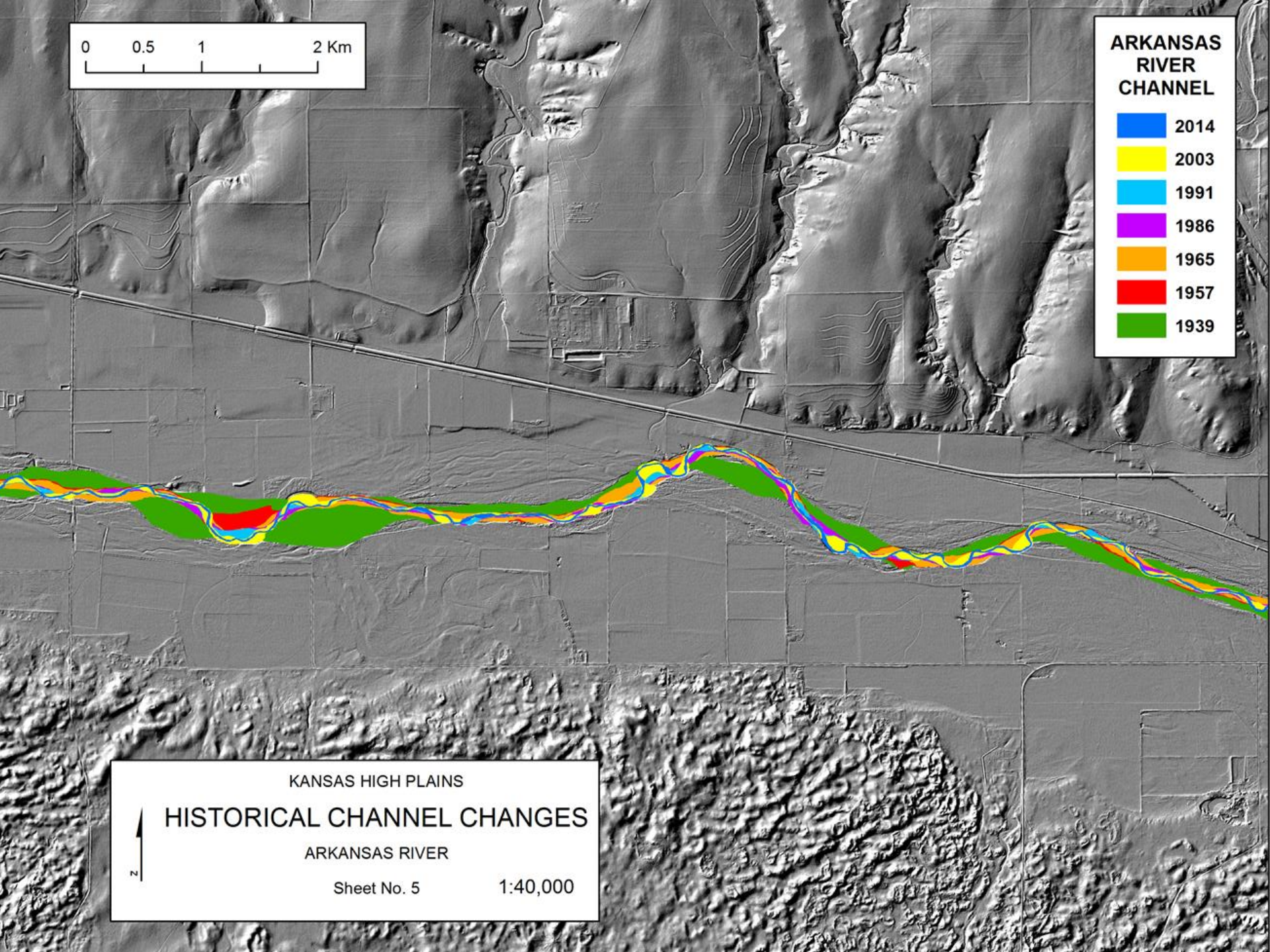
ARKANSAS RIVER

Sheet No. 4

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# ARKANSAS RIVER CHANNEL



KANSAS HIGH PLAINS

## HISTORICAL CHANNEL CHANGES

ARKANSAS RIVER

Sheet No. 5

1:40,000

0 0.5 1 2 Km

# ARKANSAS RIVER CHANNEL

- 2014
- 2003
- 1991
- 1986
- 1965
- 1957
- 1939

Kendall

KANSAS HIGH PLAINS

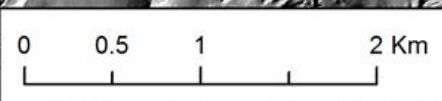
## HISTORICAL CHANNEL CHANGES

ARKANSAS RIVER

Sheet No. 6

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**ARKANSAS  
RIVER  
CHANNEL**



Hartland

KANSAS HIGH PLAINS  
**HISTORICAL CHANNEL CHANGES**  
ARKANSAS RIVER

Sheet No. 7

1:40,000

0 0.5 1 2 Km

**ARKANSAS  
RIVER  
CHANNEL**

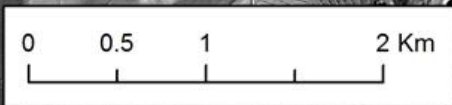
- 2014
- 2003
- 1991
- 1986
- 1965
- 1957
- 1939

