GENERAL BASIN MAP
BIG BLUE RIVER BASIN

Planning and Assistance Division

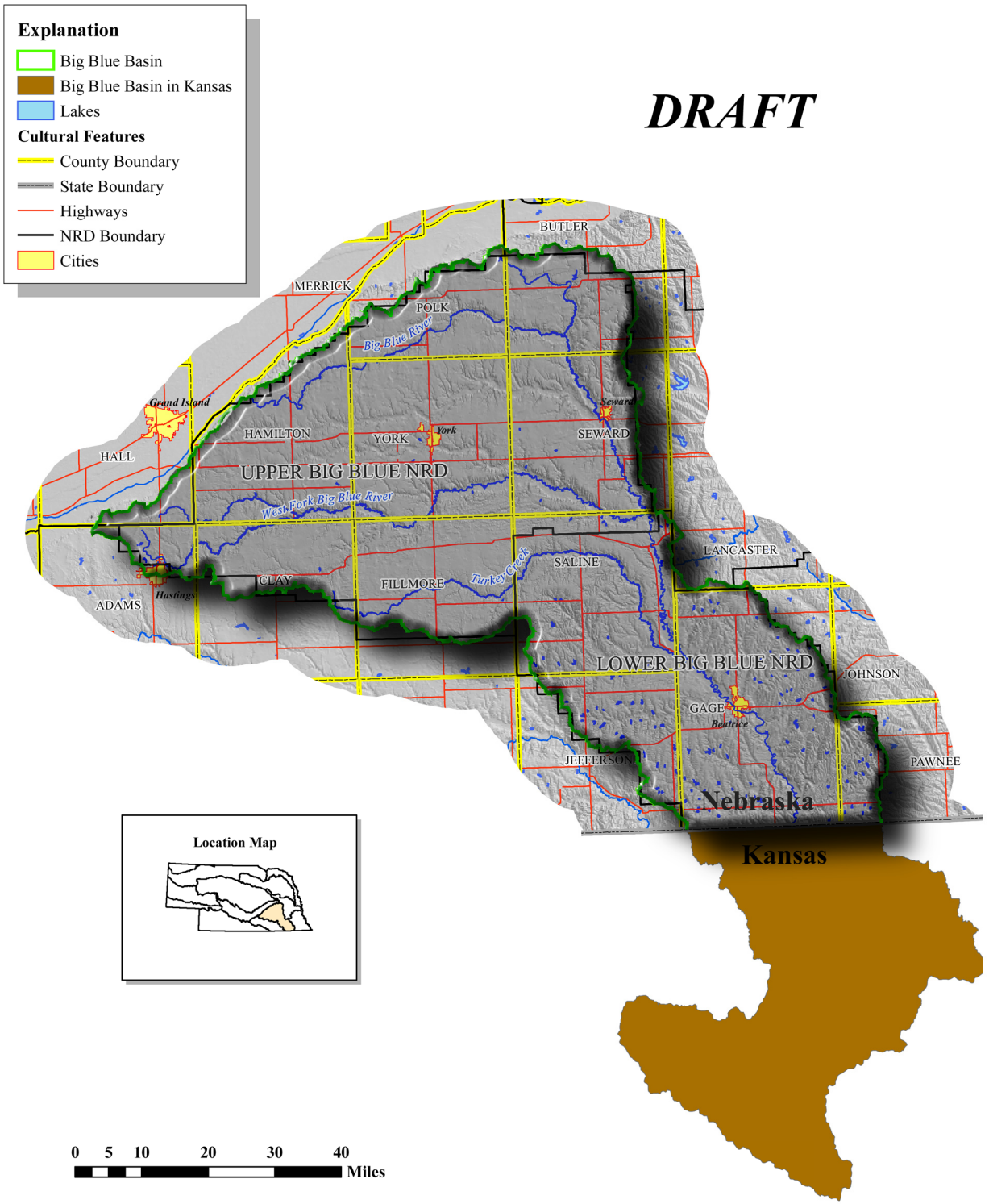

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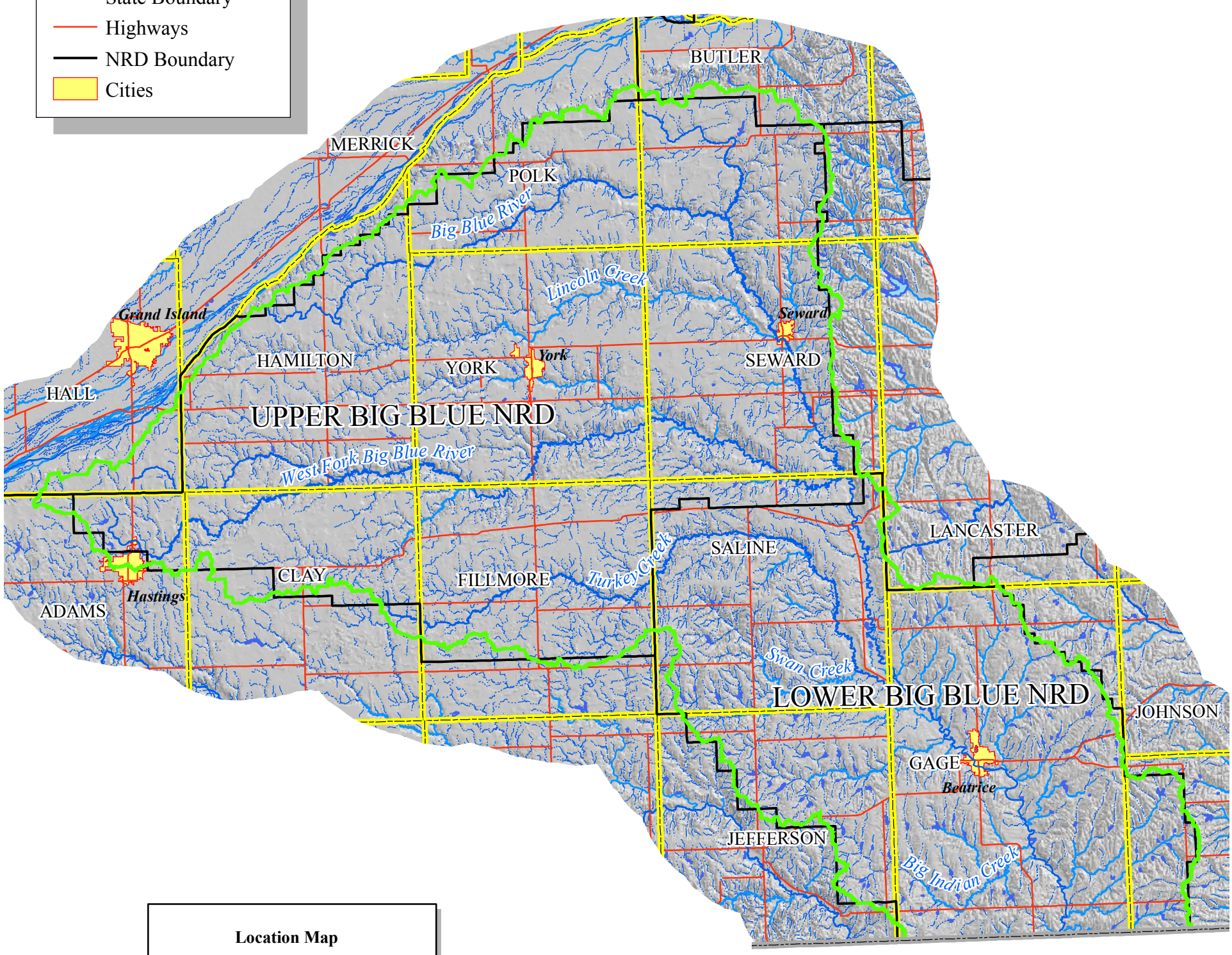
Figure BB-1.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General basin map produced by Shuhai Zheng, September 30, 2005.

General Surface Water Features
BIG BLUE RIVER BASIN

Planning and Assistance Division



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0 4 8 16 24 32 Miles

Figure BB-2.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General surface water features map produced by Shuhai Zheng, September 30, 2005.

Figure BB-3. Annual Precipitation at Aurora, Nebraska.

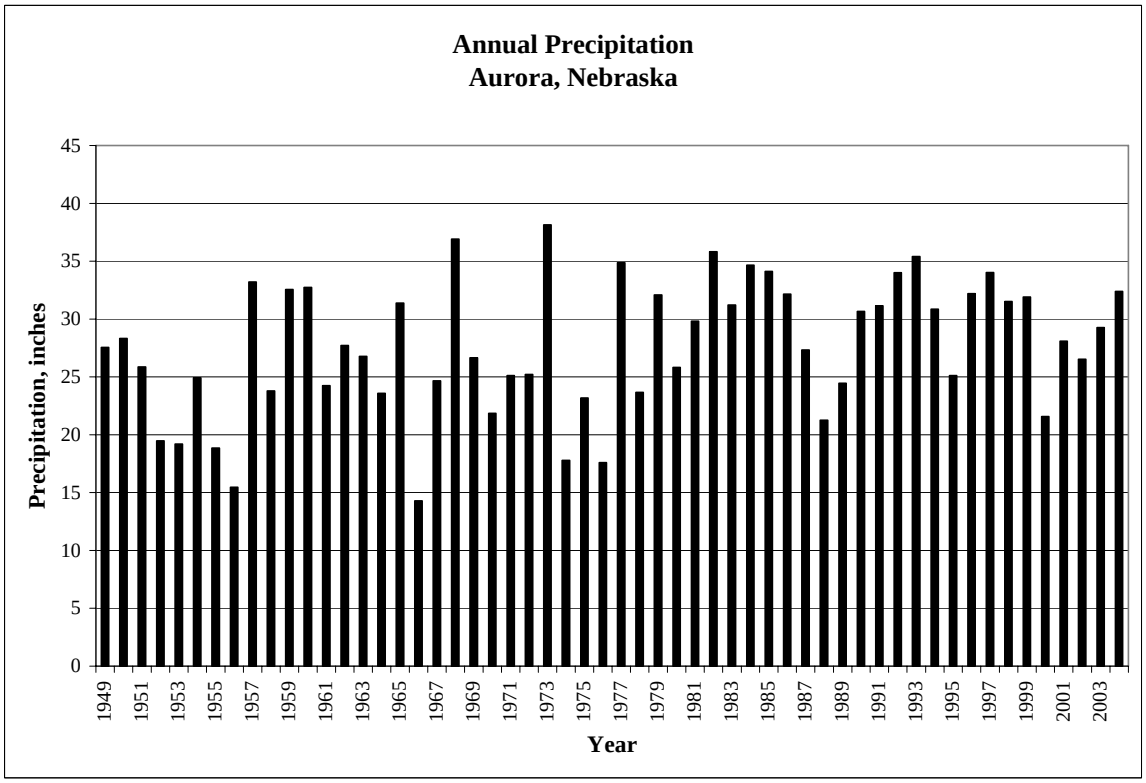


Figure BB-4. Growing Season (May-September) Precipitation at Aurora, Nebraska.

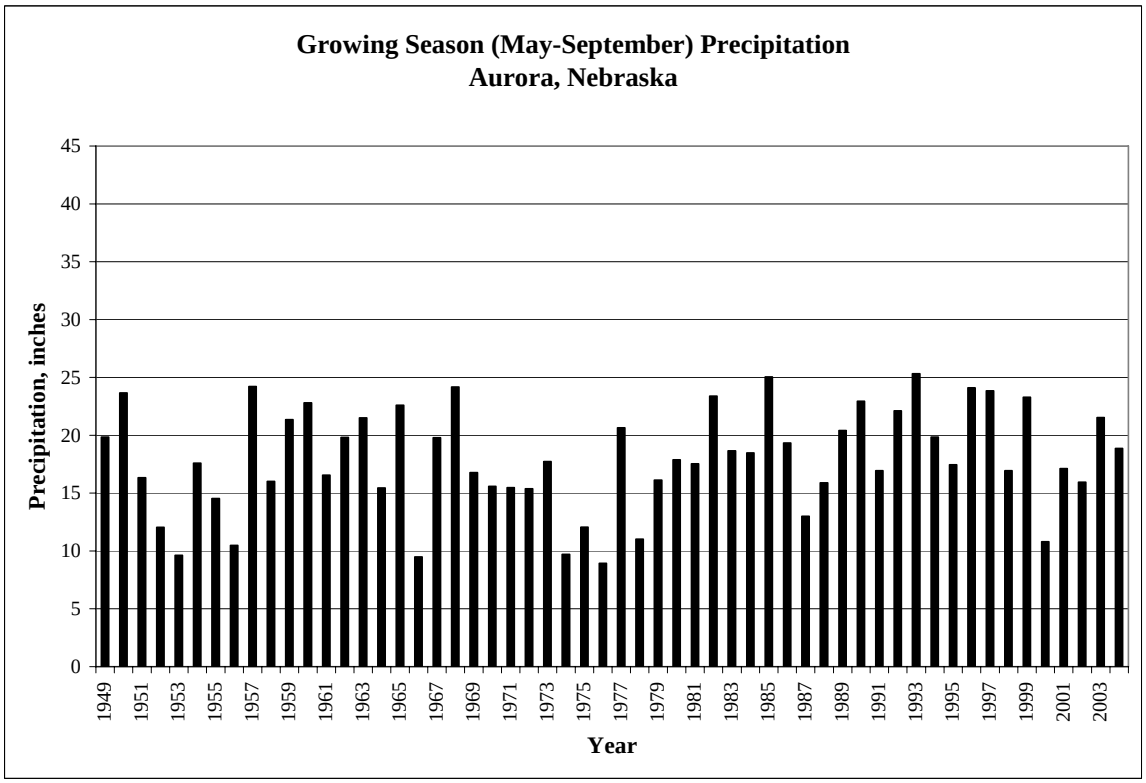


Figure BB-5. Annual Precipitation at Beatrice, Nebraska.

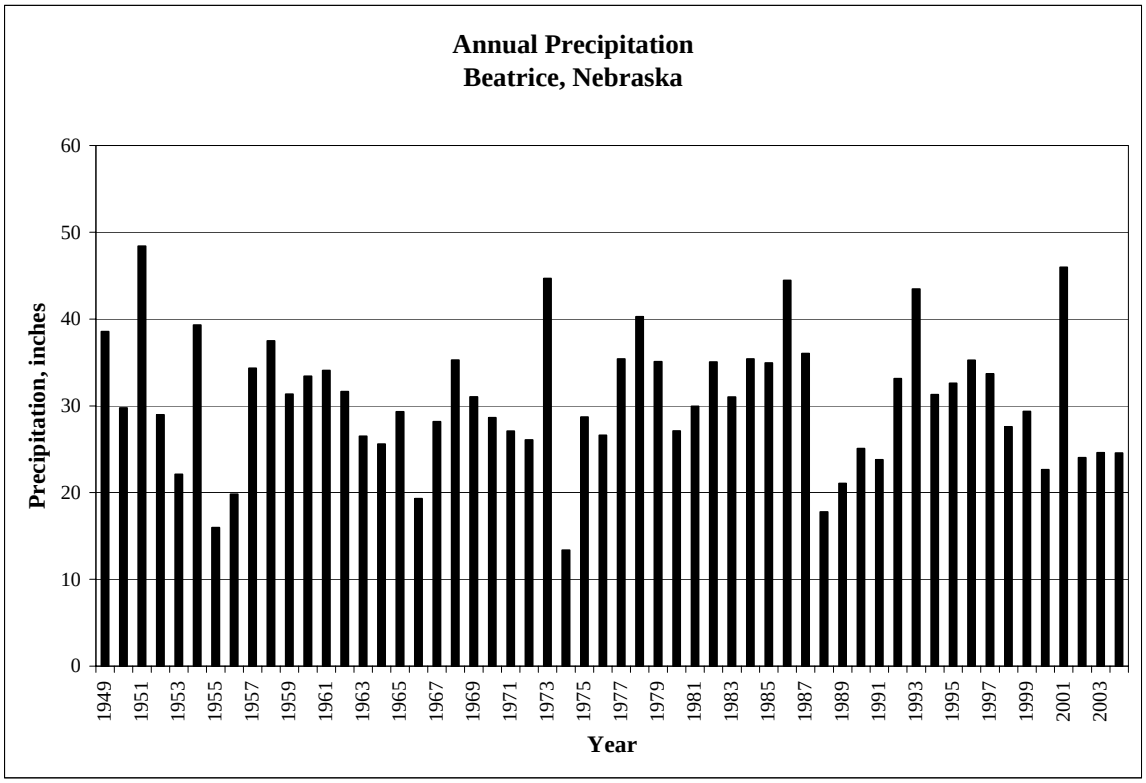


Figure BB-6. Growing Season (May-September) Precipitation at Beatrice, Nebraska.

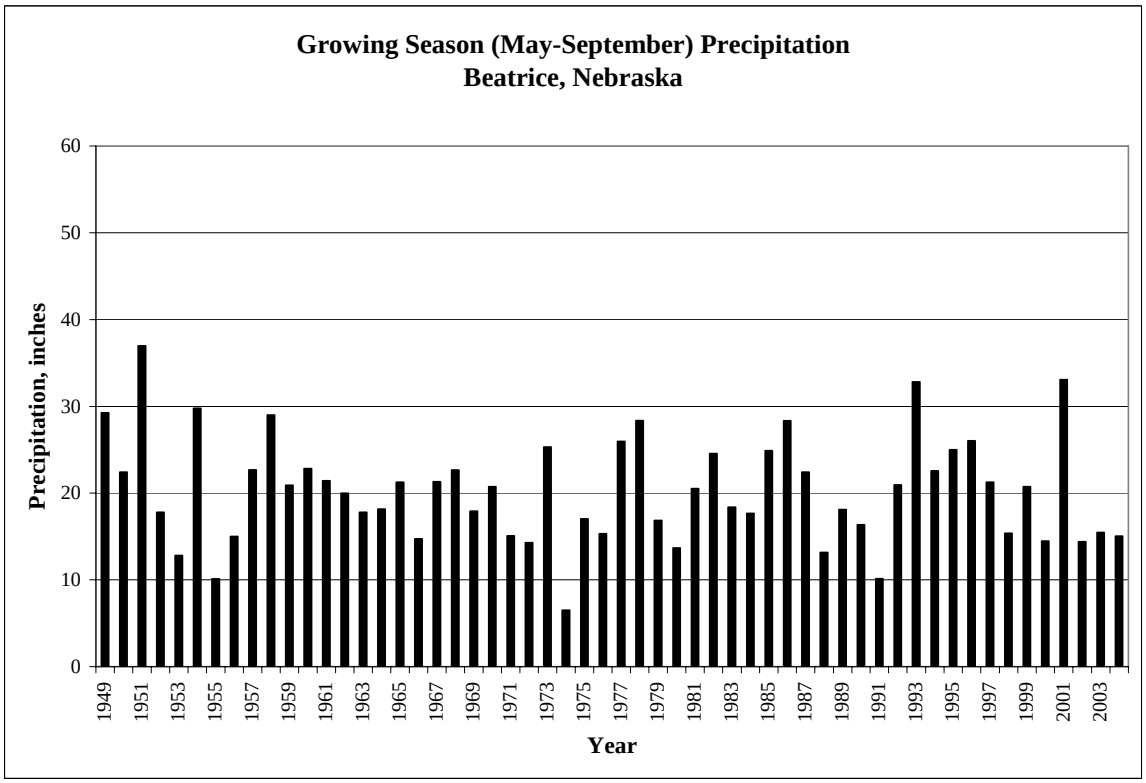


Figure BB-7. Annual Precipitation at Crete, Nebraska.

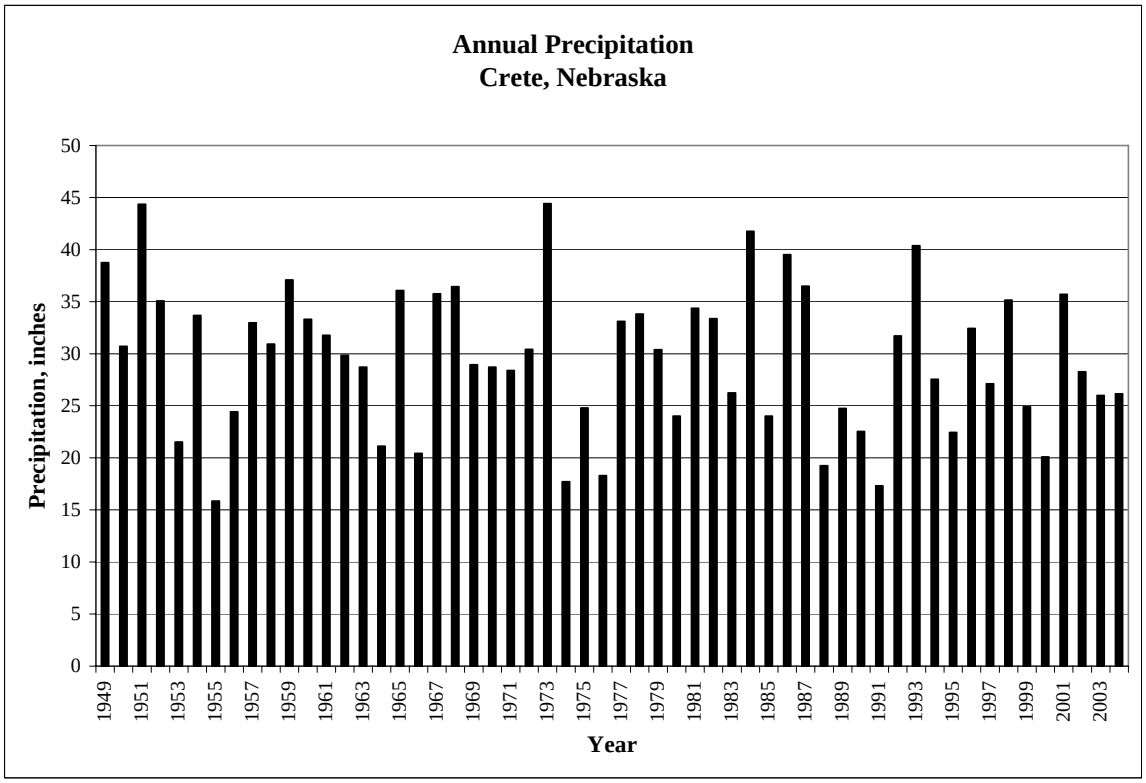


Figure BB-8. Growing Season (May-September) Precipitation at Crete, Nebraska.

