Upper Elkhorn
Natural Resources District
301 North Harrison
O'Neill, NE 68763
402-336-3867
www.uenrd.org

Water FundingTaskForce (LB517)
November 7-8 , Norfolk NE

Upper Elkhorn
Natural Resources District

301 North Harrison Street
O'Neill, NE 68763
402-336-3867
fax 402-336-1832

Basic Information

Consists of Four Counties:

(99% of) Antelope, (60% of) Holt, (60% of) Rock, & (25% of) Wheeler

Total Acres Within District: 1,953,280

2010 Census: 17,935

City/Village Pop: 10,835 (48 residents to 3,705) Rural Pop: 7,100

2013-14 Budget:

Total Budget - $3,023,496; Tax Asking: $712,400 ; Mill-Levy of 2.27

2.5% General Lid generates $15,900

NRD is Currently Certifying GW Irrigated Acres & Irrigation Wells:

Estimate 450,000 to 500,000 of gw irrigated acres and > 4,200 Irrigation wells (Goal is to have this completed within the next 1.5 years)

Surface Water:

There are no Surface Water Irrigation Districts, however we do have approximately 6,000 acres that have an active DNR surface water appropriation right. Are they being used?

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UENRD Board of Director's Representation

Upper Elkhorn NRD Directors, 15 board members, elected by sub-district at large:
(Sub-District Ratio: 1.97 to 1)

Sub-District I (Rock Co.)
Roy Stewart
Jim Keller

Sub-District II (Western Holt Co.)
Curtis Gotschall
James Dvorak

Sub-District III (City of O'Neill)
Gene Kelley
Dale Wiles

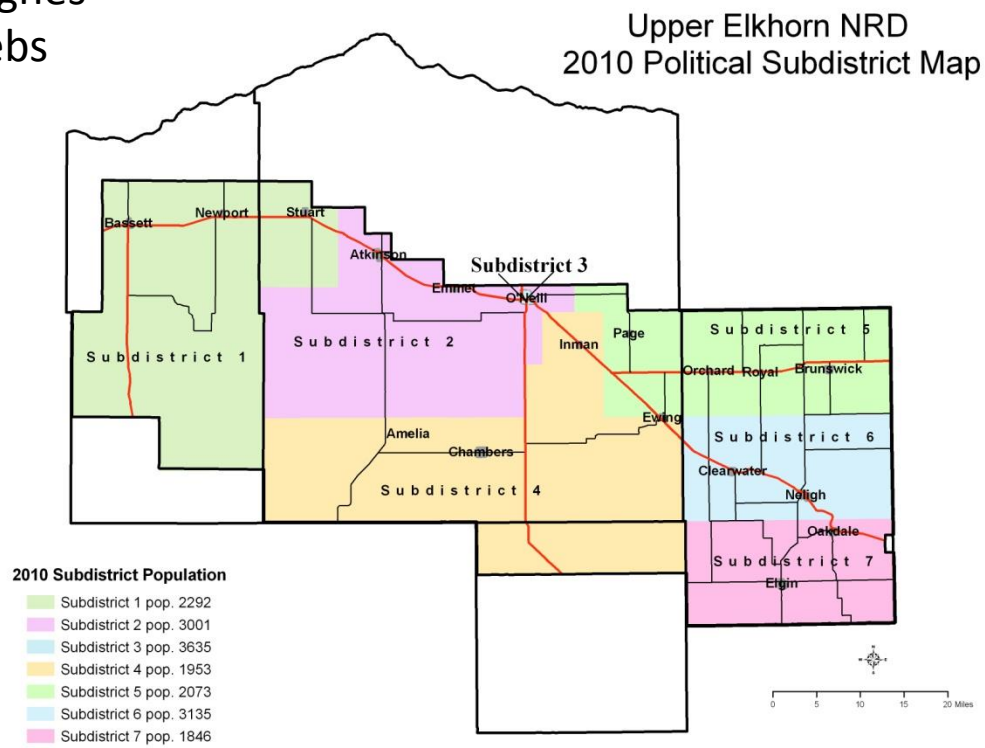
Sub-District IV (Southern Holt, Wheeler Co.)
Mike Russman
Jerry Childers