Lakin

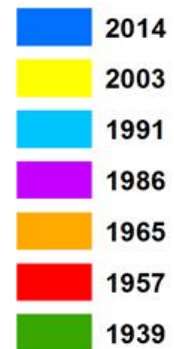
KANSAS HIGH PLAINS  
**HISTORICAL CHANNEL CHANGES**  
ARKANSAS RIVER

Sheet No. 8

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# ARKANSAS RIVER CHANNEL



Lakin



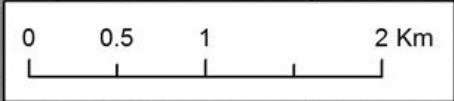
## HISTORICAL CHANNEL CHANGES

KANSAS HIGH PLAINS

ARKANSAS RIVER

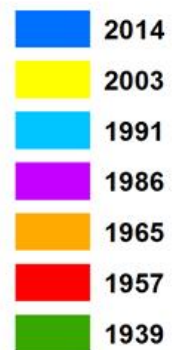
Sheet No. 9

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Deerfield

ARKANSAS  
RIVER  
CHANNEL



KANSAS HIGH PLAINS

HISTORICAL CHANNEL CHANGES

ARKANSAS RIVER

Sheet No. 10

1:40,000



0 0.5 1 2 Km

**ARKANSAS  
RIVER  
CHANNEL**

- 2014
- 2003
- 1991
- 1986
- 1965
- 1957
- 1939

Holcomb

KANSAS HIGH PLAINS

**HISTORICAL CHANNEL CHANGES**

ARKANSAS RIVER

Sheet No. 11

1:40,000

0 0.5 1 2 Km

# ARKANSAS RIVER CHANNEL

2014  
2003  
1991  
1986  
1965  
1957  
1939

Garden  
City

KANSAS HIGH PLAINS

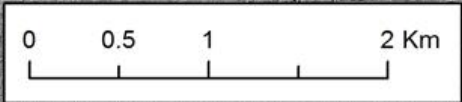
## HISTORICAL CHANNEL CHANGES

ARKANSAS RIVER

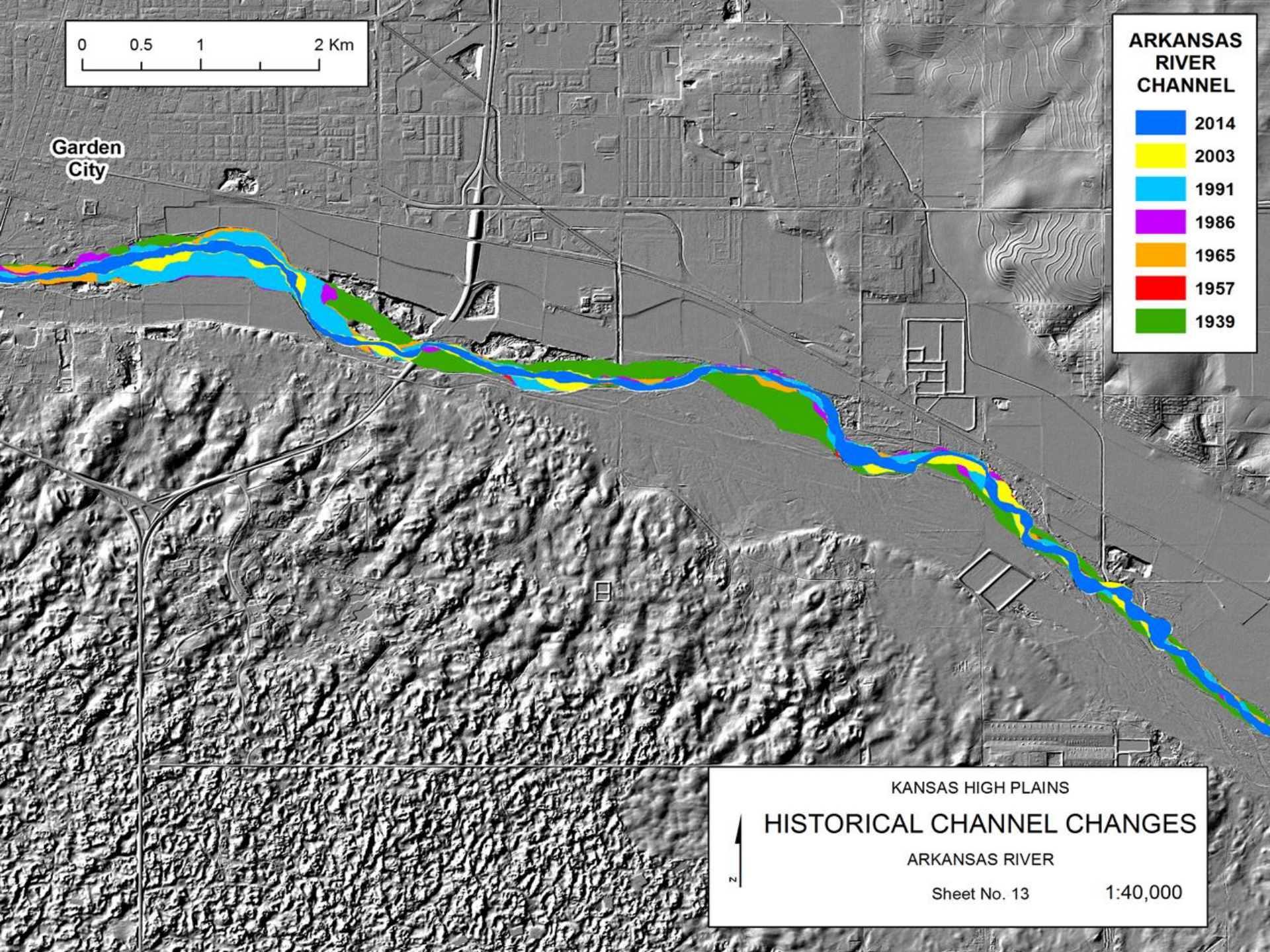
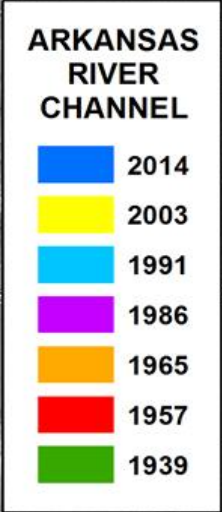
Sheet No. 12