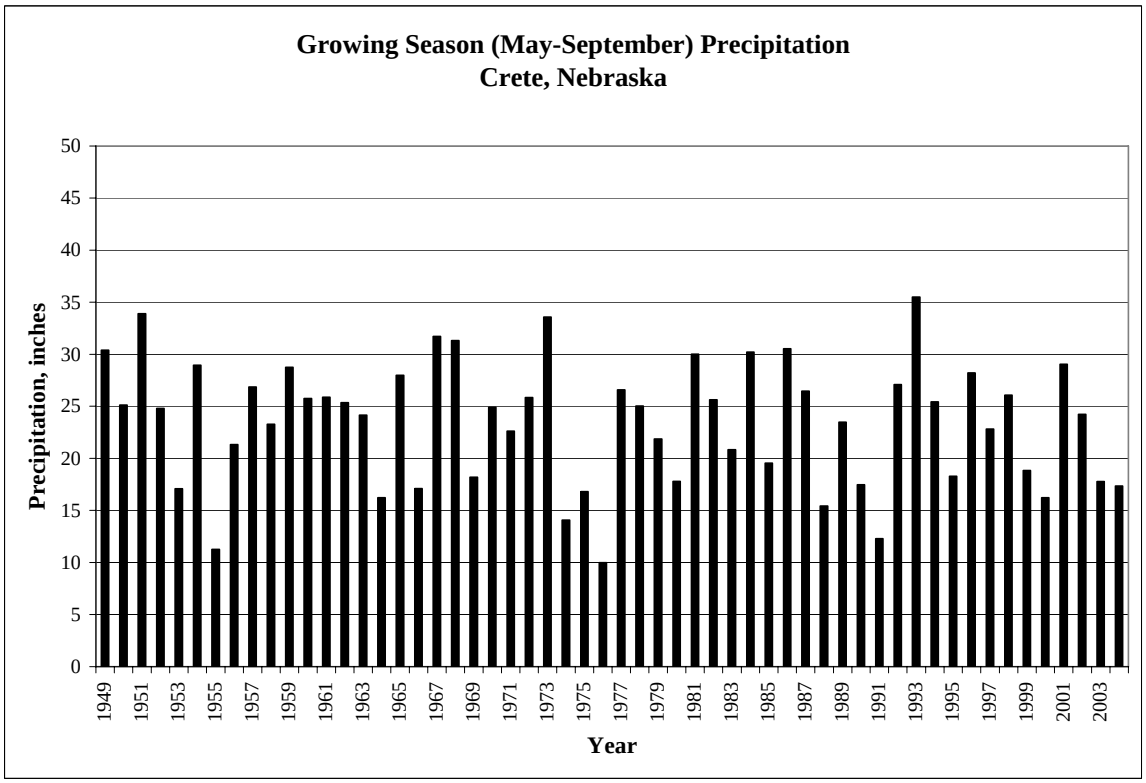


Figure BB-9. Annual Precipitation at Geneva, Nebraska.

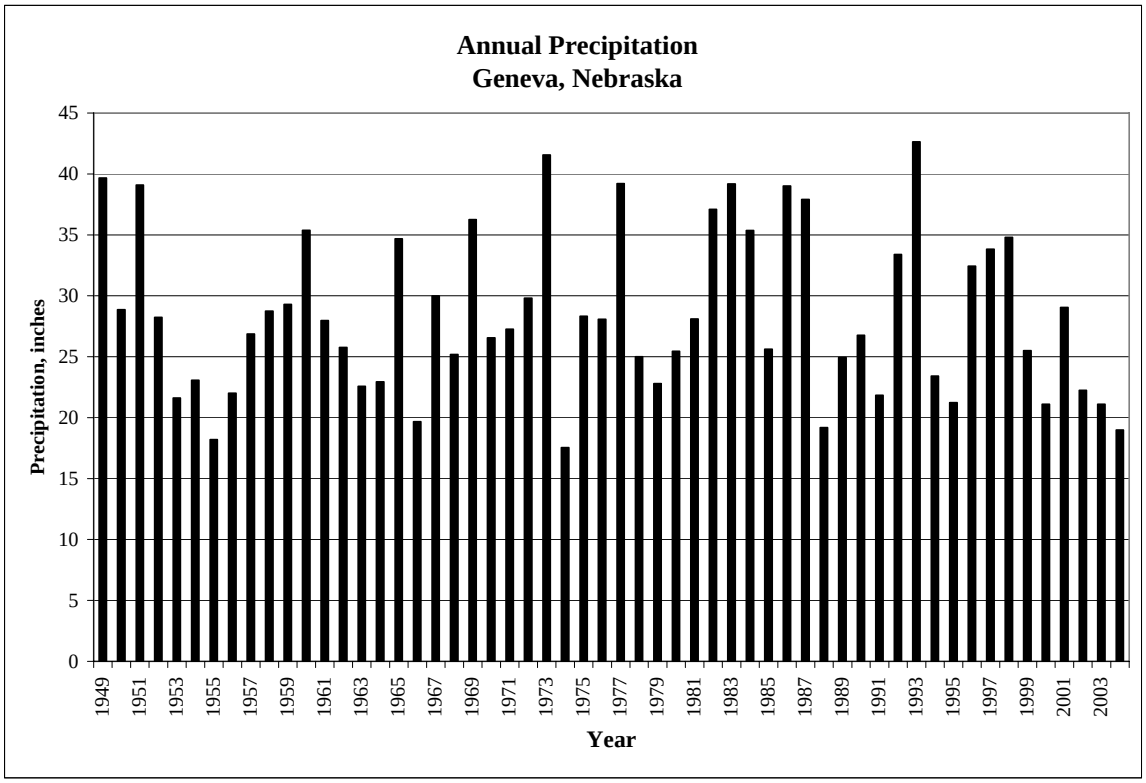


Figure BB-10. Growing Season (May-September) Precipitation at Geneva, Nebraska.

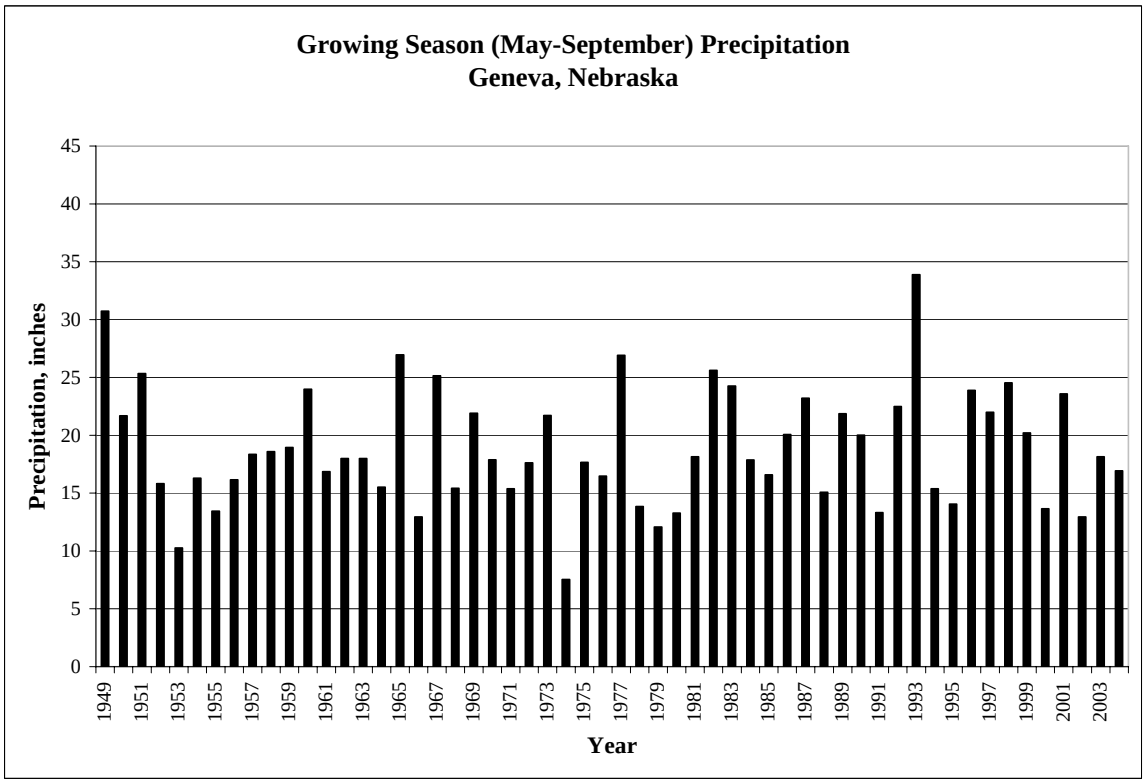


Figure BB-11. Annual Precipitation at Osceola, Nebraska.

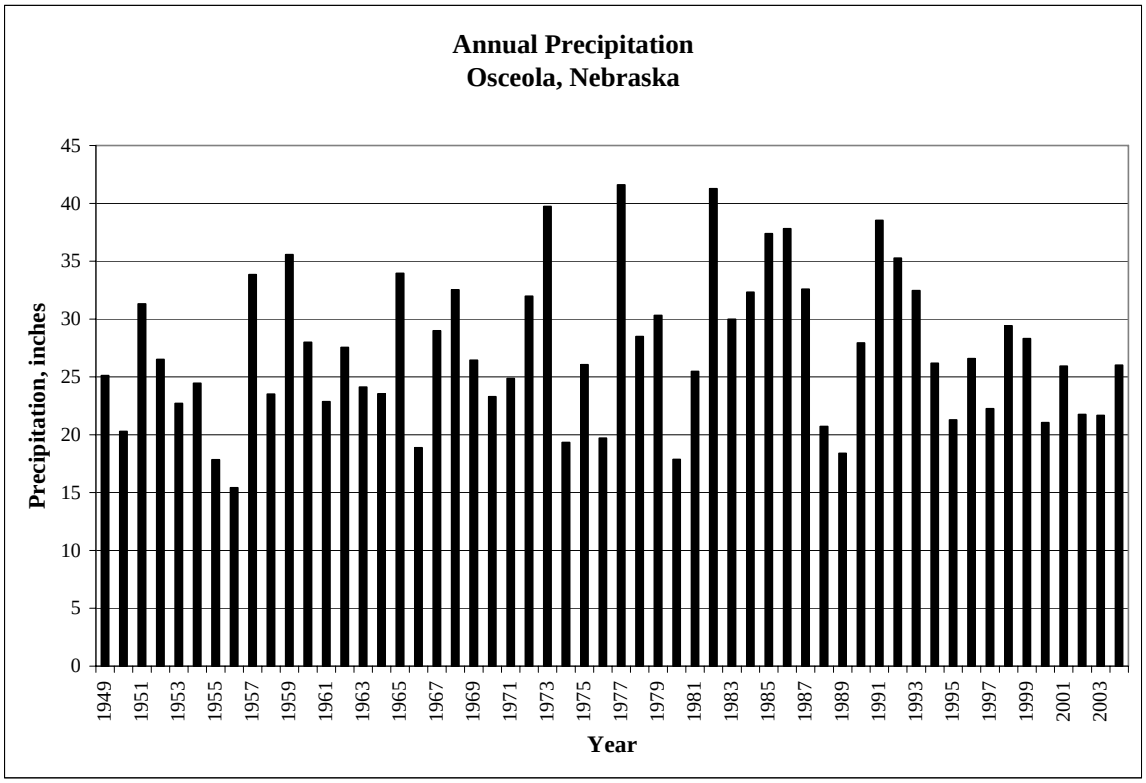


Figure BB-12. Growing Season (May-September) Precipitation at Osceola, Nebraska.

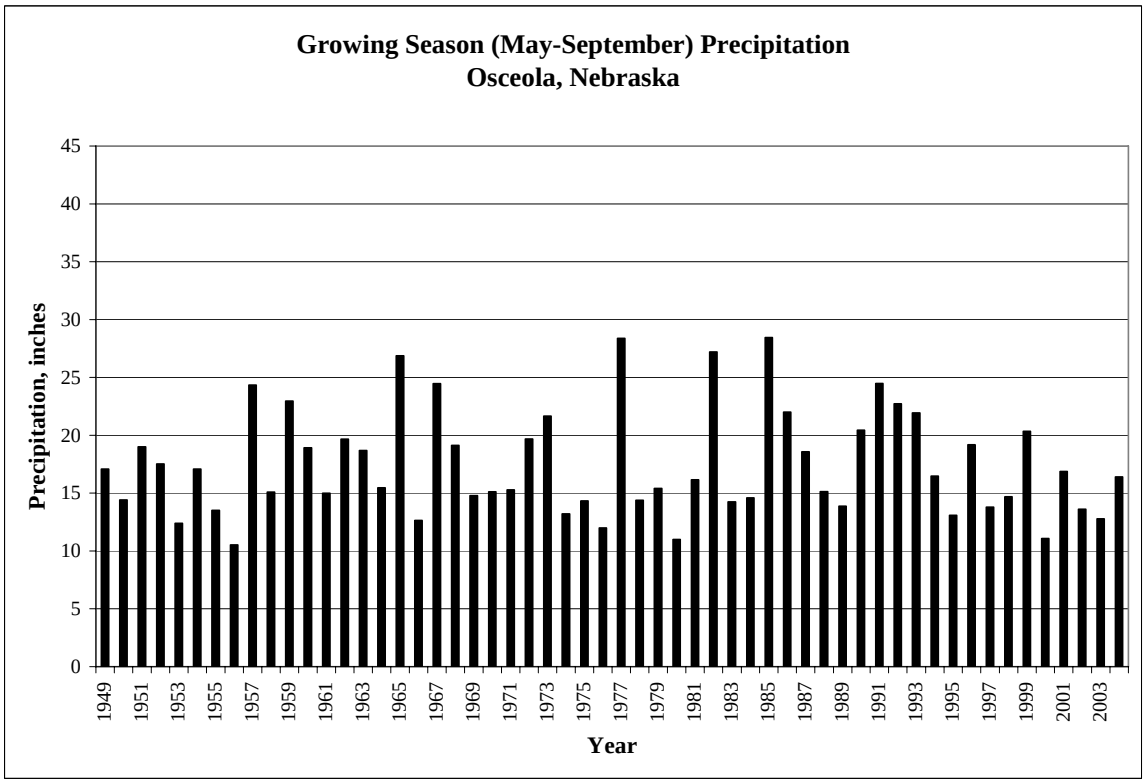


Figure BB-13. Annual Precipitation at Seward, Nebraska.

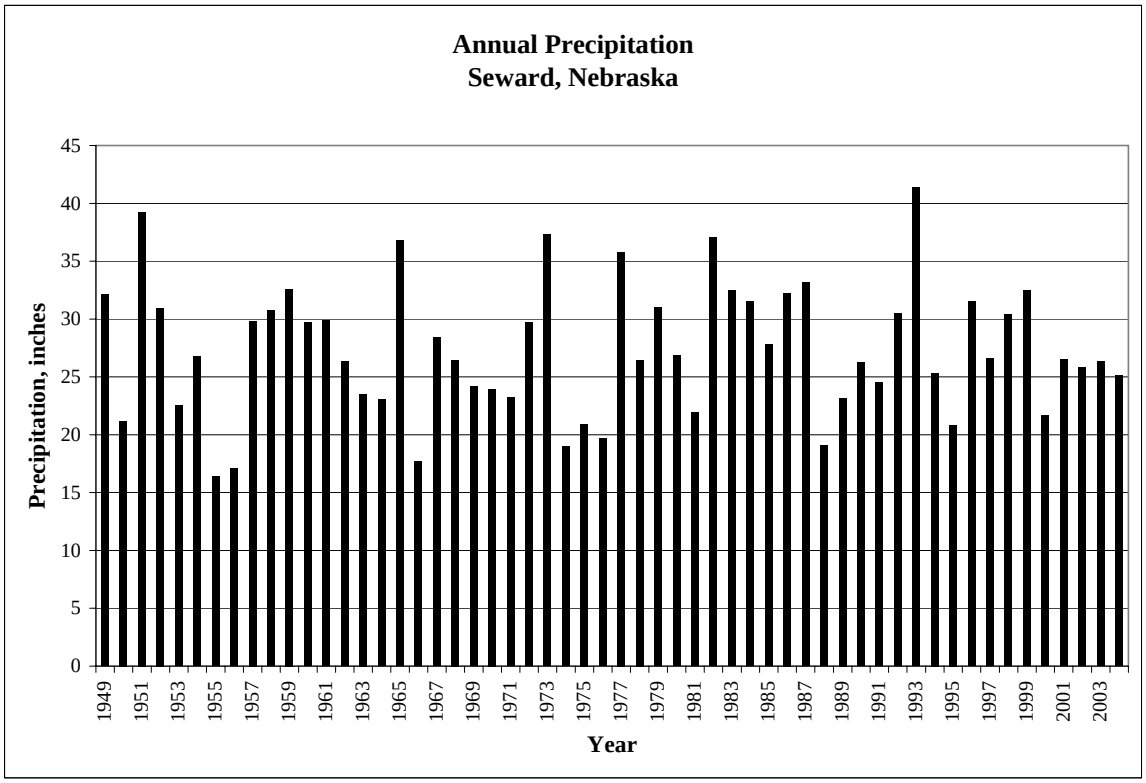


Figure BB-14. Growing Season (May-September) Precipitation at Seward, Nebraska.

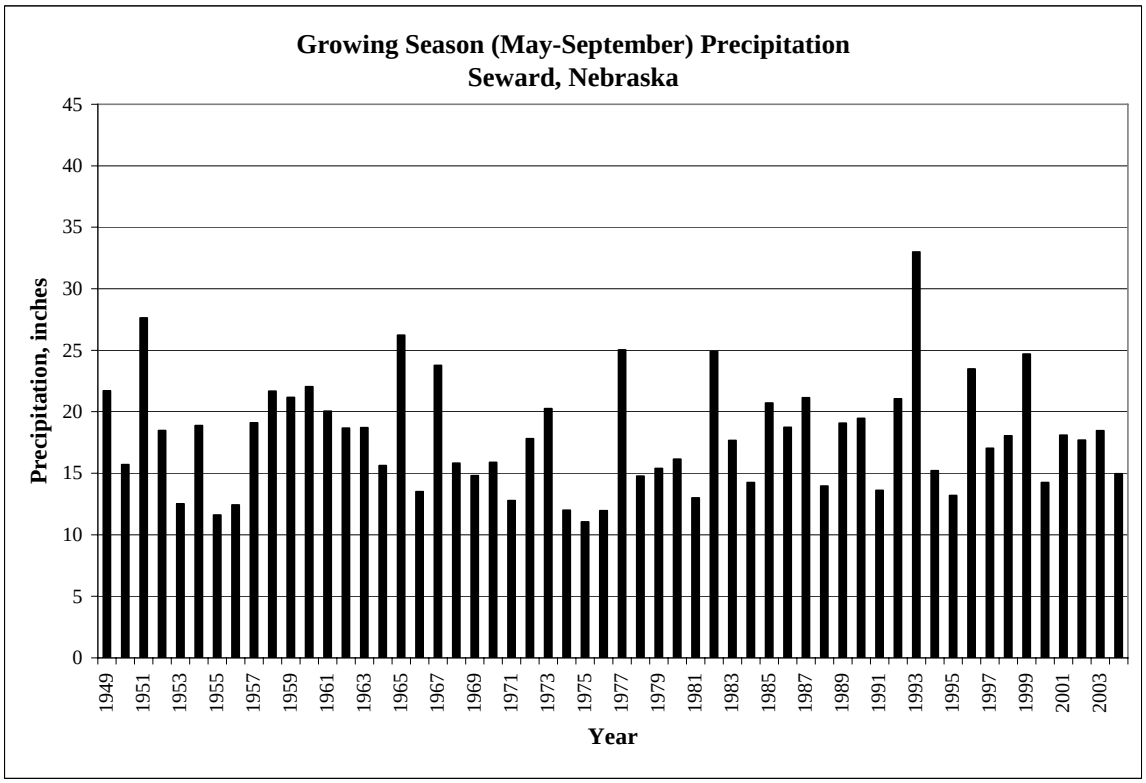


Figure BB-15. Annual Precipitation at York, Nebraska.