Sub-District V (North Antelope Co.)
Mark Carpenter
Vacancy (Appt. in November)

Sub-District VI (Central Antelope)
Ted Hughes
Jeff Krebs

Sub-District VII (Southern Antelope Co.)
Jerry Heithoff
Scott Beckman

At-large
Christopher Dierks



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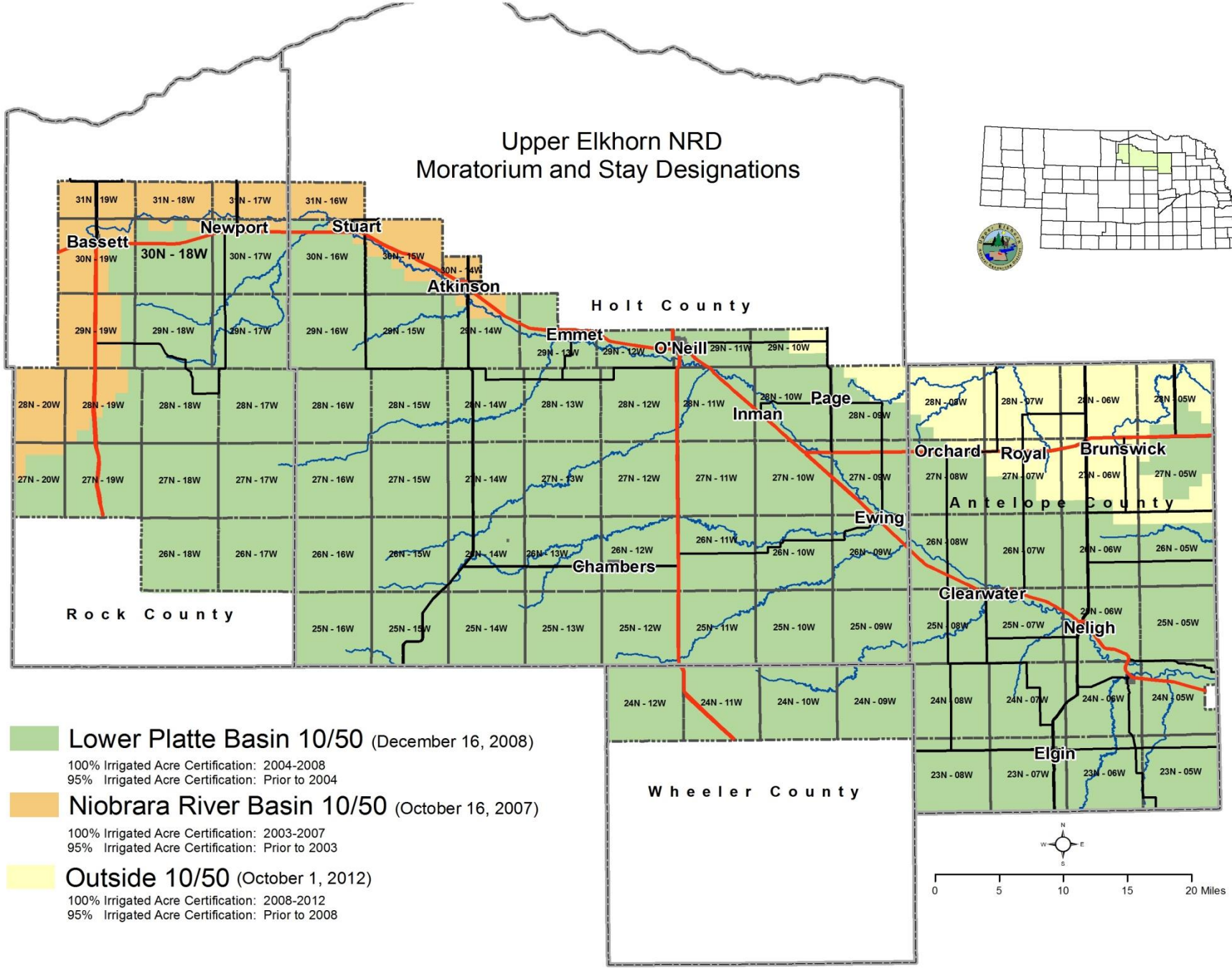