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Garden  
City

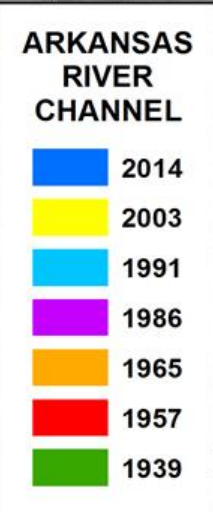
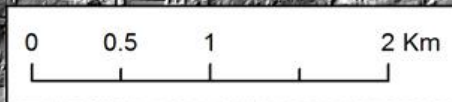


KANSAS HIGH PLAINS

**HISTORICAL CHANNEL CHANGES**

ARKANSAS RIVER

Sheet No. 13      1:40,000

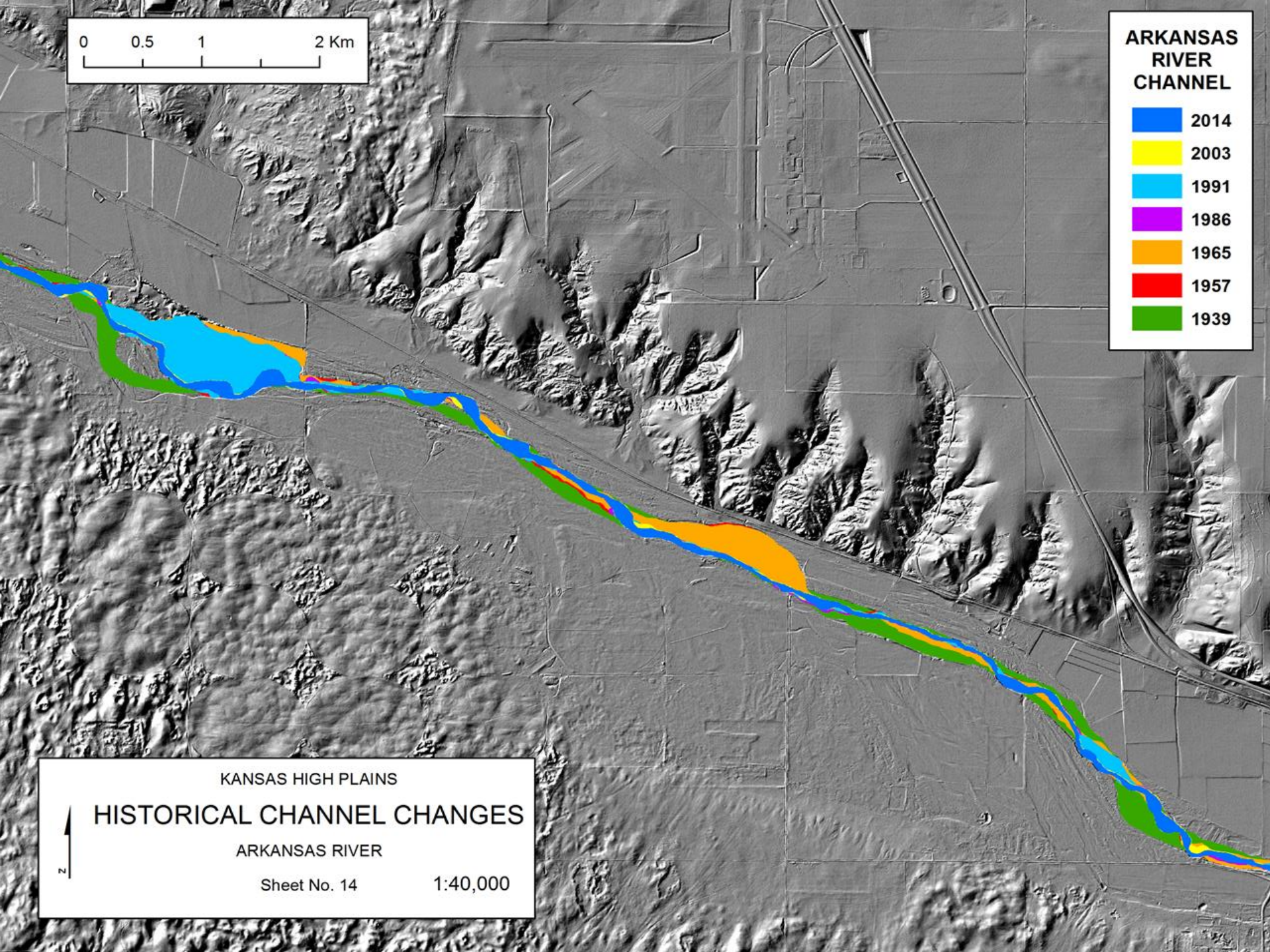


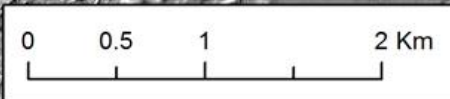
KANSAS HIGH PLAINS

**HISTORICAL CHANNEL CHANGES**

ARKANSAS RIVER

Sheet No. 14      1:40,000





# ARKANSAS RIVER CHANNEL



Pierceville

## KANSAS HIGH PLAINS HISTORICAL CHANNEL CHANGES ARKANSAS RIVER

Sheet No. 15

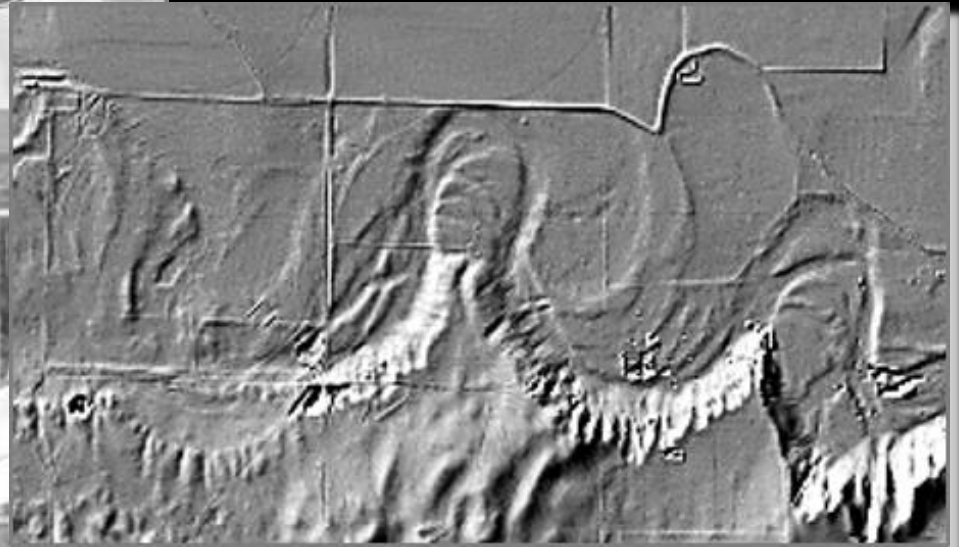
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Decrease in Width (~450 m to 20-30 m)  
Entrenchment (4-5 m)  
Increase in Sinuosity (~1.2 in 1939 to ~1.5 in 2014)  
Only a small Q near state line – to irrigation canals

A Different Perspective!

LGM Paleochannels

20-18 ka





A white pickup truck is driving away from the viewer on a wide, sandy path that winds through a landscape of low-lying green and brown shrubs. In the far distance, a line of wind turbines is visible against a clear sky. The text "Thank you!" is overlaid in the center of the image.

**Thank you!**

**USGS EDMAP Program  
The University of Kansas General Research Fund  
Kansas Geological Survey**