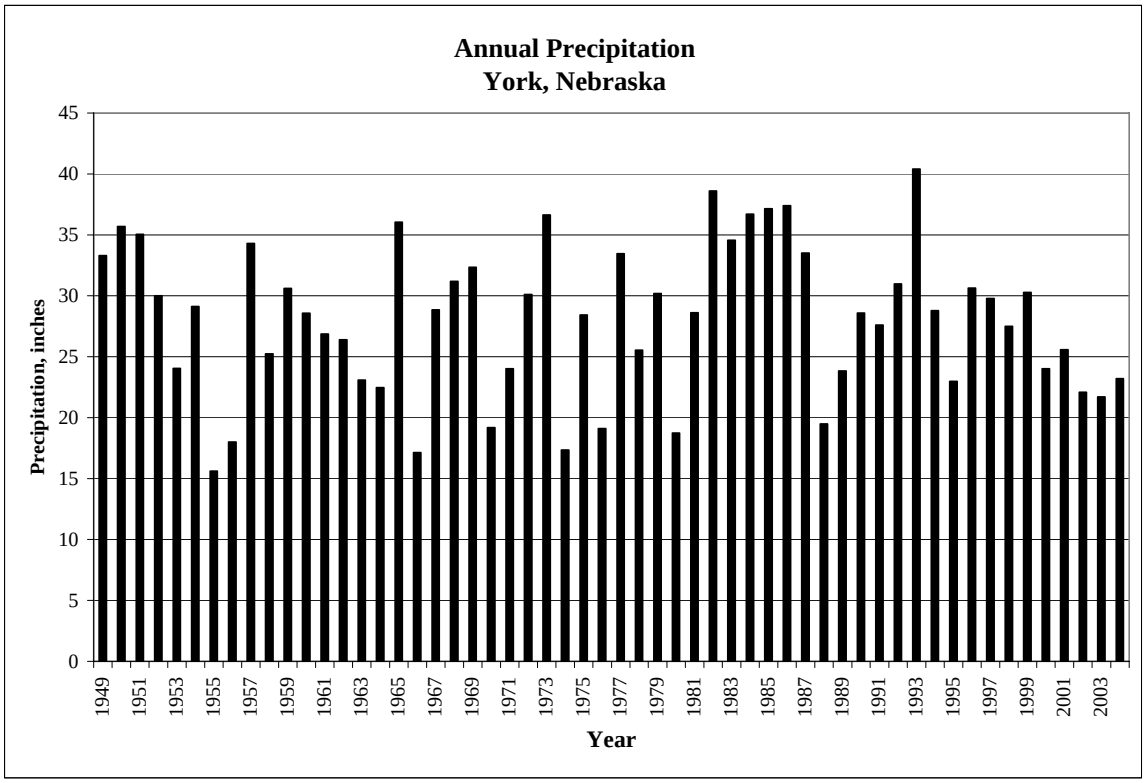
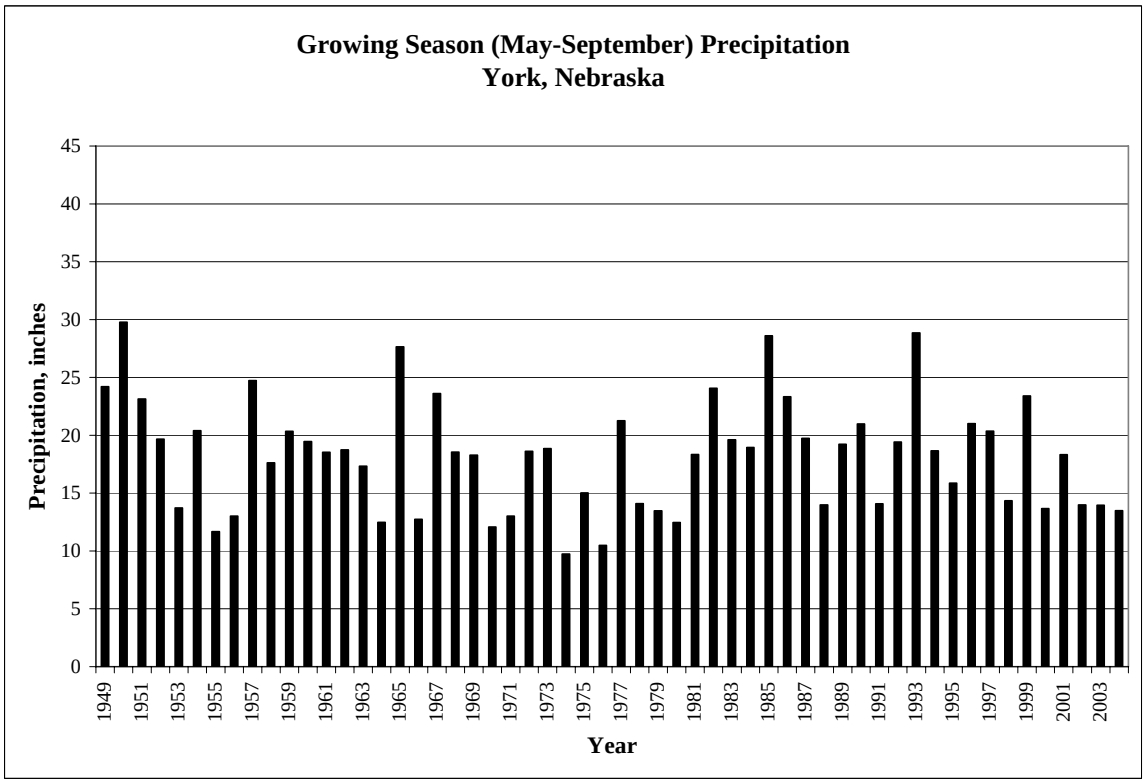
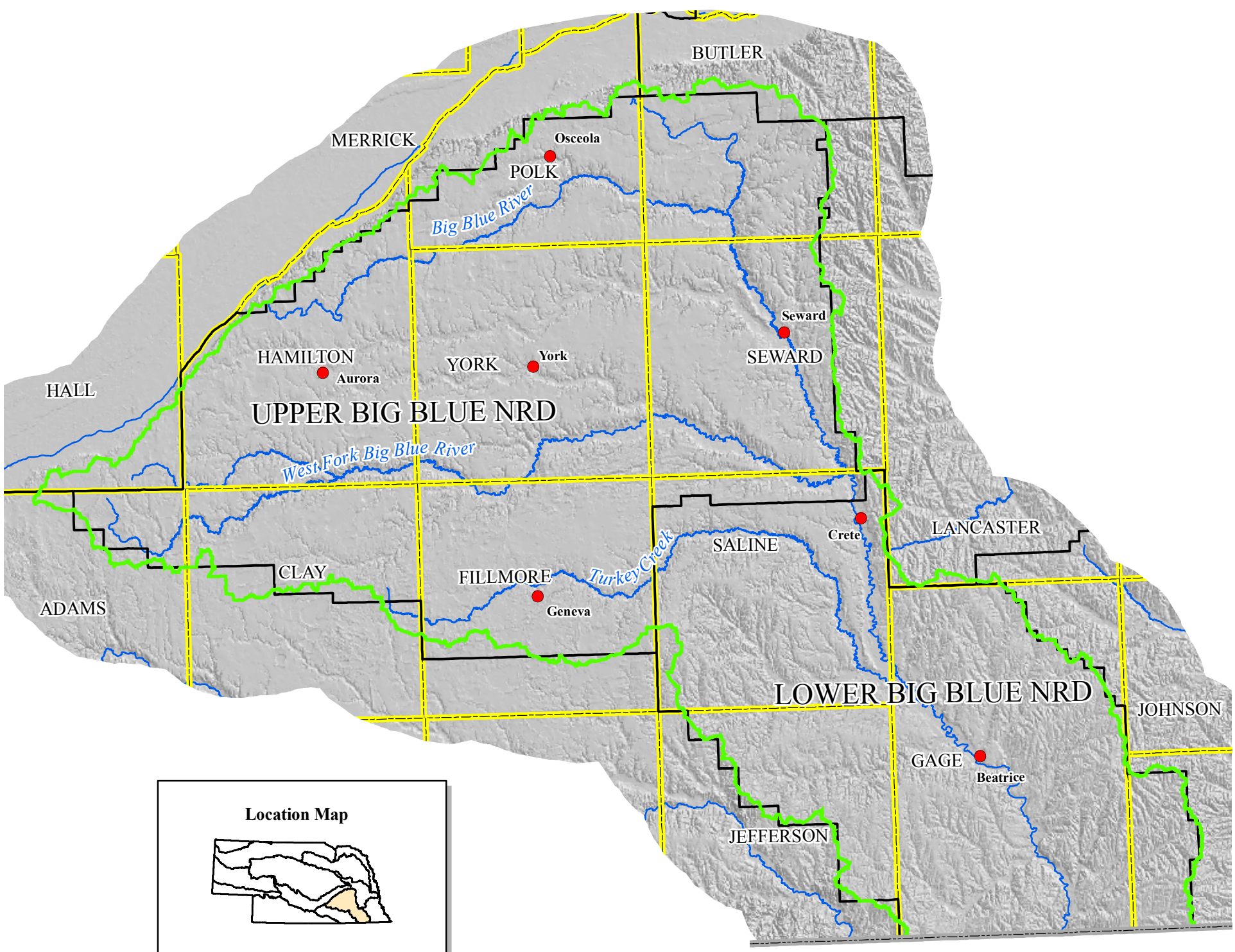


Figure BB-16. Growing Season (May-September) Precipitation at York, Nebraska.



Precipitation Gages
BIG BLUE RIVER BASIN

Planning and Assistance Division



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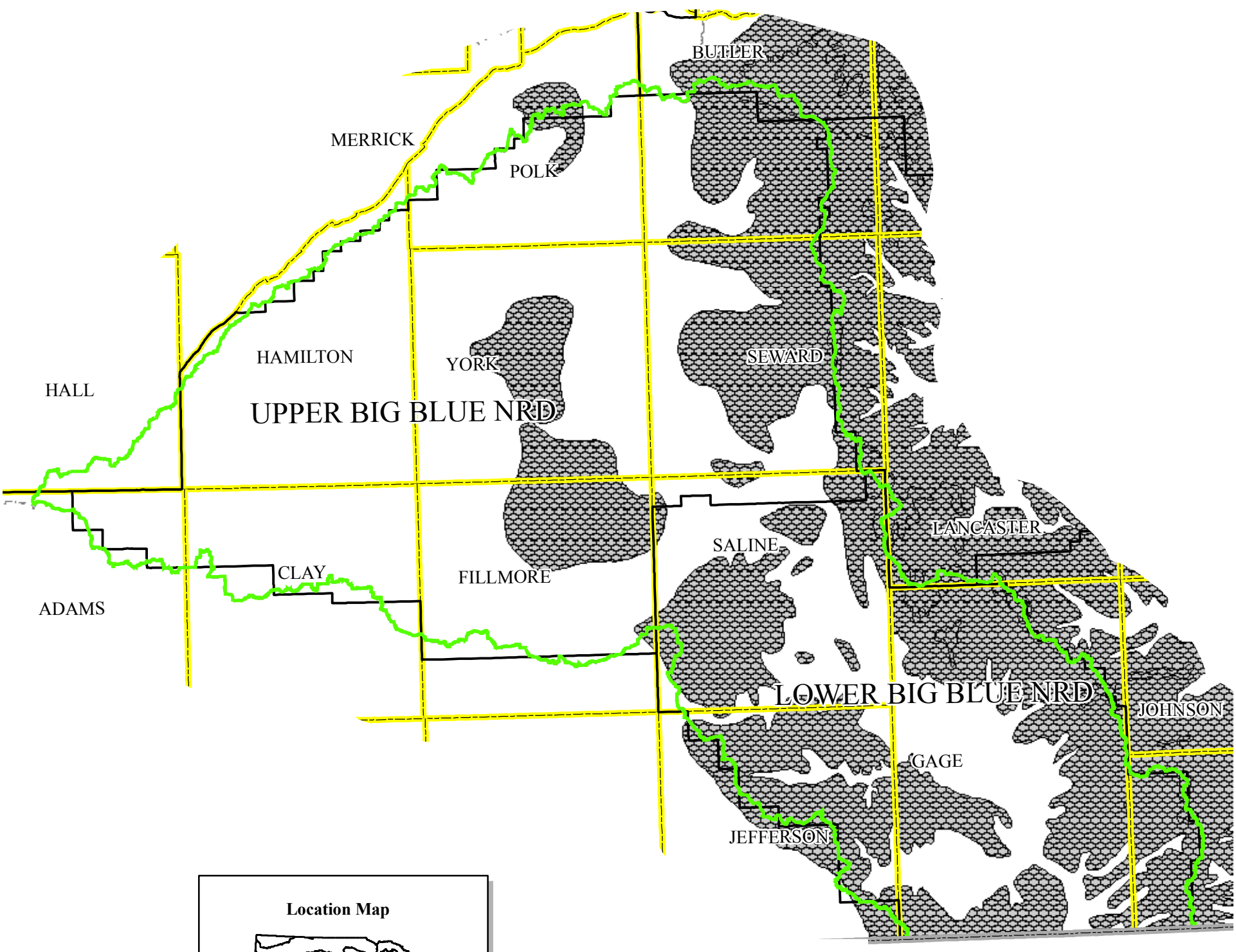
0 4 8 16 24 32 Miles

Figure BB-17.

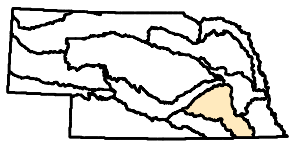
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Precipitation gages map produced by Jeff Shafer, October 18, 2005.

Glacial Till
BIG BLUE RIVER BASIN

Planning and Assistance Division



Location Map



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Glacial till information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

0 4 8 16 24 32 Miles

Figure BB-18.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Glacial till map produced by Kevin J. Schwartman, October 6, 2005

Table BB-1. – Aquifers in unconsolidated surficial deposits, (modified from Keech and Dreeszen, 1959, 1968; Keech, Dreeszen and Emery, 1967; Ellis, 1981; Johnson and Keech, 1959; Verstraeten, McGuire and Heckman,1998)

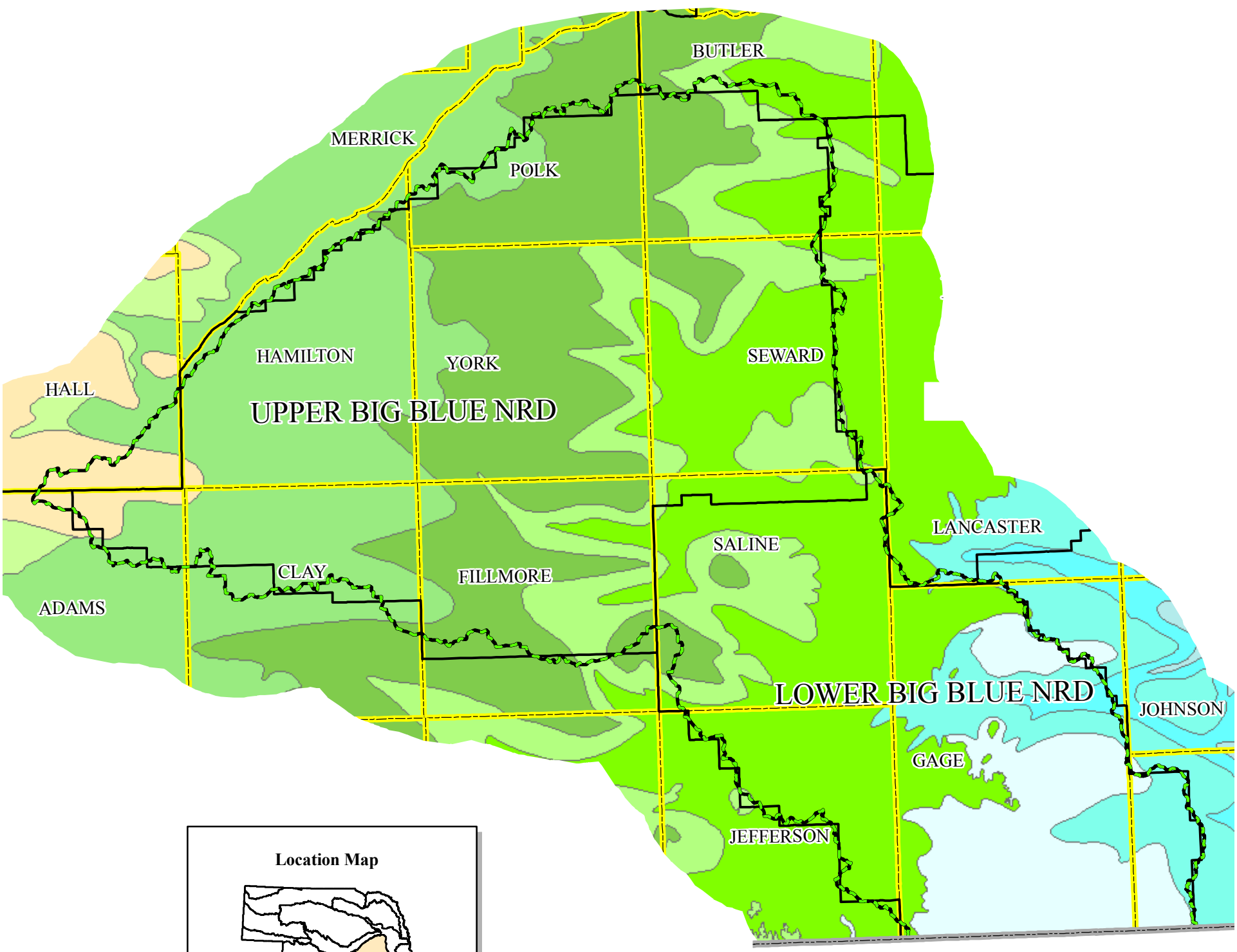
System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Quaternary	Undifferentiated fluvial and terrace deposits, Todd Valley sand.	Clay, silt, sand and fine gravel; underlie valley-side terraces and valley floor of drainage courses. Sand and gravel valley and terrace deposits, mostly along stream valleys.	30	Generally saturated, wells yield water at a moderate rate.
	Crete Formation, Undifferentiated fluvial, lacustrine and eolian deposits.	Sand and gravel channel-fill deposits. Silt, sand and gravel restricted to broad valleys.	130	Generally saturated where thick and coarse textured, yields water to wells at a high rate.
	Sappa Formation	Stratified deposits of silt, clay sand and gravel.	60	Sand lenses yield water at a slow rate in wells.
	Grand Island Formation	Stream deposited sand and gravel with a persistent aqueous-eolian deposited silt and clay layer.	200	Yields abundant water to wells.
	Red Cloud sand and gravel and Holdrege Formation	Stream deposited sand and gravel with nonpersistant silt and clay, probably of aqueous-eolian origin.	200	Yields abundant water to wells.

Table BB-2. – Characteristics of bedrock aquifers (modified from Keech and Dreeszen, 1959, 1968; Keech, Dreeszen and Emery, 1967; Ellis, 1981; Johnson and Keech, 1959; Verstraeten, McGuire and Heckman,1998)

System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Tertiary	Ogallala Group	Silt, sandy and clayey silt with lenses of sand and gravels, partly calcareous.	200	Not an important supply of water. May yield sufficient water to domestic wells.
Cretaceous	Niobrara Formation	Chalky shale, weathered in parts	380	Generally not known as a source of water but yields water to wells at a moderate rate where it is fractured.
	Dakota Sandstone	Interbedded clay shale, sandy shale and sandstone.	675	Moderately to highly mineralized water. Sandstone layers yield water at a moderate rate to wells.
Permian	Undifferentiated limestone and shales	Interbedded limestone and shales.	700	Limestone used as minor aquifers, yield water to wells where secondary porosity has developed.

Bedrock Geology
BIG BLUE RIVER BASIN

Planning and Assistance Division



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Bedrock geology information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

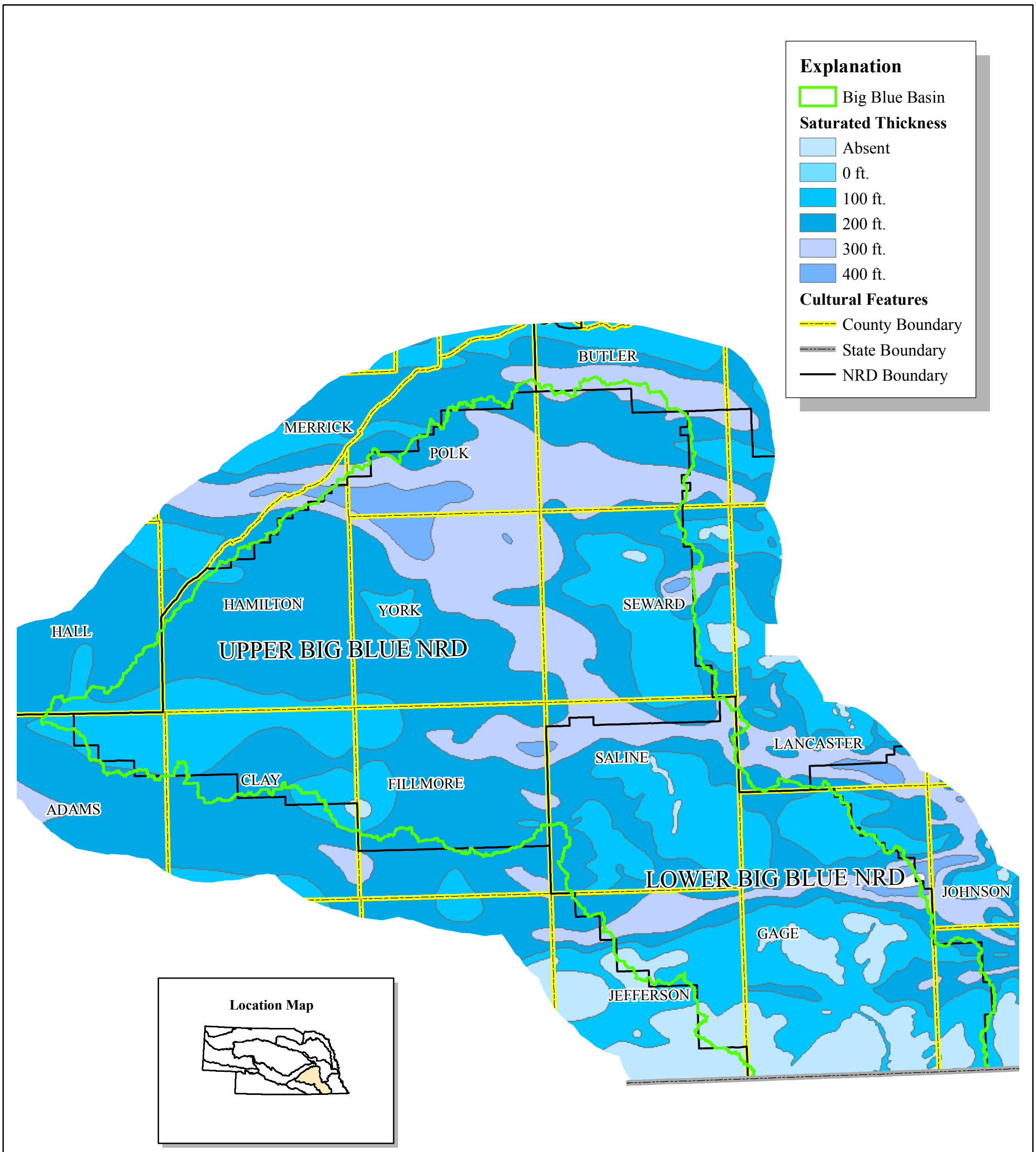
0 4 8 16 24 32 Miles

Figure BB-19.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Bedrock geology map produced by Kevin J. Schwartman, October 6, 2005

Saturated Thickness
BIG BLUE RIVER BASIN

Planning and Assistance Division



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Saturated thickness information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

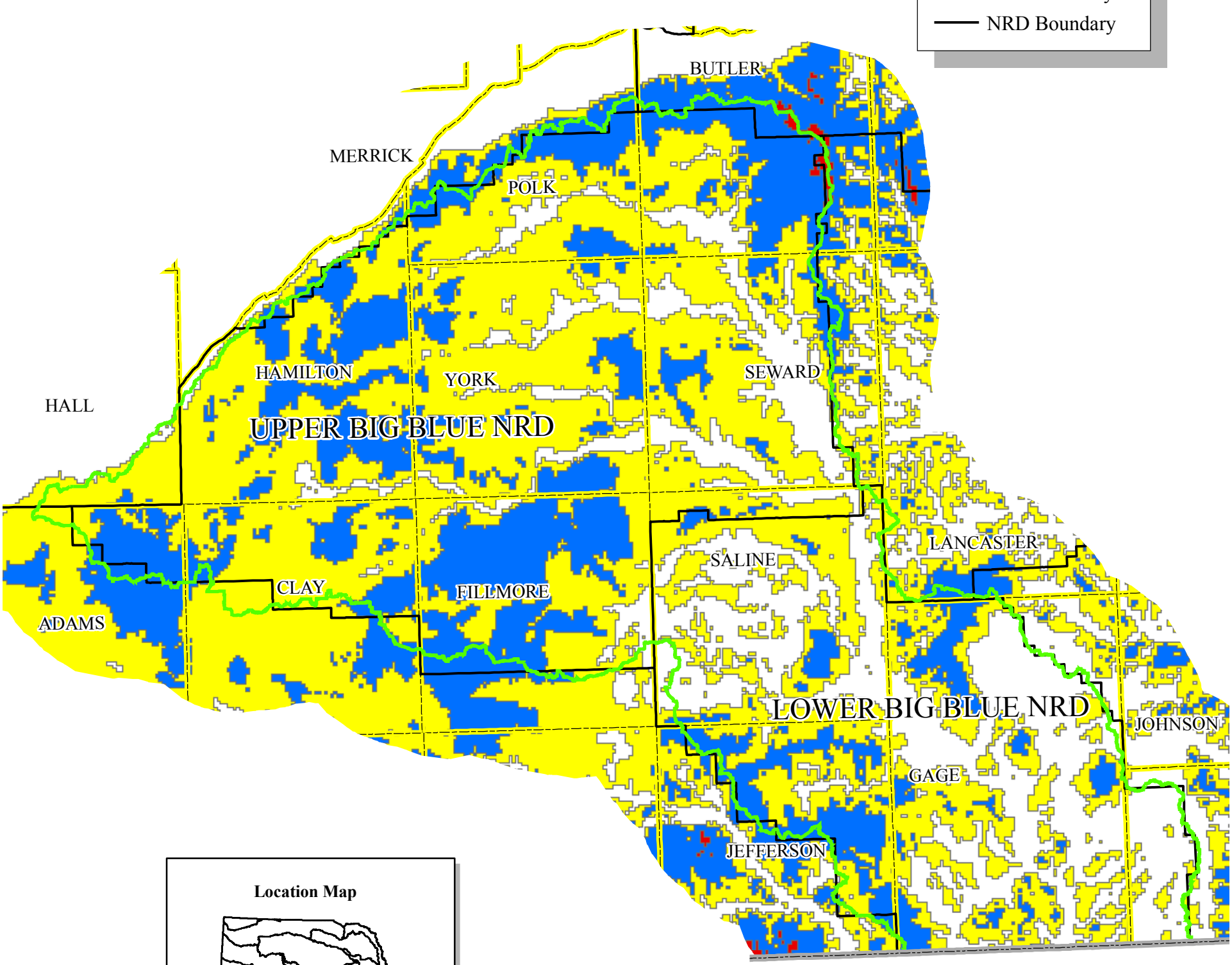
0 4 8 16 24 32 Miles

Figure BB-20.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Saturated thickness map produced by Kevin J. Schwartman, October 6, 2005

Depth to Water
BIG BLUE RIVER BASIN

Planning and Assistance Division



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Depth to water information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

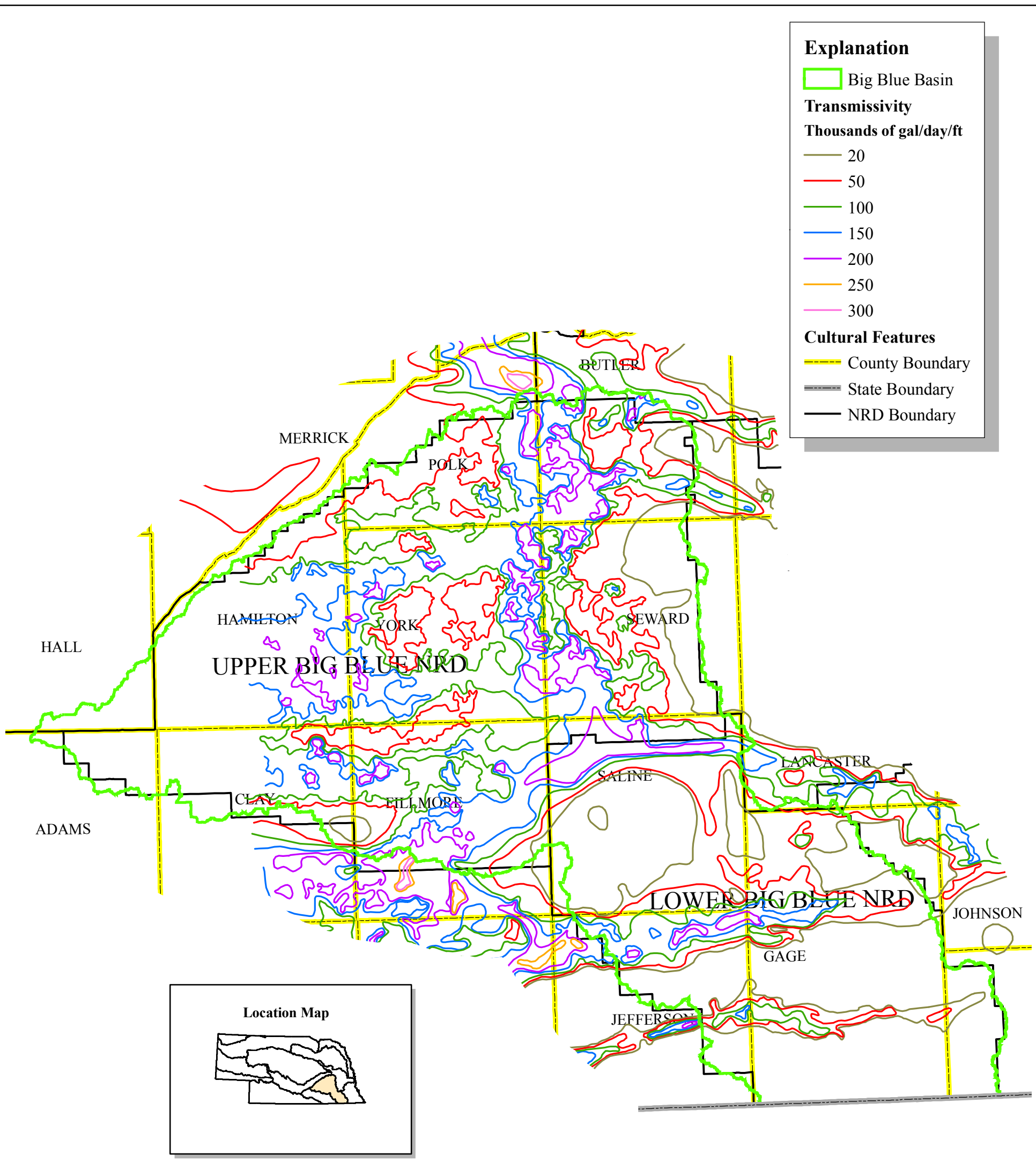
0 4 8 16 24 32 Miles

Figure BB-21.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Depth to water map produced by Kevin J. Schwartman, October 6, 2005

Planning and Assistance Division

Transmissivity
BIG BLUE RIVER BASIN



Transmissivity information provided by the UNL Conservation and Survey Division in: Summerside, S., Olafsen-Lackey, S., Goeke, J., and Myers, W., 2005, Mapping of Aquifer Properties – Transmissivity and Specific Yield – for Selected River Basins in Central and Eastern Nebraska.

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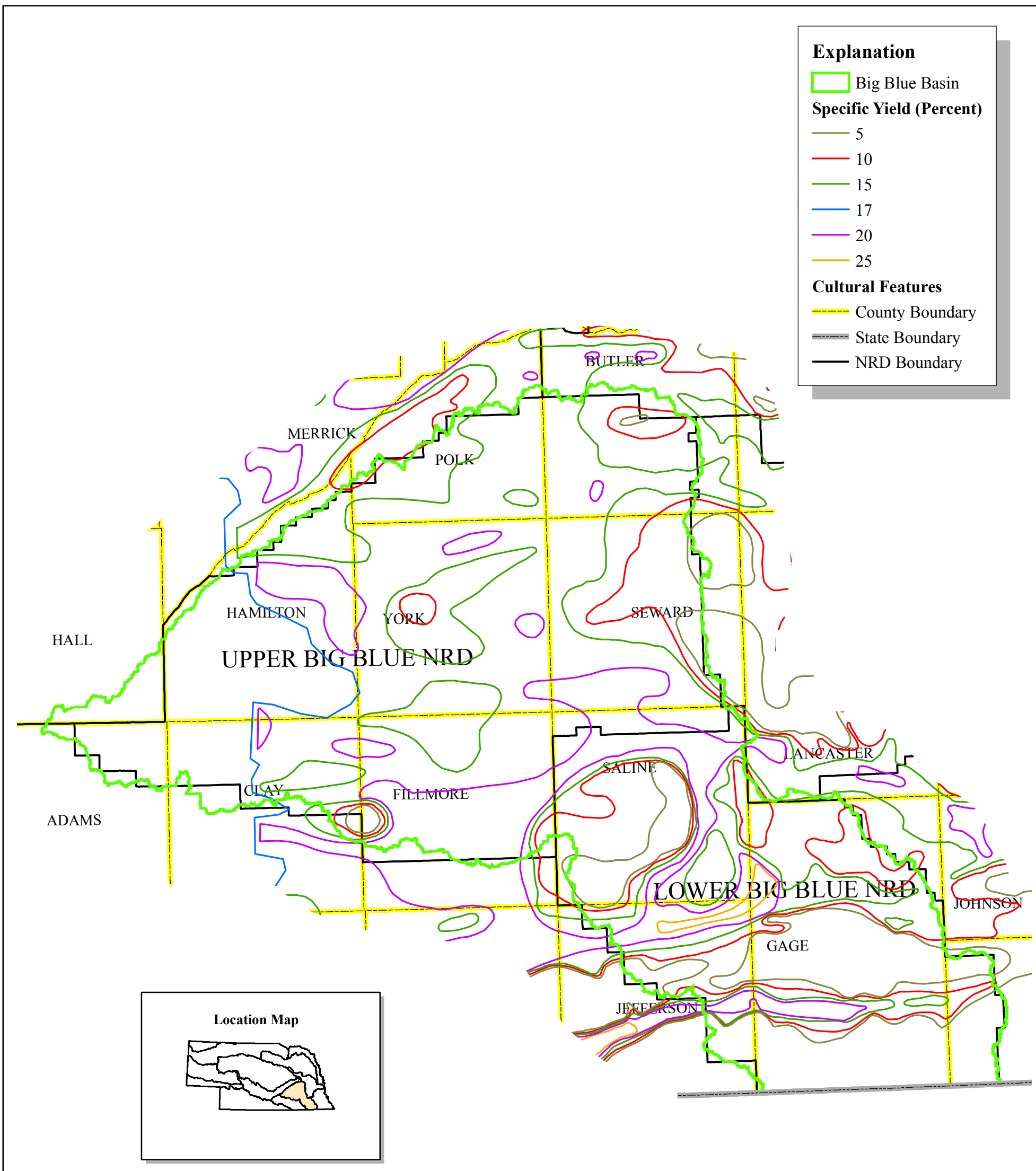
0 4 8 16 24 32 Miles

Figure BB-22.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Transmissivity map produced by Kevin J. Schwartman, October 6, 2005

Planning and Assistance Division

Specific Yield
BIG BLUE RIVER BASIN



Specific yield information provided by the UNL Conservation and Survey Division in: Summerside, S., Olafsen-Lackey, S., Goeke, J., and Myers, W., 2005, Mapping of Aquifer Properties – Transmissivity and Specific Yield – for Selected River Basins in Central and Eastern Nebraska.

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0 4 8 16 24 32 Miles

Figure BB-23.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Specific yield map produced by Kevin J. Schwartman, October 6, 2005

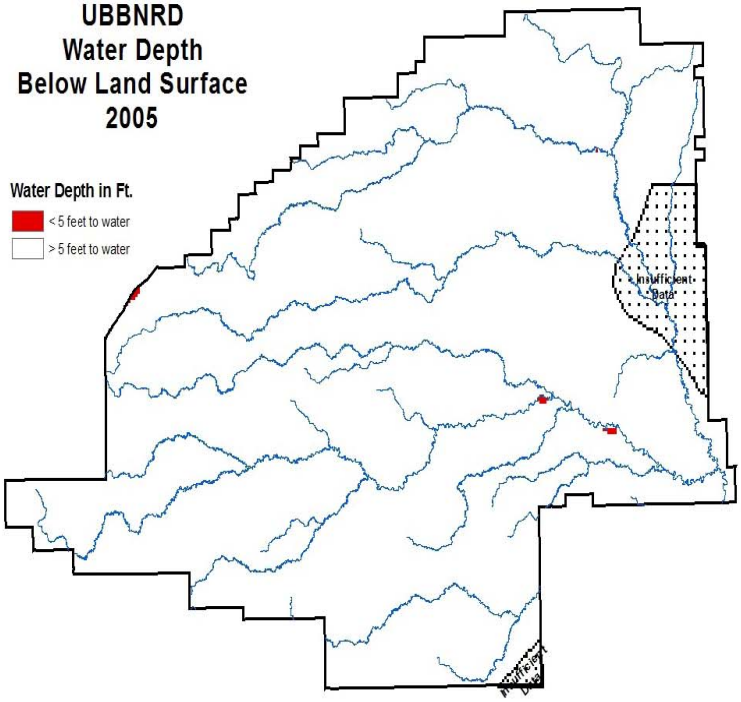


Figure BB-24

GENERAL DEPTH OF GROUNDWATER BELOW LAND SURFACE

Bitner, R.J., 2005

1995 Ground Water Table
BIG BLUE RIVER BASIN

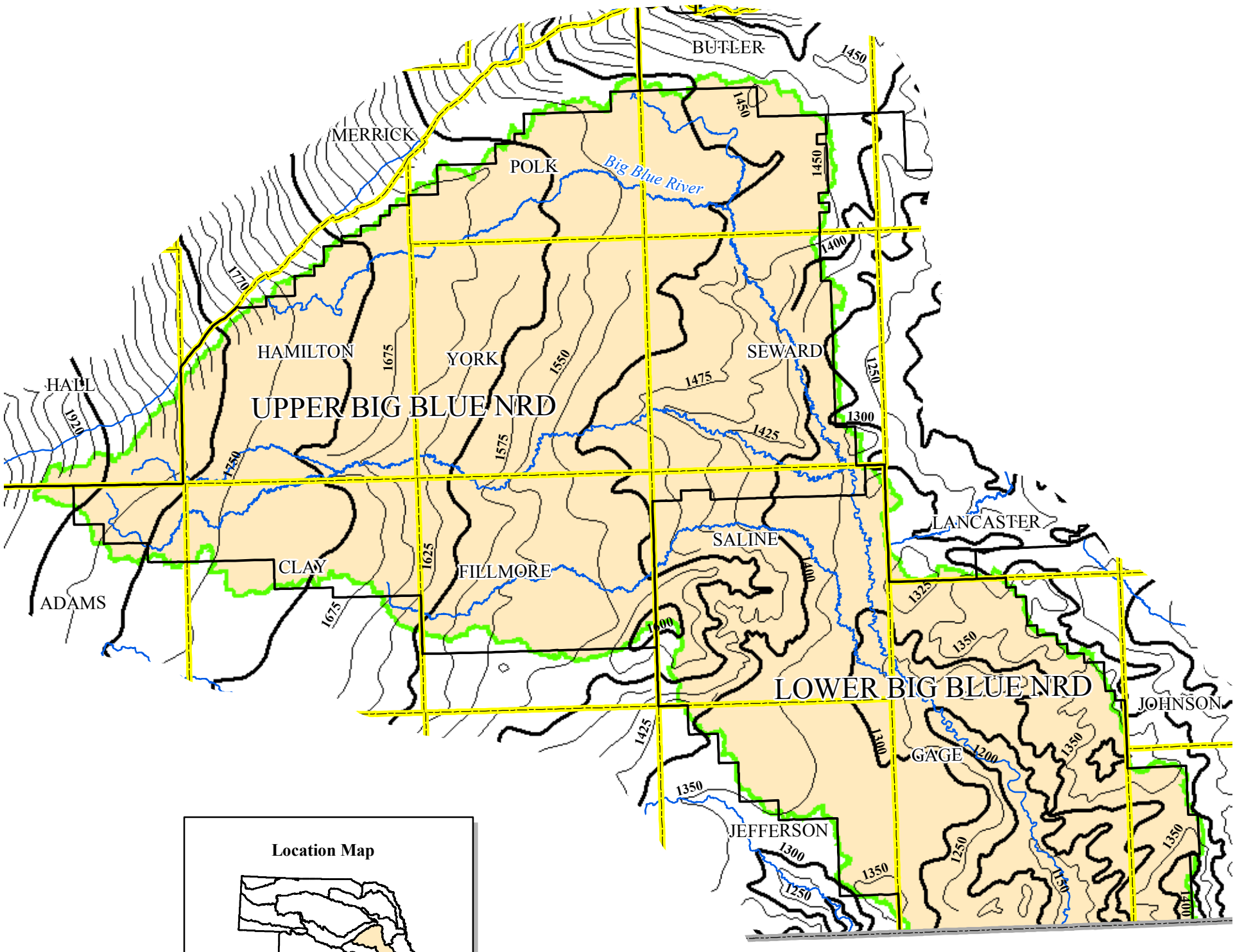
Planning and Assistance Division

Explanation

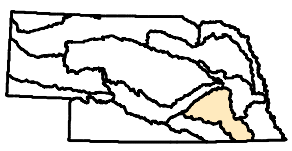
- Big Blue Basin
- 1995 Water Table
- Major Streams

Cultural Features

- County Boundary
- State Boundary
- NRD Boundary



Location Map



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Water table information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

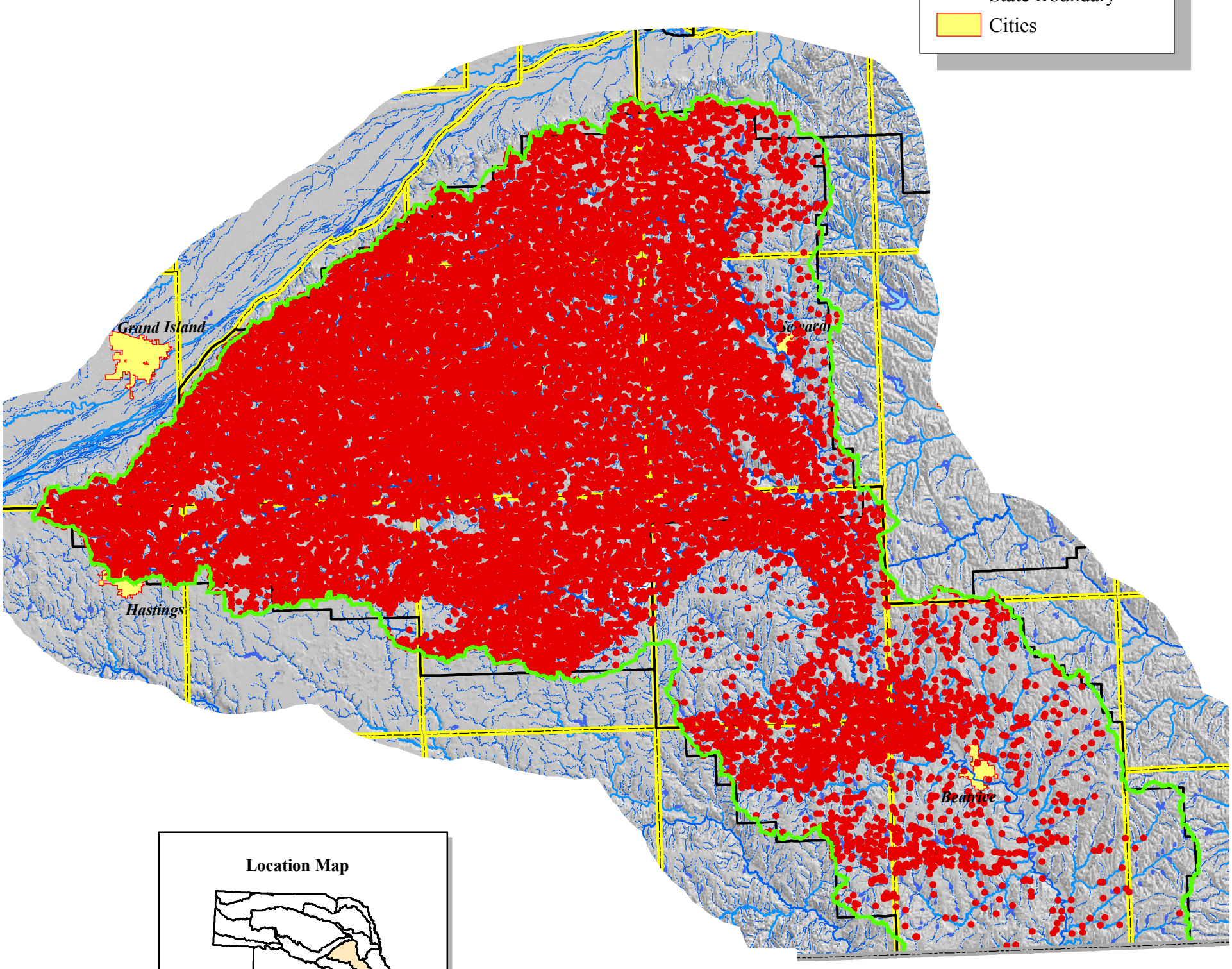
0 4 8 16 24 32 Miles

Figure BB-25.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Water table map produced by Kevin J. Schwartman, October 6, 2005

Depletive Ground Water Wells
BIG BLUE RIVER BASIN

Planning and Assistance Division



Depletive well infomation is from the DNR Registered Ground Water Well Database, as of October 1, 2005 and include wells used for aquiculture, commercial, domestic, irrigation, public water supply, dewatering, stock and others except wells for non-consumptive uses.

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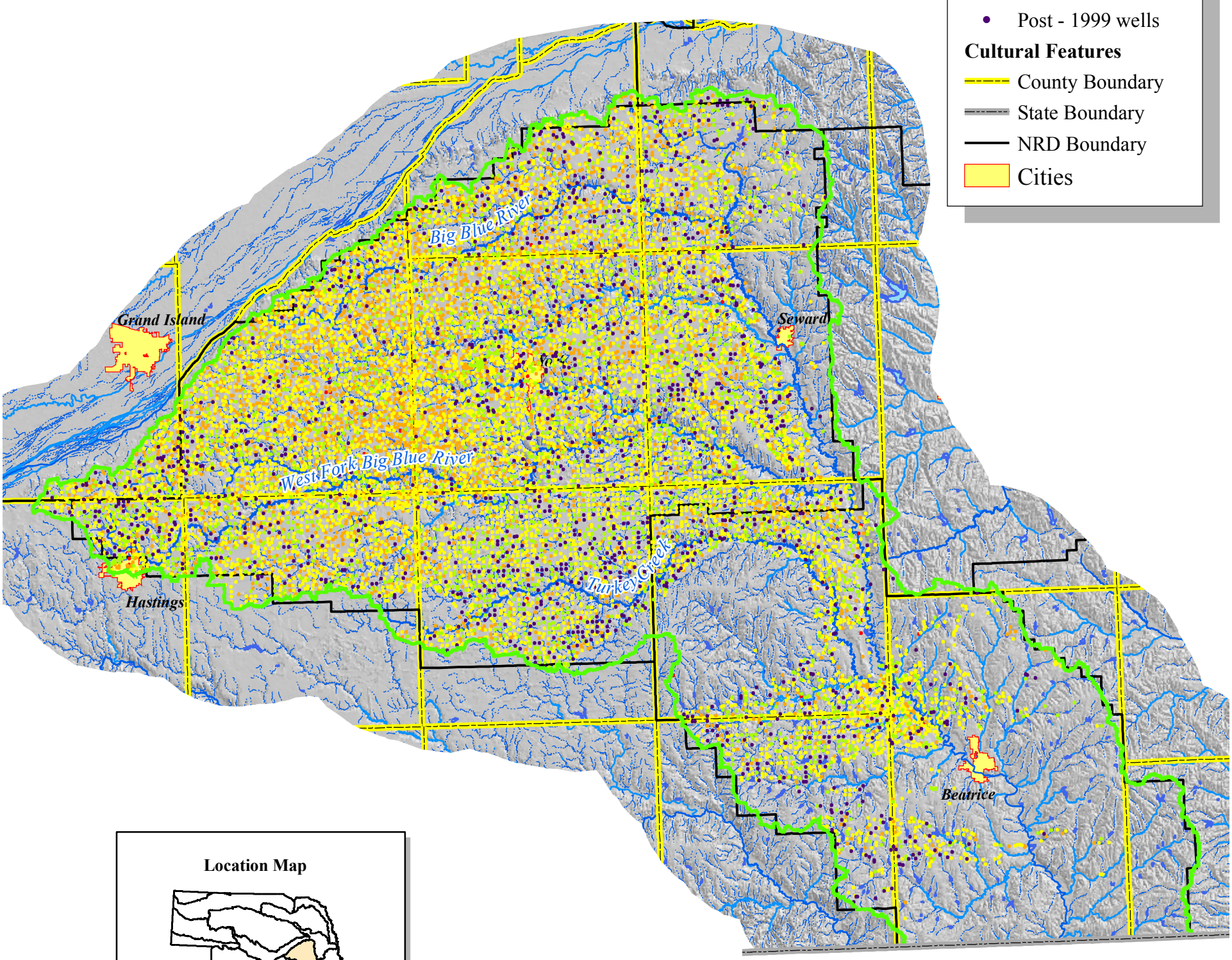
0 4 8 16 24 32 Miles

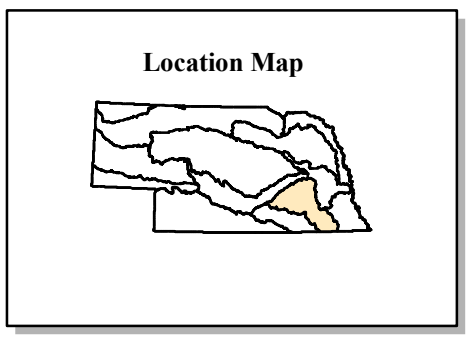
Figure BB-26.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Depletive ground water wells map produced by Shuhai Zheng, October 4, 2005.

High Capacity Wells by Completion Years
BIG BLUE RIVER BASIN

Planning and Assistance Division





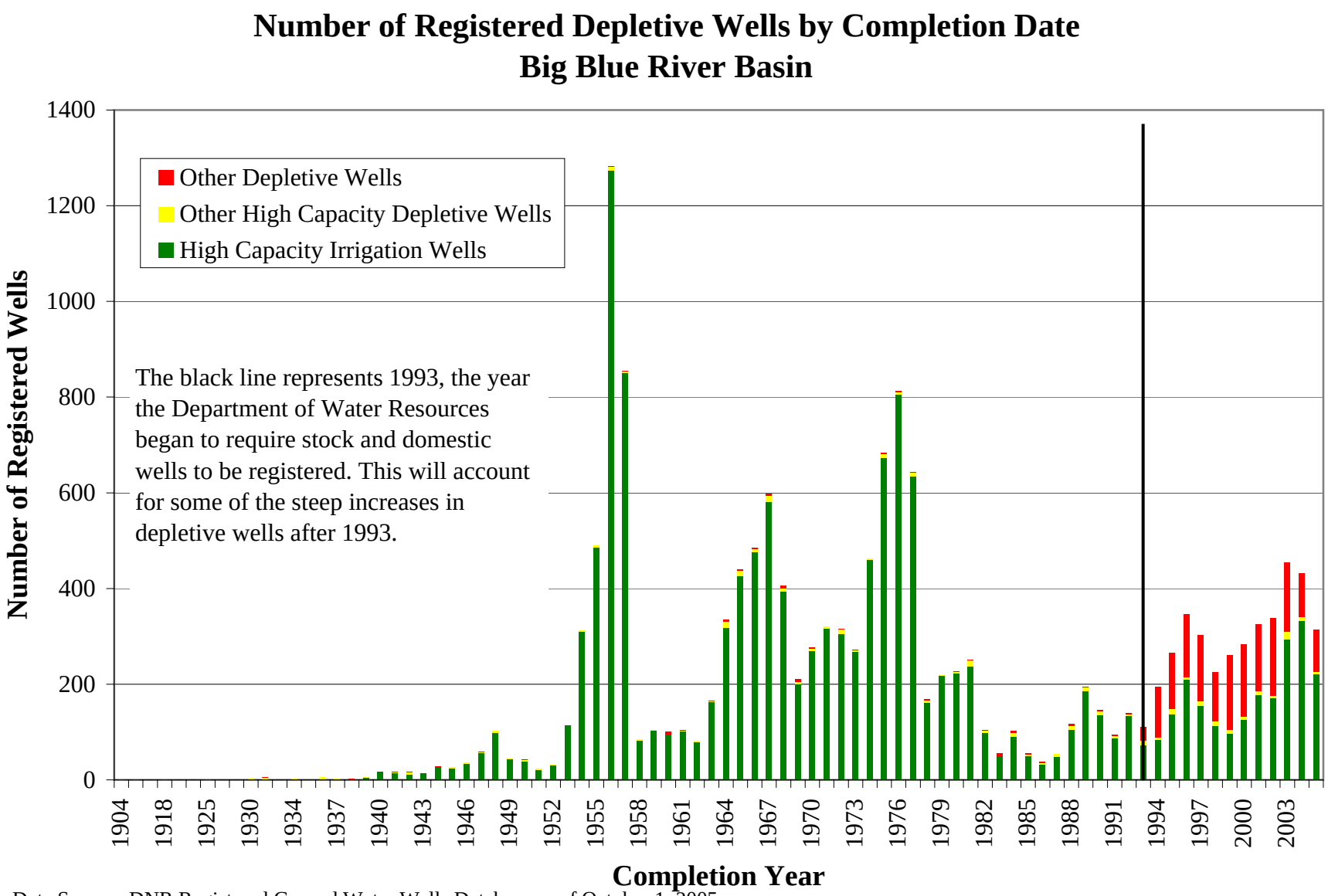
High Capacity well infomation is from the DNR Registered Ground Water Well Database, as of October 1, 2005 and includes depletive wells with registered pumping rates equal to or greater than 50 gpm.

This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.

0 4 8 16 24 32 Miles

Figure BB-27

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
High capacity wells map produced by Shuhai Zheng, November 10, 2005.



Data Source: DNR Registered Ground Water Wells Database as of October 1, 2005

Figure BB-28

By Shuhai Zheng, 12/13/2005

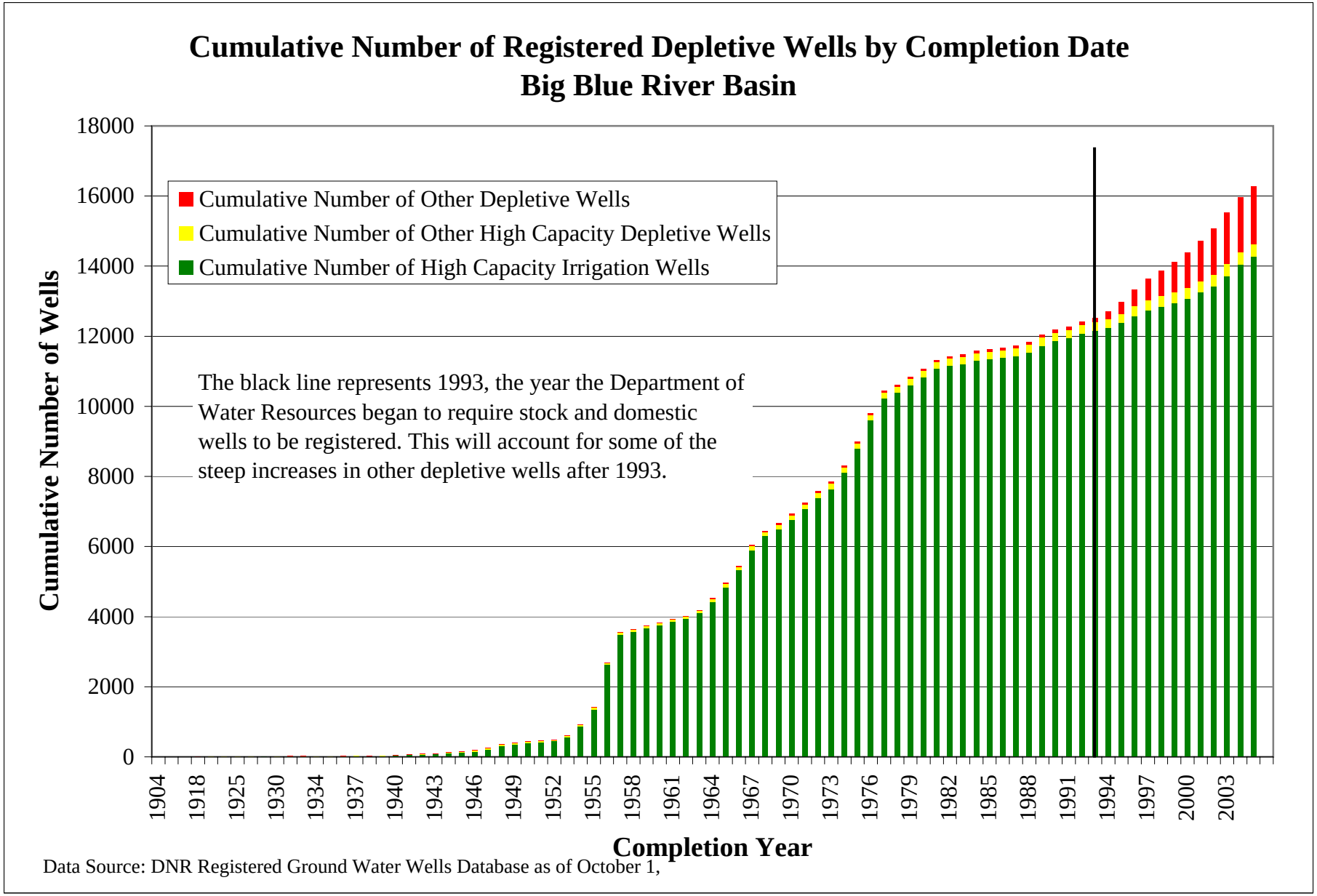
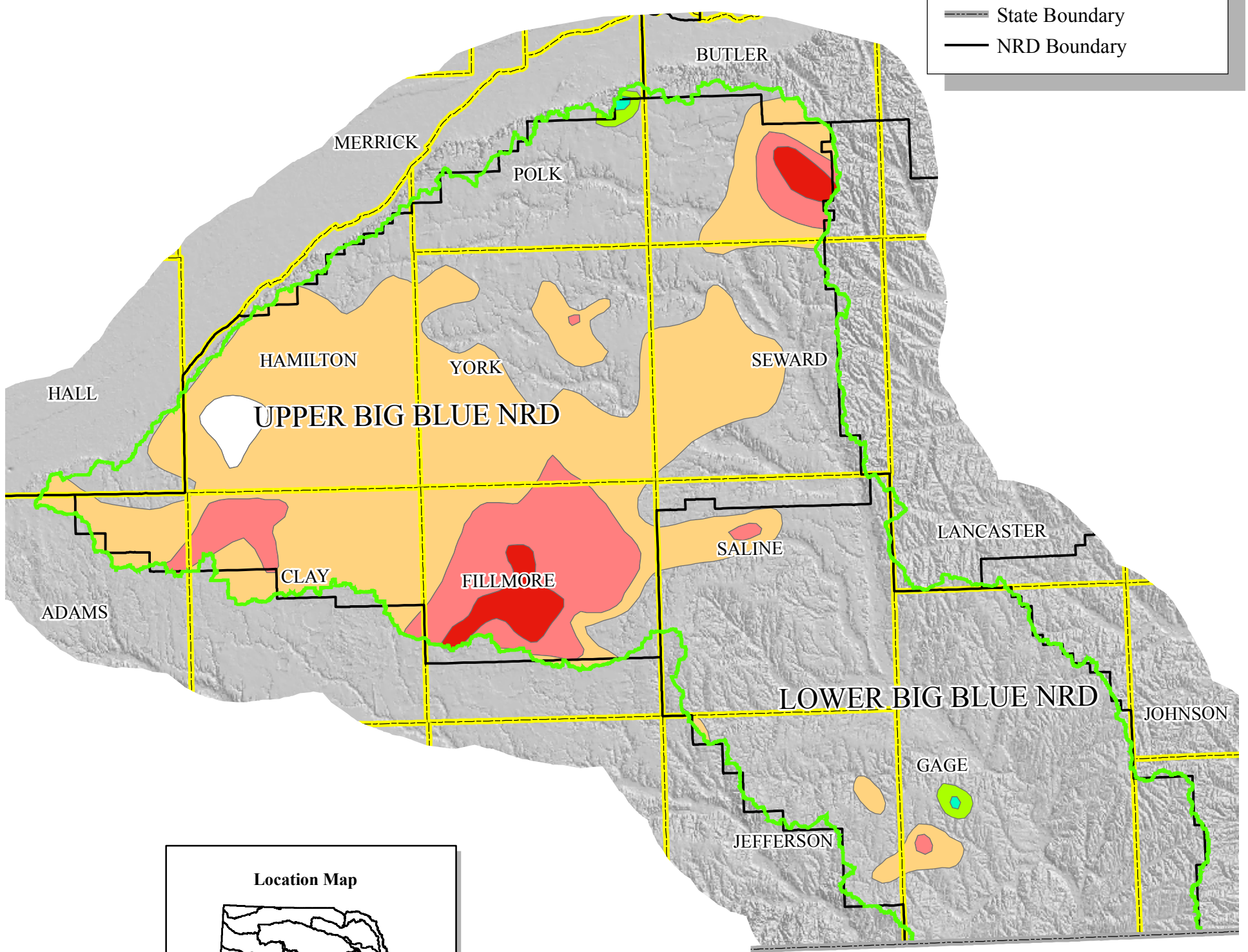


Figure BB-29

By Shuhai Zheng, 12/13/2005

Ground Water Level Changes
Pre-development to Spring 2005
BIG BLUE RIVER BASIN

Planning and Assistance Division



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Ground water level changes information provided by the UNL Conservation and Survey Division: http://csd.unl.edu/general/gis-datasets.asp.

0 4 8 16 24 32 Miles

Figure BB-30.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Ground water level changes added by Shuhai Zheng, October 13, 2005

Ground Water Hydrograph Locations
BIG BLUE RIVER BASIN

Planning and Assistance Division

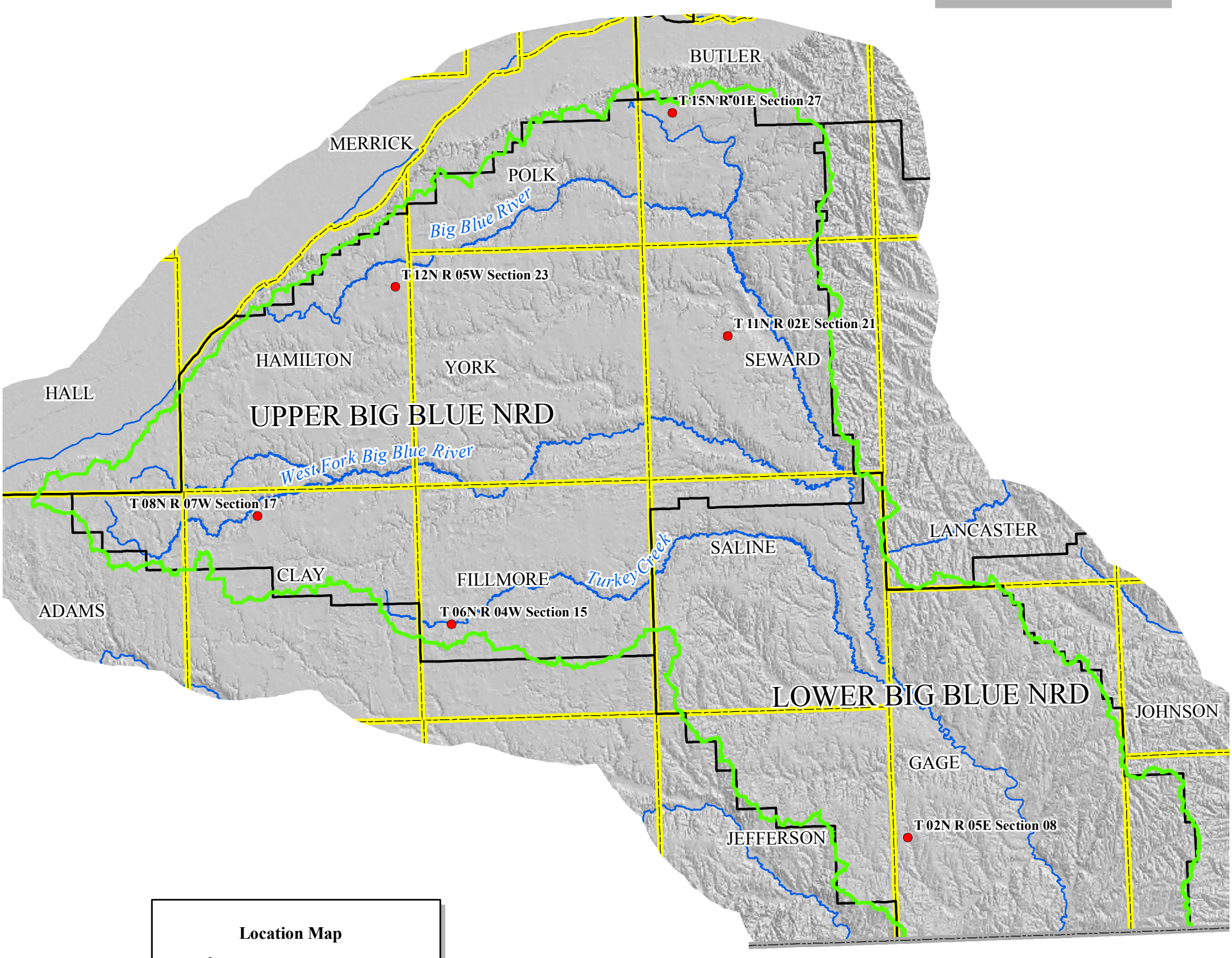

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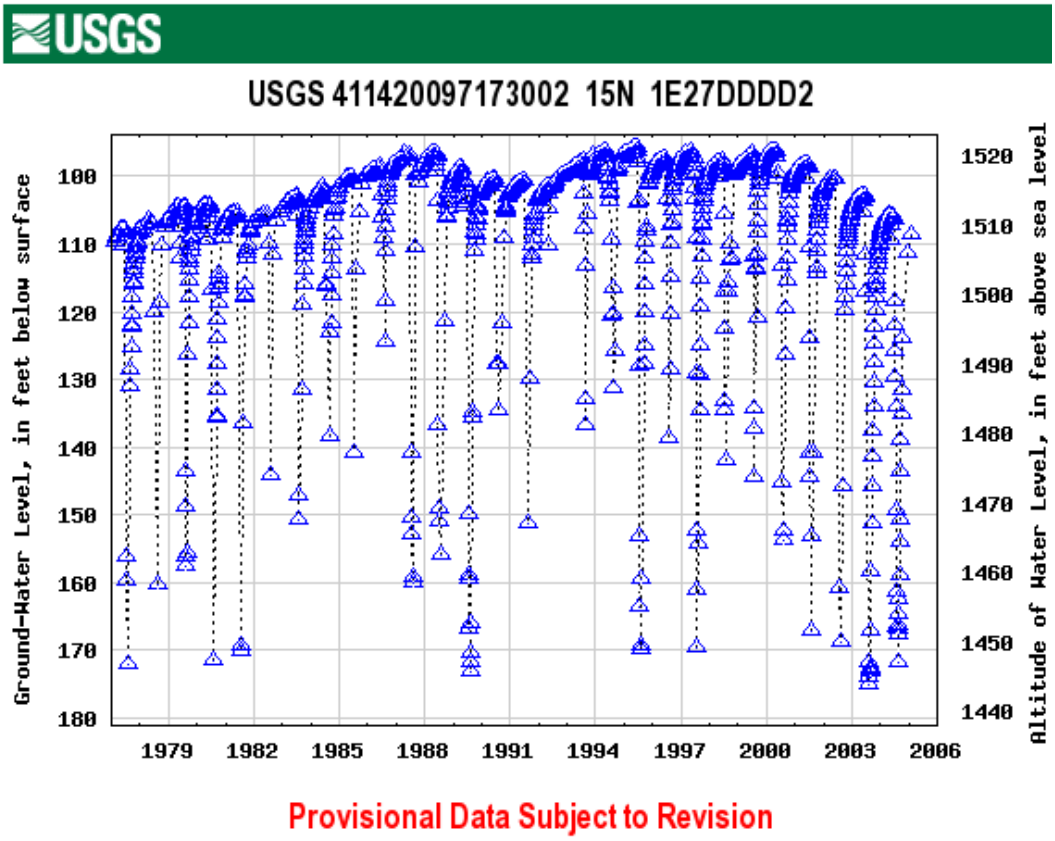
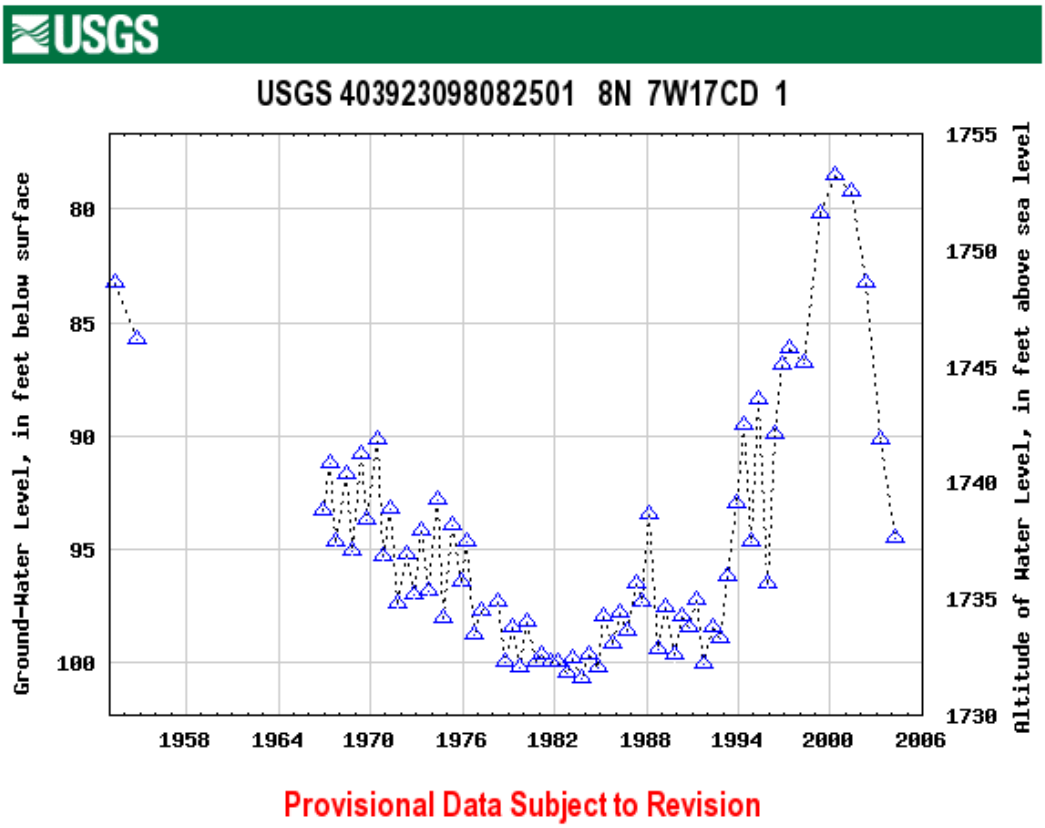
Figure BB-31.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Ground water hydrograph map produced by Kevin Schwartman, November 1, 2005.



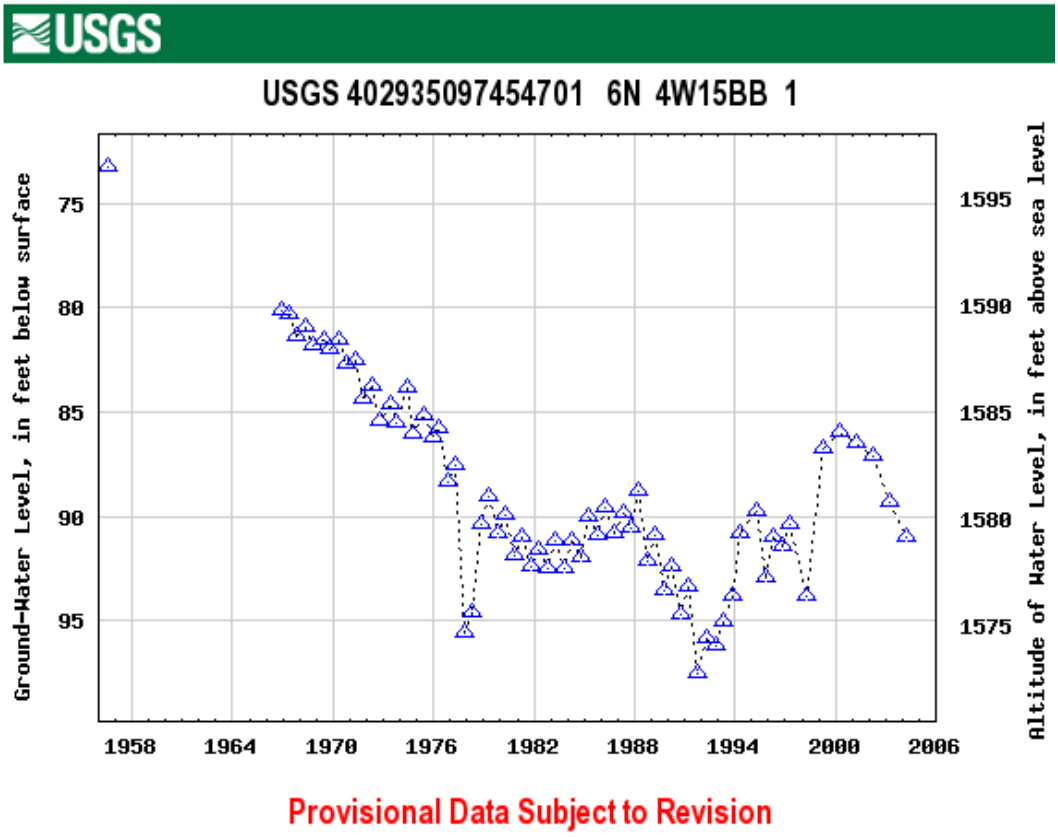
Butler County, Nebraska
Hydrologic Unit Code 10220003
Latitude 41°14'10", Longitude 97°17'30" NAD83
Land-surface elevation 1,618.00 feet above sea level NGVD29
The depth of the well is 210 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-32 (T 15N R 01E Section 27)



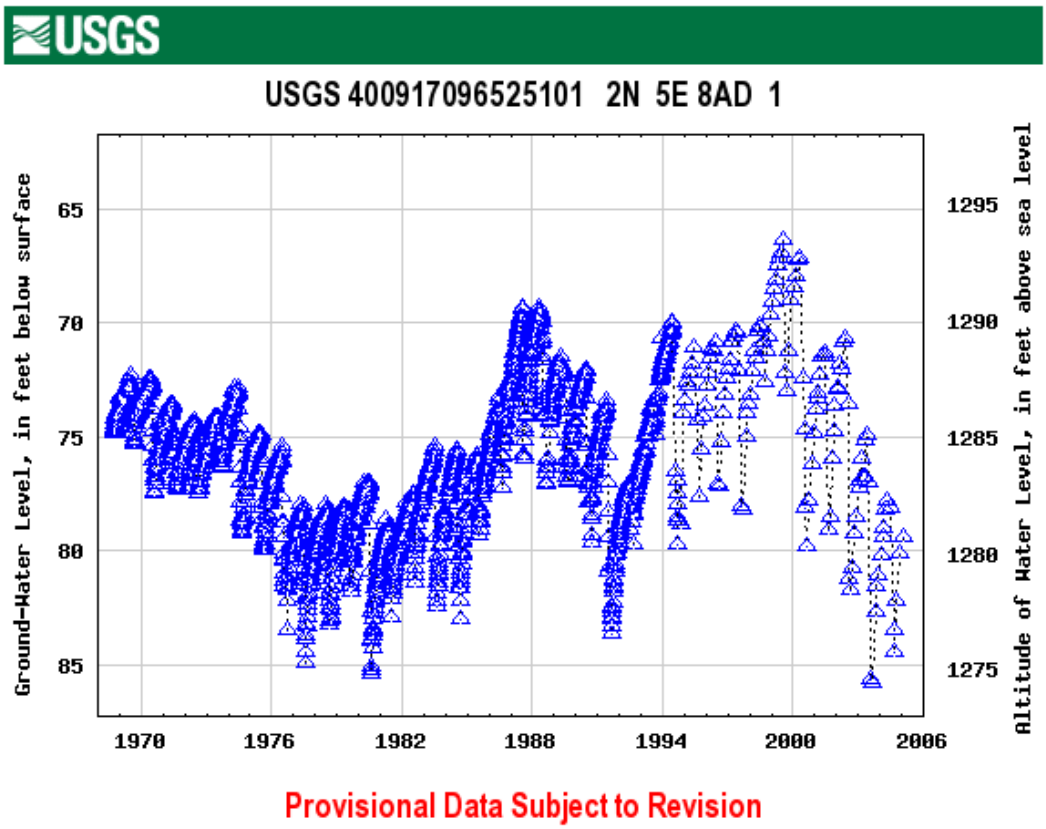
Clay County, Nebraska
Hydrologic Unit Code 10270203
Latitude 40°39'23", Longitude 98°08'25" NAD27
Land-surface elevation 1,832. feet above sea level NGVD29
The depth of the well is 165 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-33 (T 08N R 07W Section 17)



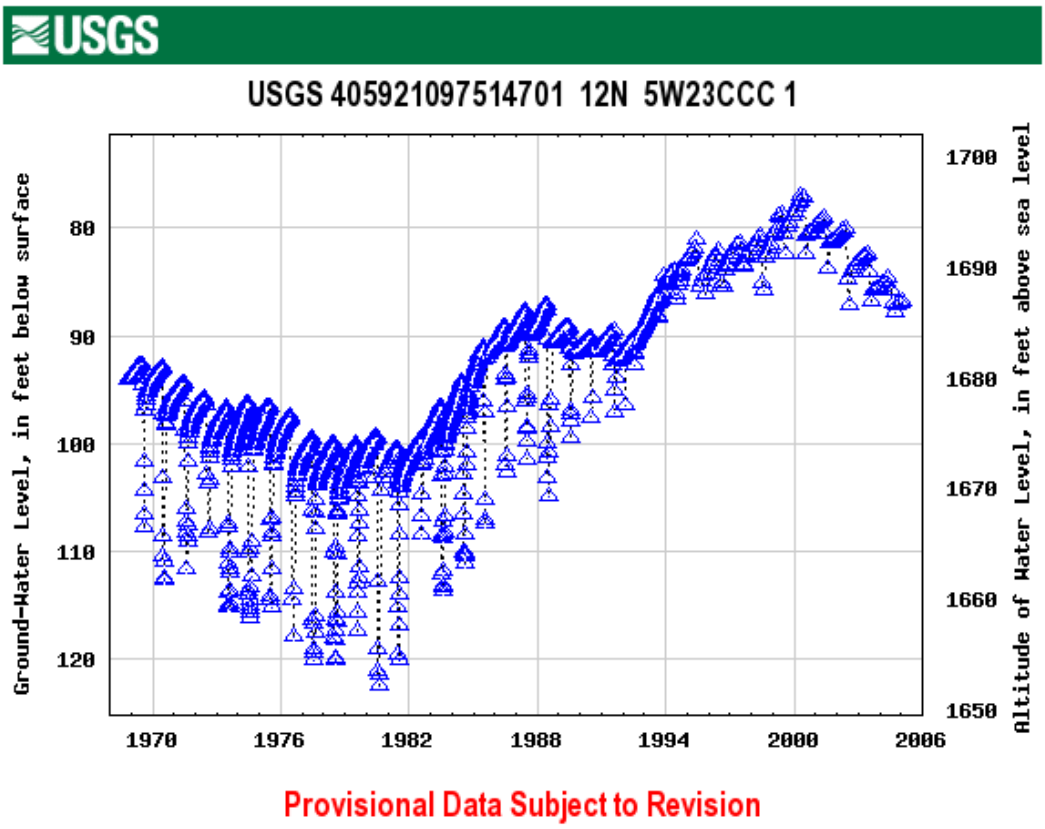
Fillmore County, Nebraska
Hydrologic Unit Code 10270204
Latitude 40°29'35", Longitude 97°45'47" NAD27
Land-surface elevation 1,670. feet above sea level NGVD29
The depth of the well is 180 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-34 (T 06N R 04W Section 15)



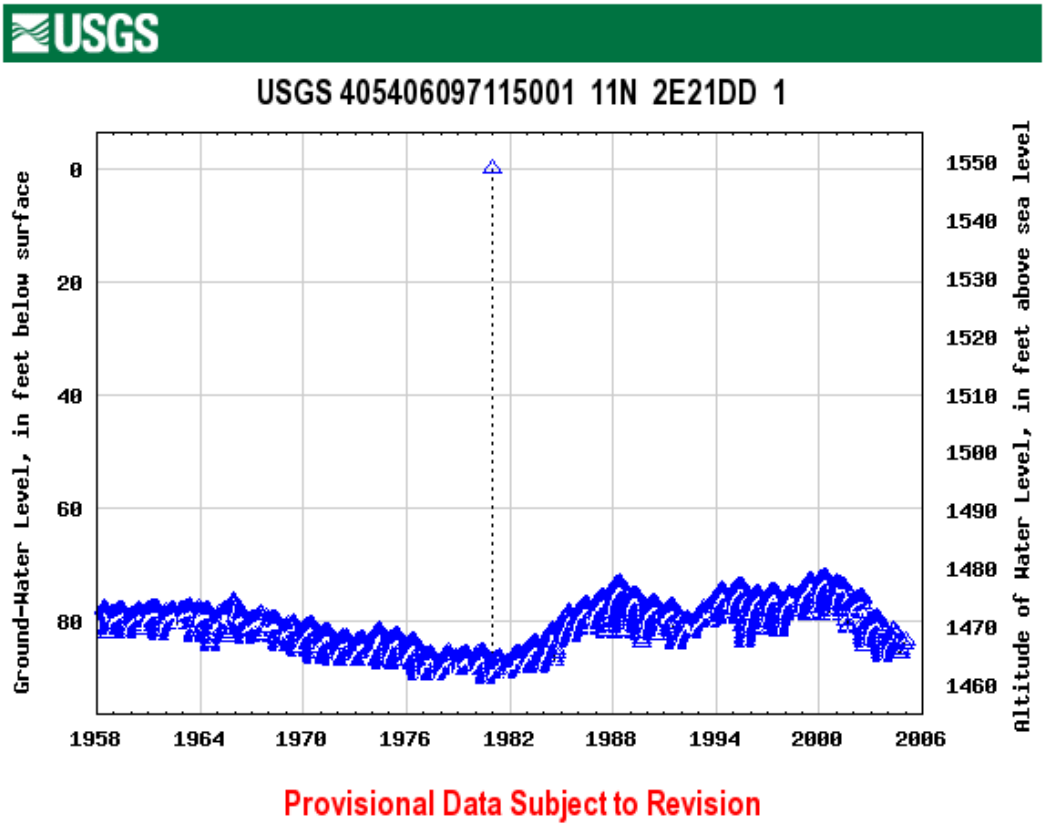
Gage County, Nebraska
Hydrologic Unit Code 10270202
Latitude 40°09'17", Longitude 96°52'51" NAD27
Land-surface elevation 1,360.00 feet above sea level NGVD29
The depth of the well is 167 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-35 (T 02N R 05E Section 08)



Hamilton County, Nebraska
Hydrologic Unit Code 10270201
Latitude 40°59'21", Longitude 97°51'47" NAD27
Land-surface elevation 1,774. feet above sea level NGVD29
The depth of the well is 189 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-36 (T 12N R 05W Section 23)



Seward County, Nebraska
Hydrologic Unit Code 10270201
Latitude 40°54'06", Longitude 97°11'50" NAD27
Land-surface elevation 1,550. feet above sea level NGVD29
The depth of the well is 123 feet below land surface.
This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure BB-37 (T 11N R 02E Section 21)

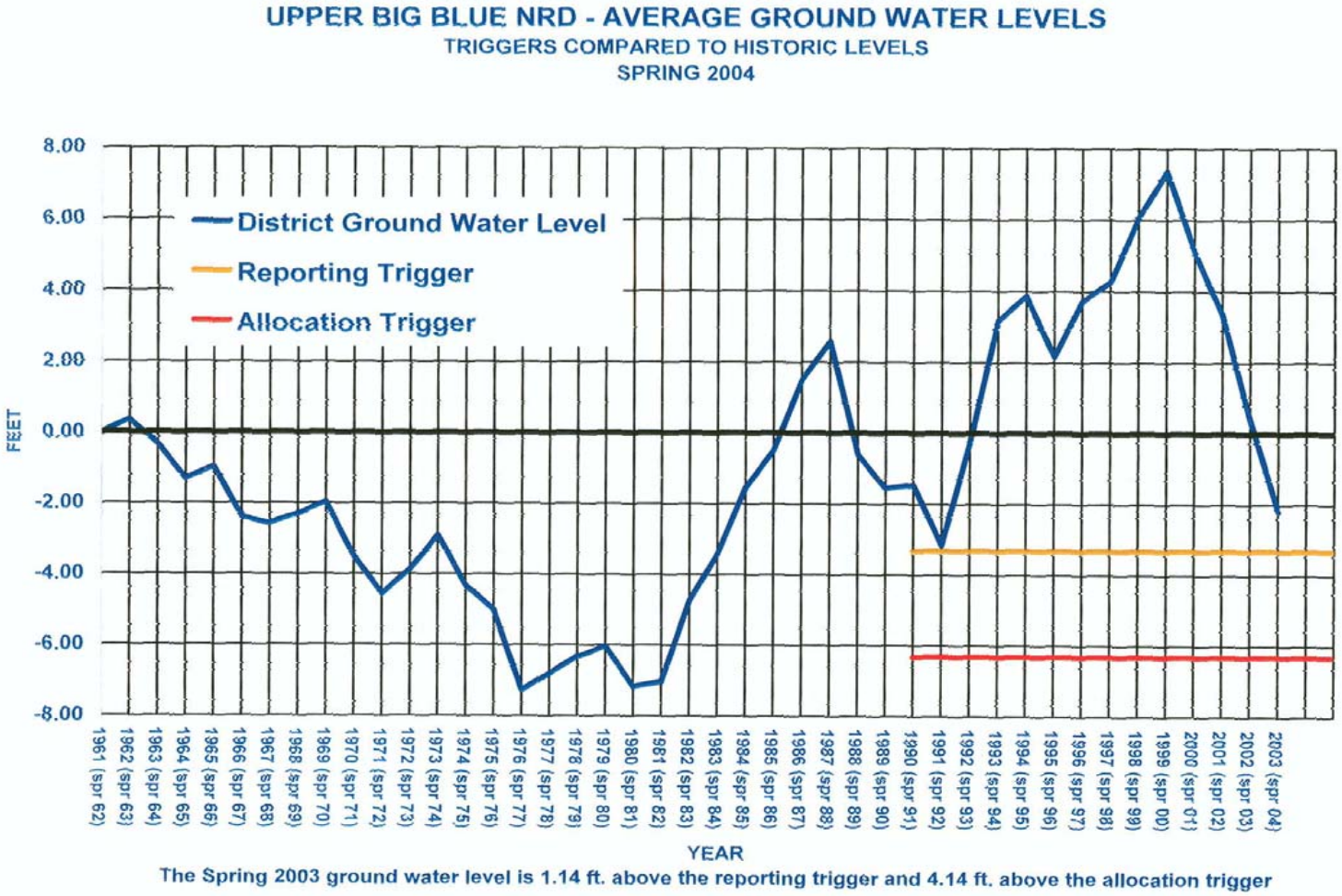

UPPER BIG BLUE NRD - AVERAGE GROUND WATER LEVELS
TRIGGERS COMPARED TO HISTORIC LEVELS
SPRING 2004
District Ground Water Level
Reporting Trigger
Allocation Trigger
FEET
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
-8.00
1961 (spr 62)
1962 (spr 63)
1963 (spr 64)
1964 (spr 65)
1965 (spr 66)
1966 (spr 67)
1967 (spr 68)
1968 (spr 69)
1969 (spr 70)
1970 (spr 71)
1971 (spr 72)
1972 (spr 73)
1973 (spr 74)
1974 (spr 75)
1975 (spr 76)
1976 (spr 77)
1977 (spr 78)
1978 (spr 79)
1979 (spr 80)
1980 (spr 81)
1981 (spr 82)
1982 (spr 83)
1983 (spr 84)
1984 (spr 85)
1985 (spr 86)
1986 (spr 87)
1987 (spr 88)
1988 (spr 89)
1989 (spr 90)
1990 (spr 91)
1991 (spr 92)
1992 (spr 93)
1993 (spr 94)
1994 (spr 95)
1995 (spr 96)
1996 (spr 97)
1997 (spr 98)
1998 (spr 99)
1999 (spr 00)
2000 (spr 01)
2001 (spr 02)
2002 (spr 03)
2003 (spr 04)
YEAR
The Spring 2003 ground water level is 1.14 ft. above the reporting trigger and 4.14 ft. above the allocation trigger

Figure BB-38

Figure BB-39. Annual Flows, Lincoln Creek near Seward.

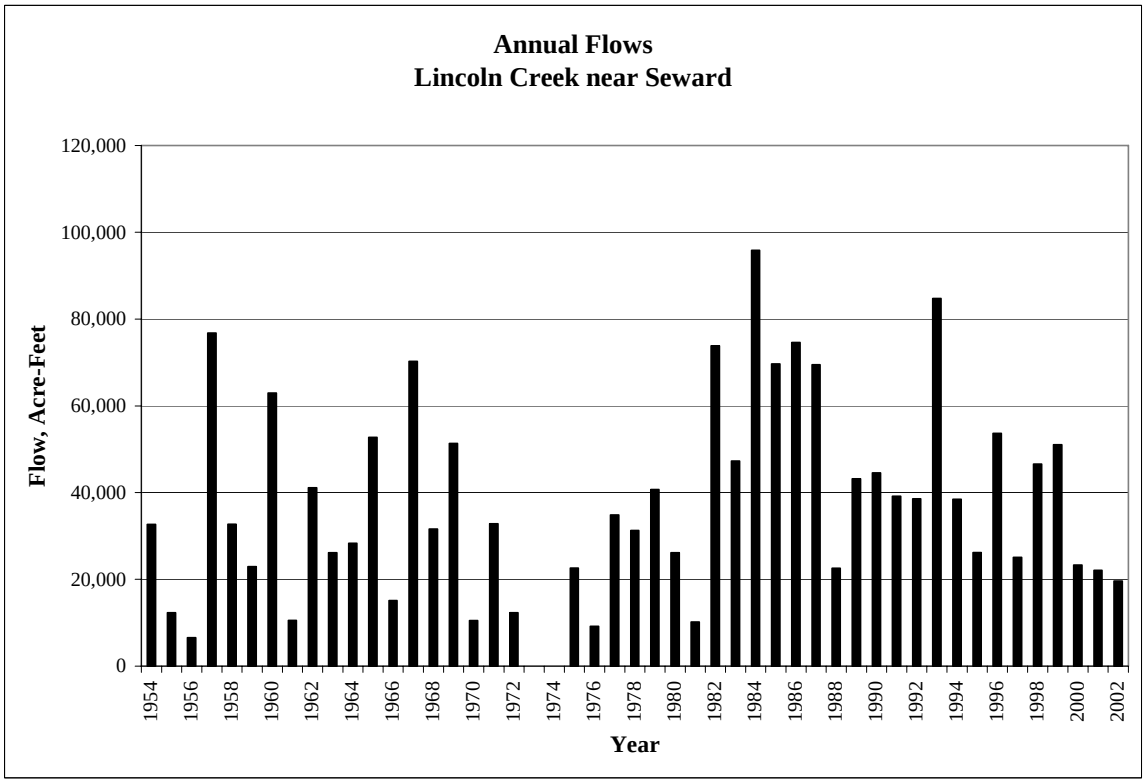


Figure BB-40. Annual Flows, West Fork of the Big Blue River near Dorchester.

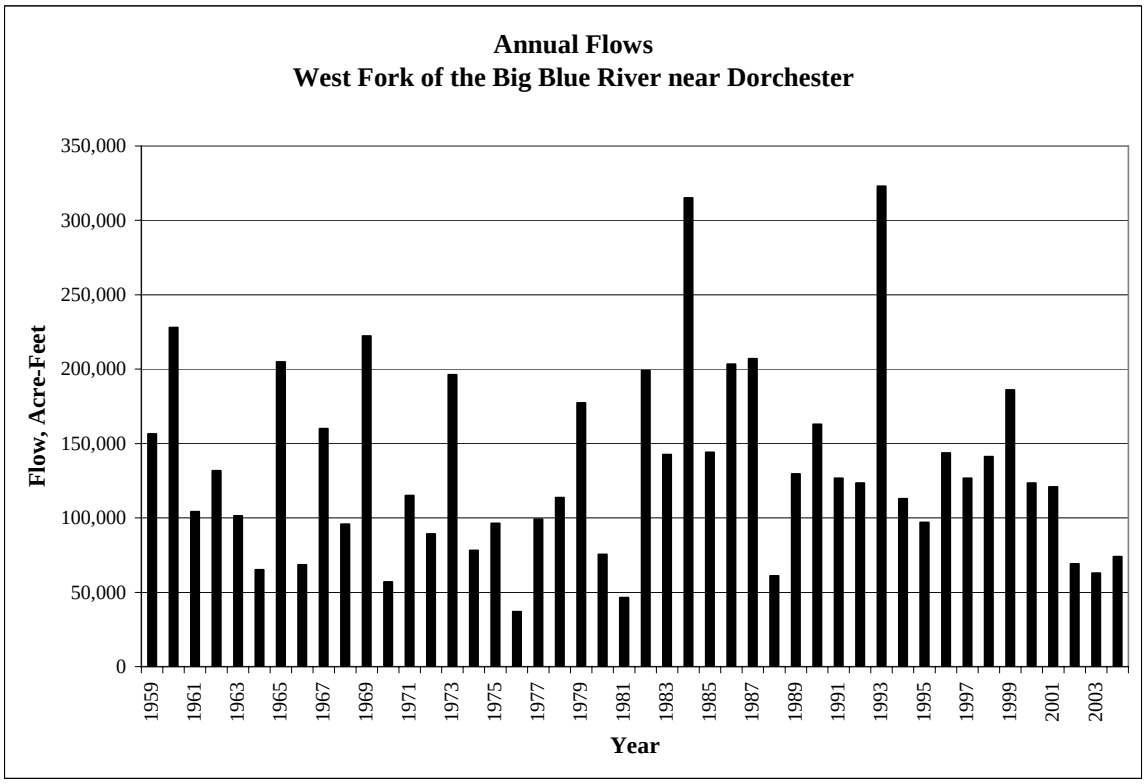


Figure BB-41. Annual Flows, Turkey Creek near Wilbur.

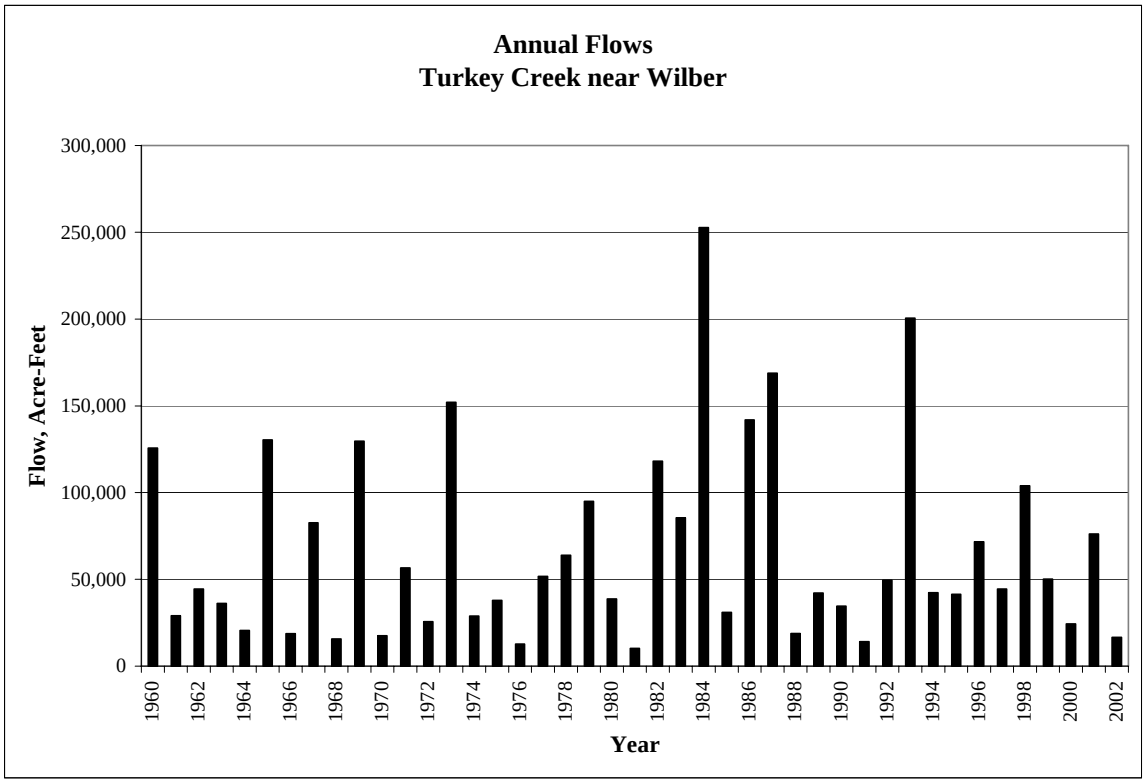


Figure BB-42. Annual Flows, Big Blue River at Surprise.

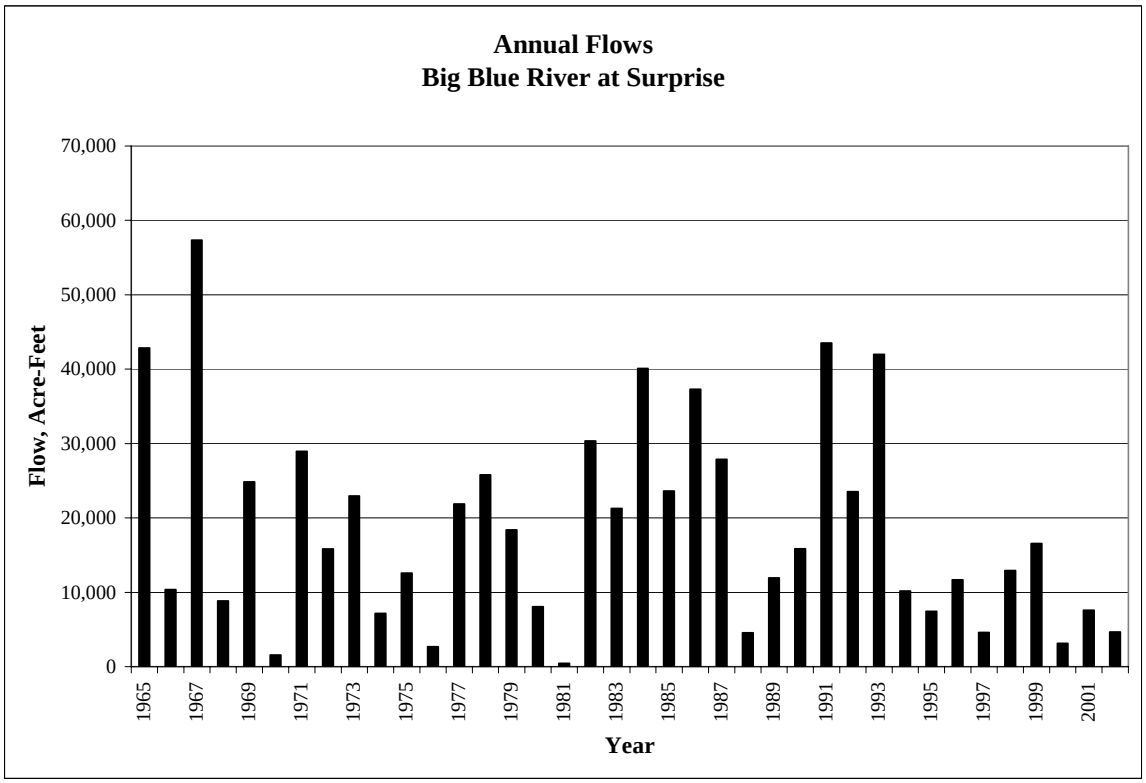


Figure BB-43. Annual Flows, Big Blue River near Seward.

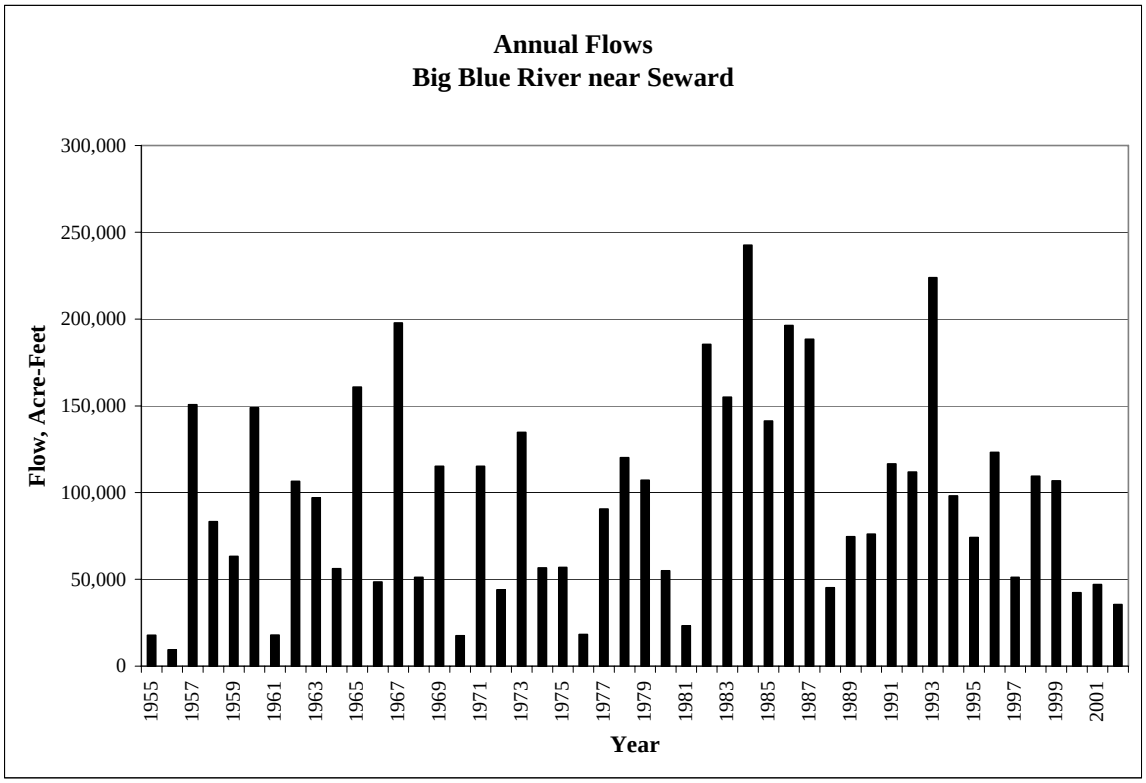


Figure BB-44. Annual Flows, Big Blue River near Crete.

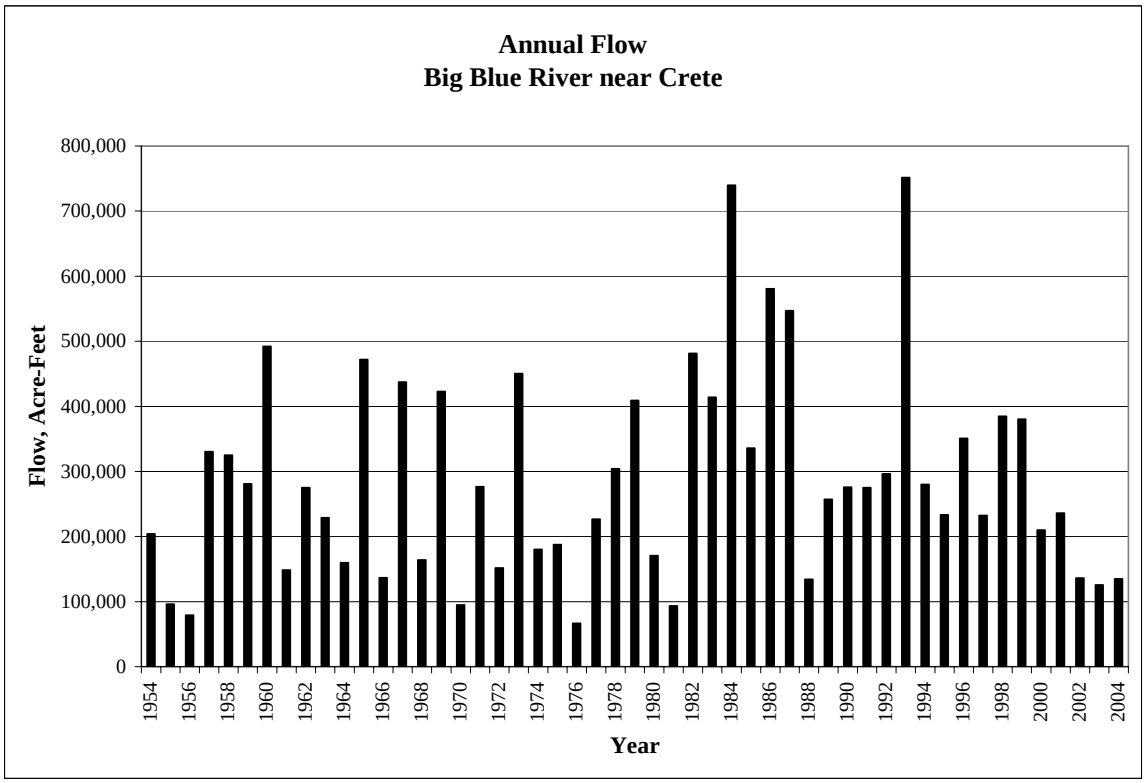


Figure BB-45. Annual Flows, Big Blue River at Beatrice.

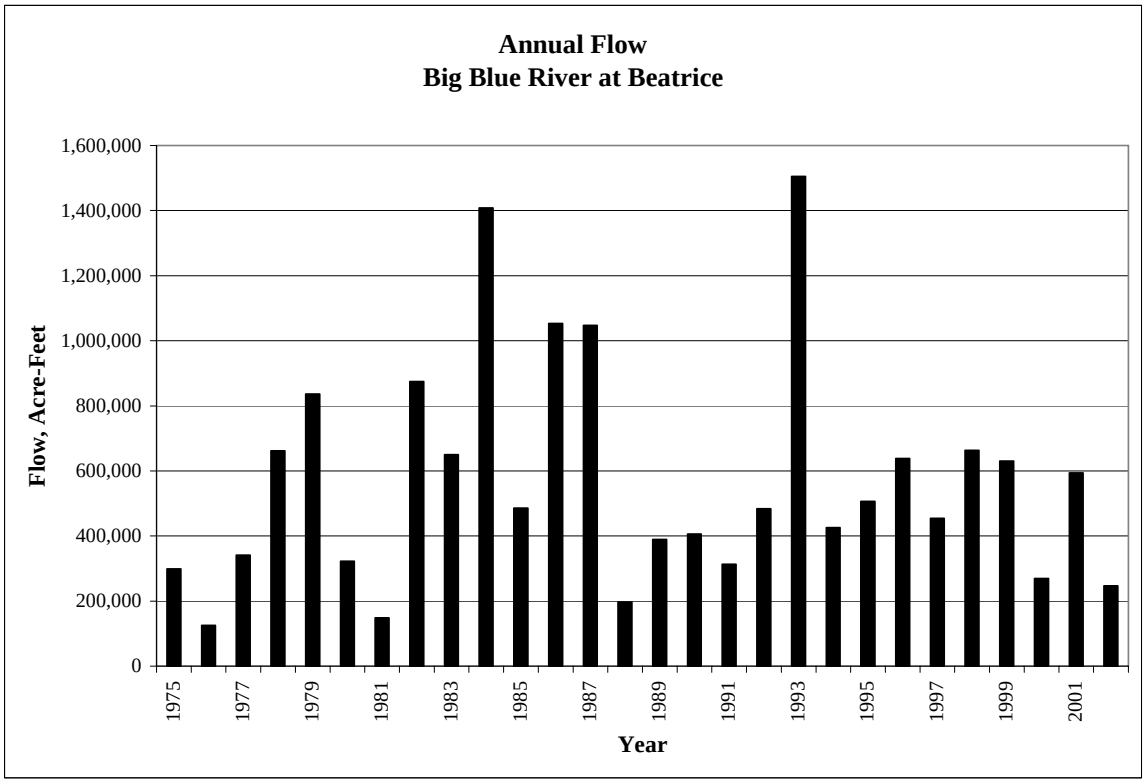
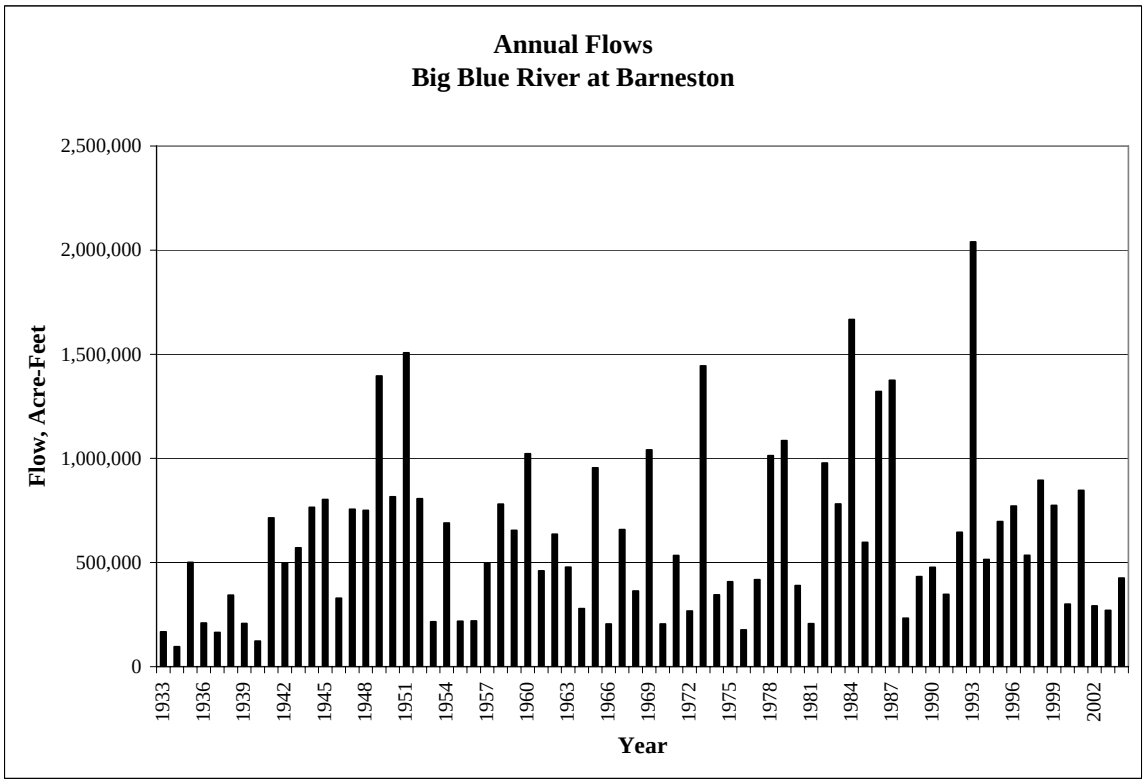
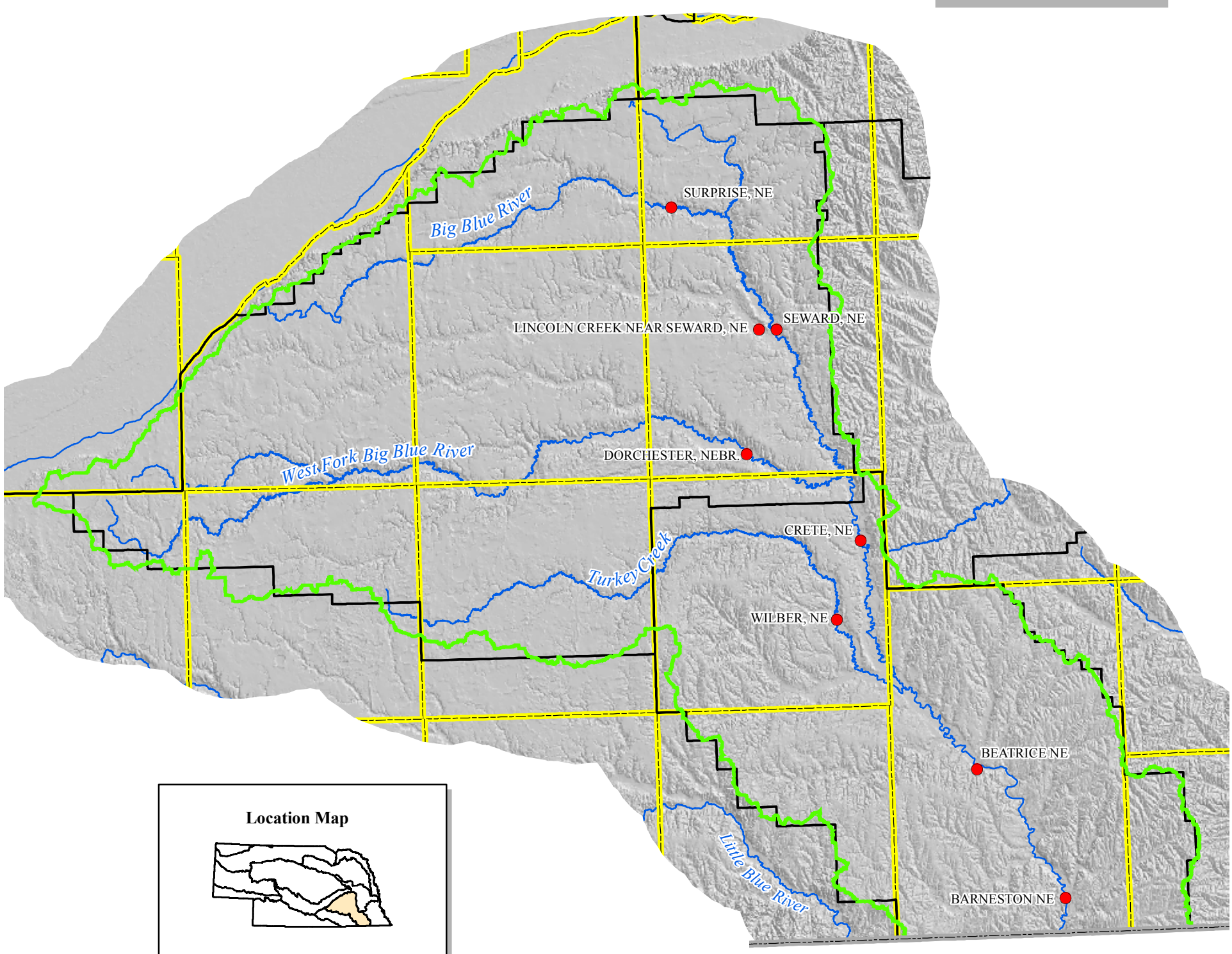


Figure BB-46. Annual Flows, Big Blue River at Barneston.



Stream Gages
BIG BLUE RIVER BASIN

Planning and Assistance Division



This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.

0 4 8 16 24 32 Miles

Figure BB-47.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Stream gages map produced by Jeff Shafer, October 18, 2005.

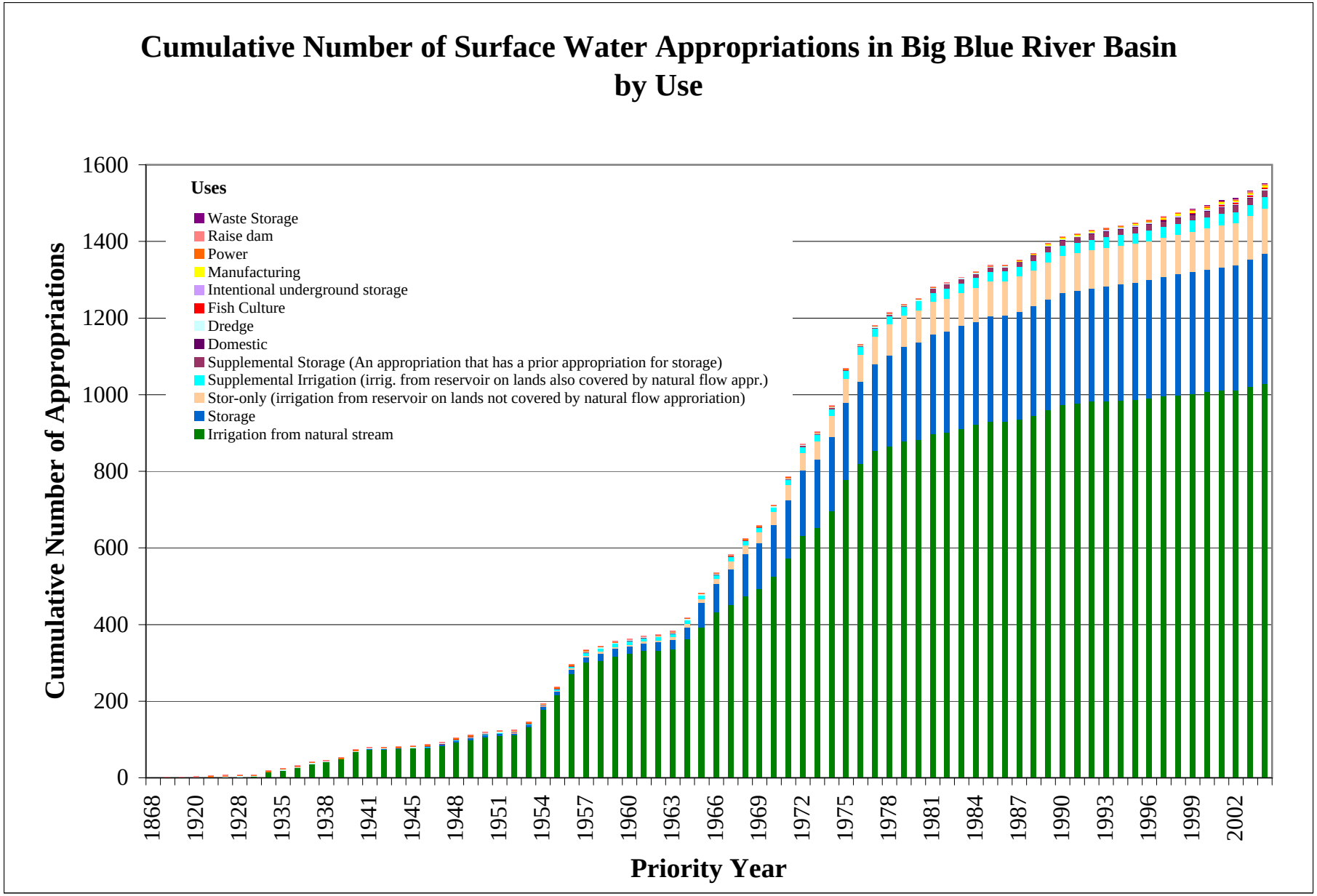


Figure BB-48

11/23/2005 by Shuhai Zheng

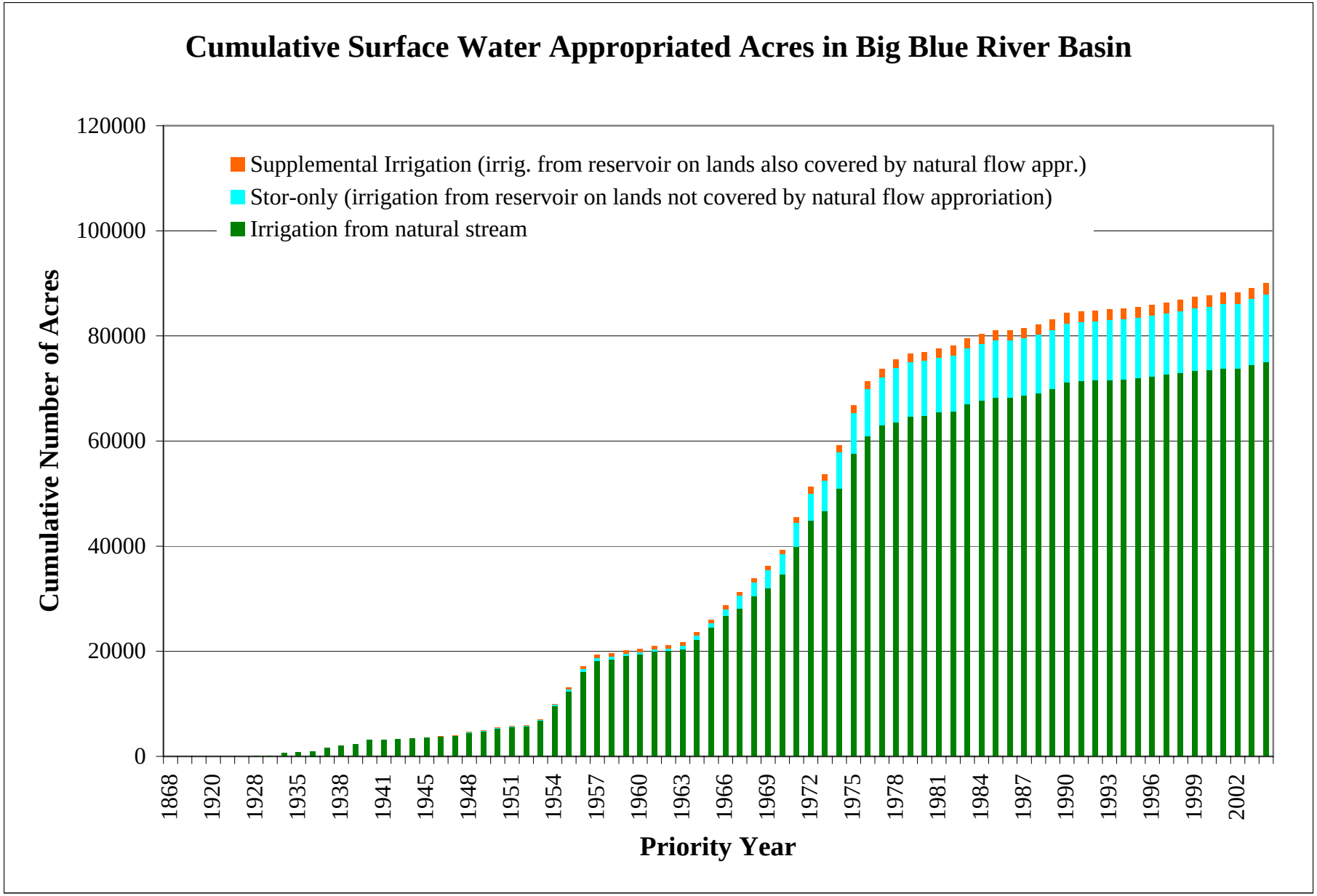
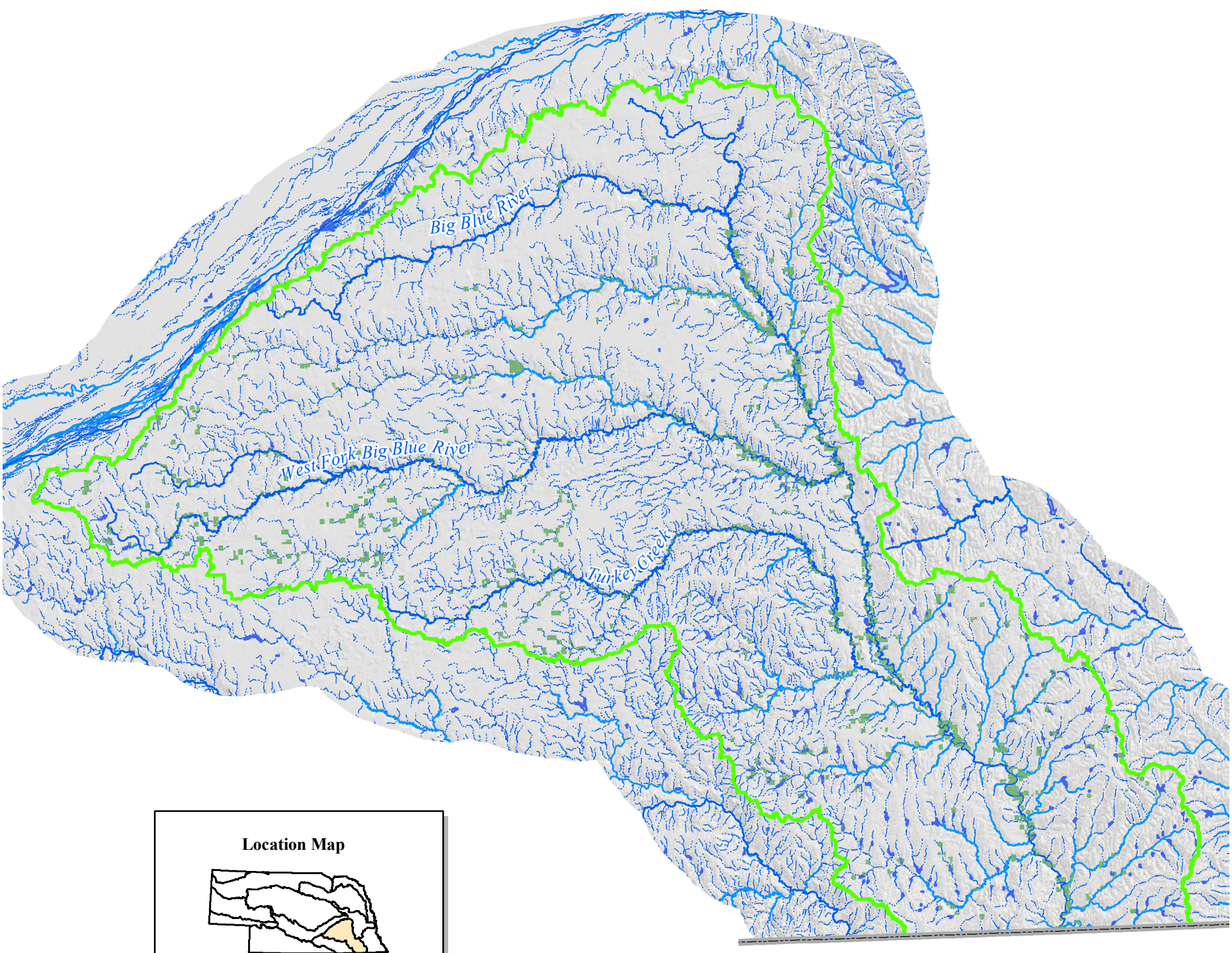


Figure BB-49

11/23/2005 by Shuhai Zheng

Surface Water Irrigation Locations
BIG BLUE RIVER BASIN

Planning and Assistance Division



This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.

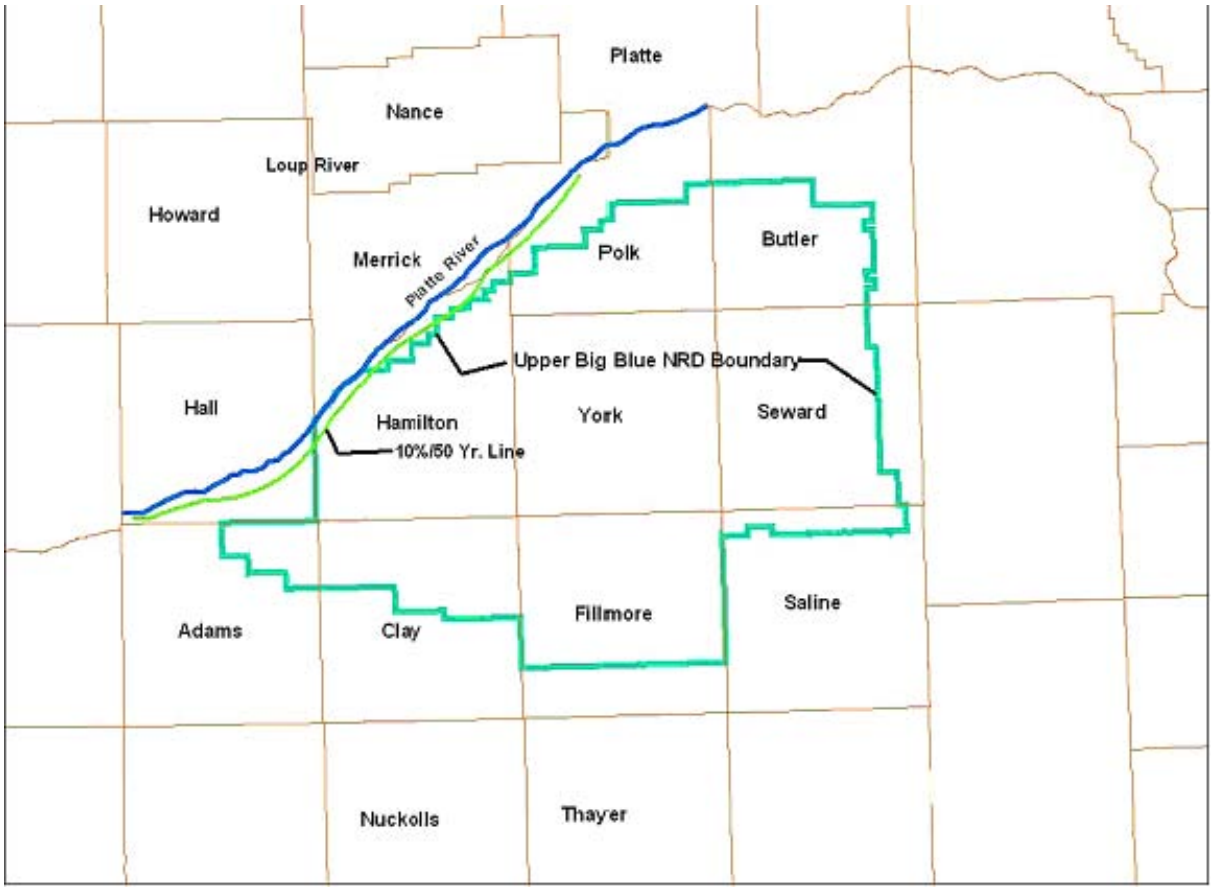
Surface water irrigation location information digitized by DNR staff from surface water irrigation application maps.

0 4 8 16 24 32 Miles

Figure BB-50.

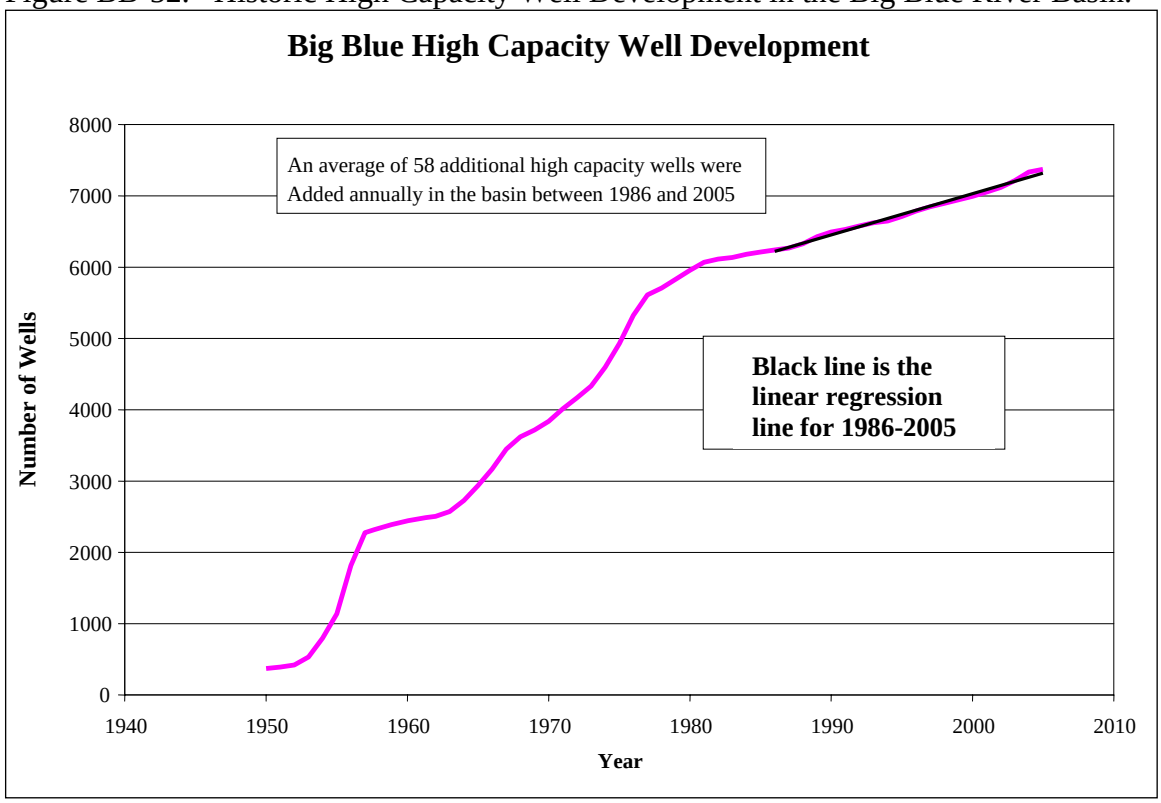
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Surface water irrigation locations map produced by Jeff Shafer, October 6, 2005

Figure BB-51. Hydrologically Connected Area to the Platte River in the Upper Big Blue NRD



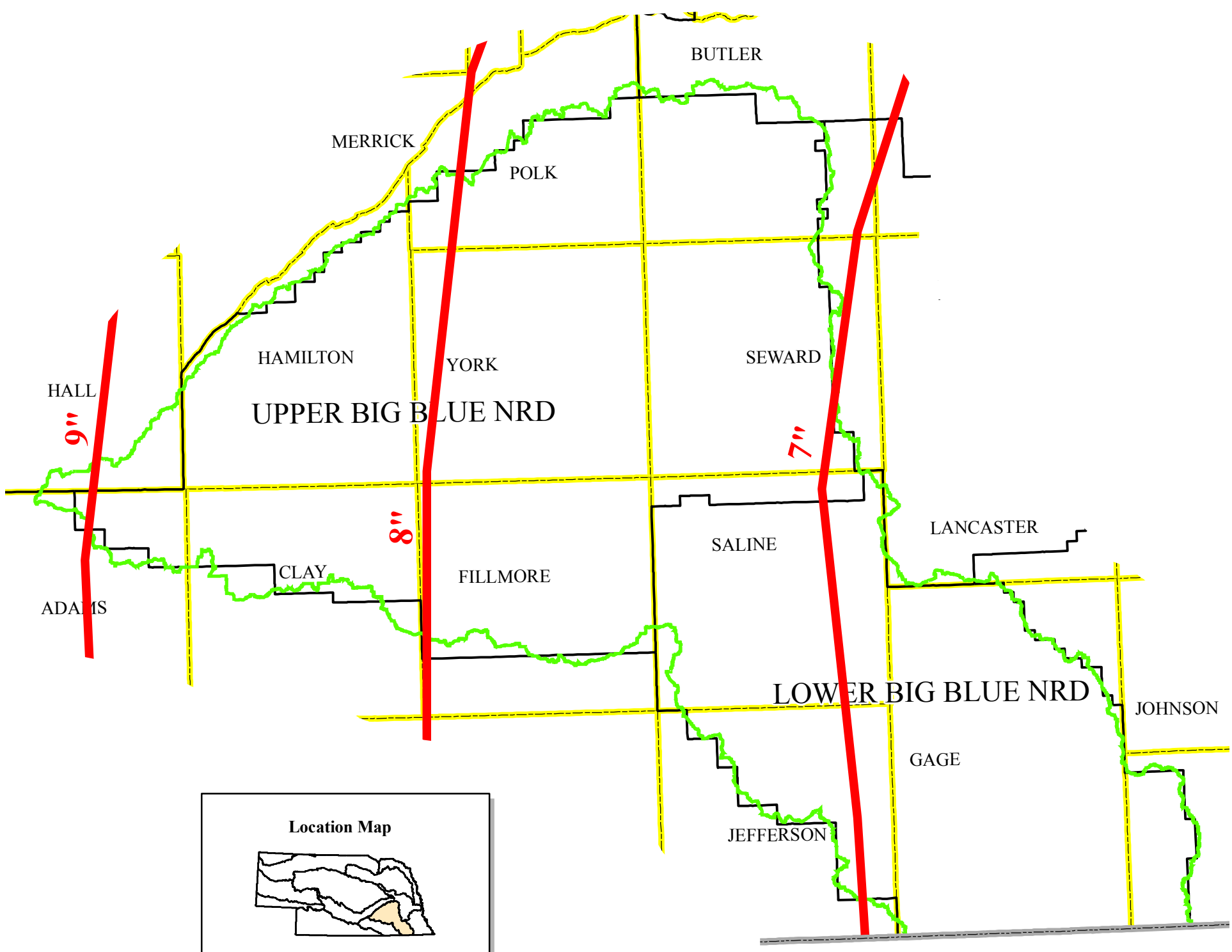
Bitner, J. UBBNRD, 20005

Figure BB-52. Historic High Capacity Well Development in the Big Blue River Basin.



Corn Crop Irrigation Requirement
BIG BLUE RIVER BASIN

Planning and Assistance Division



This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.

0 4 8 16 24 32 Miles

Figure BB-53.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Corn crop irrigation requirement map produced by Kevin J. Schwartman, December 7, 2005

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