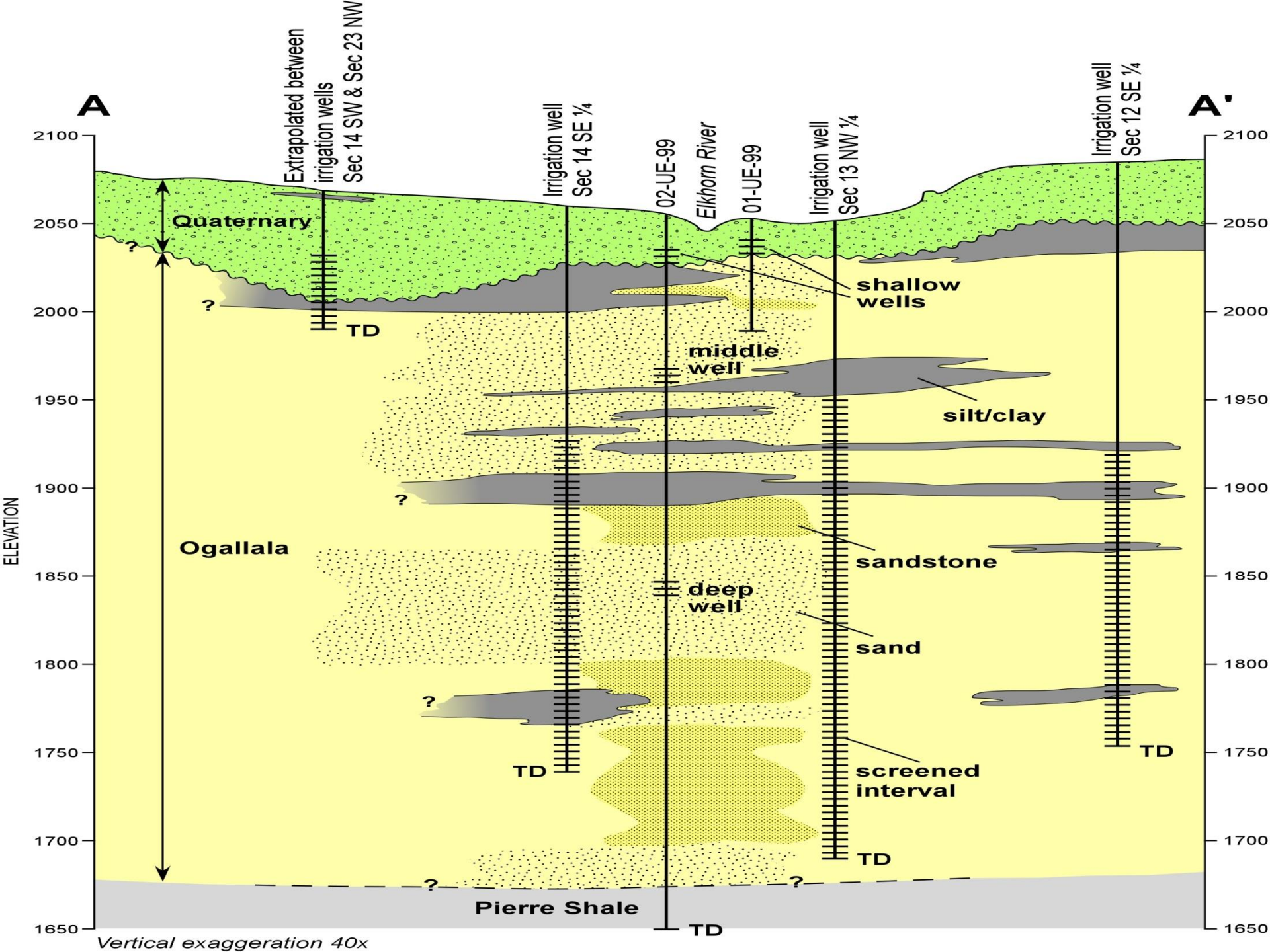
UENRD Hydrological Connected Areas Niobrara, Platte & Missouri

NDNR Preliminary Determination will be made sometime in December-2013 if Lower Platte River Basin will be labeled Fully or Non-Fully Appropriated. This is the start of sustainability/balance between surface & ground water uses in the basin.

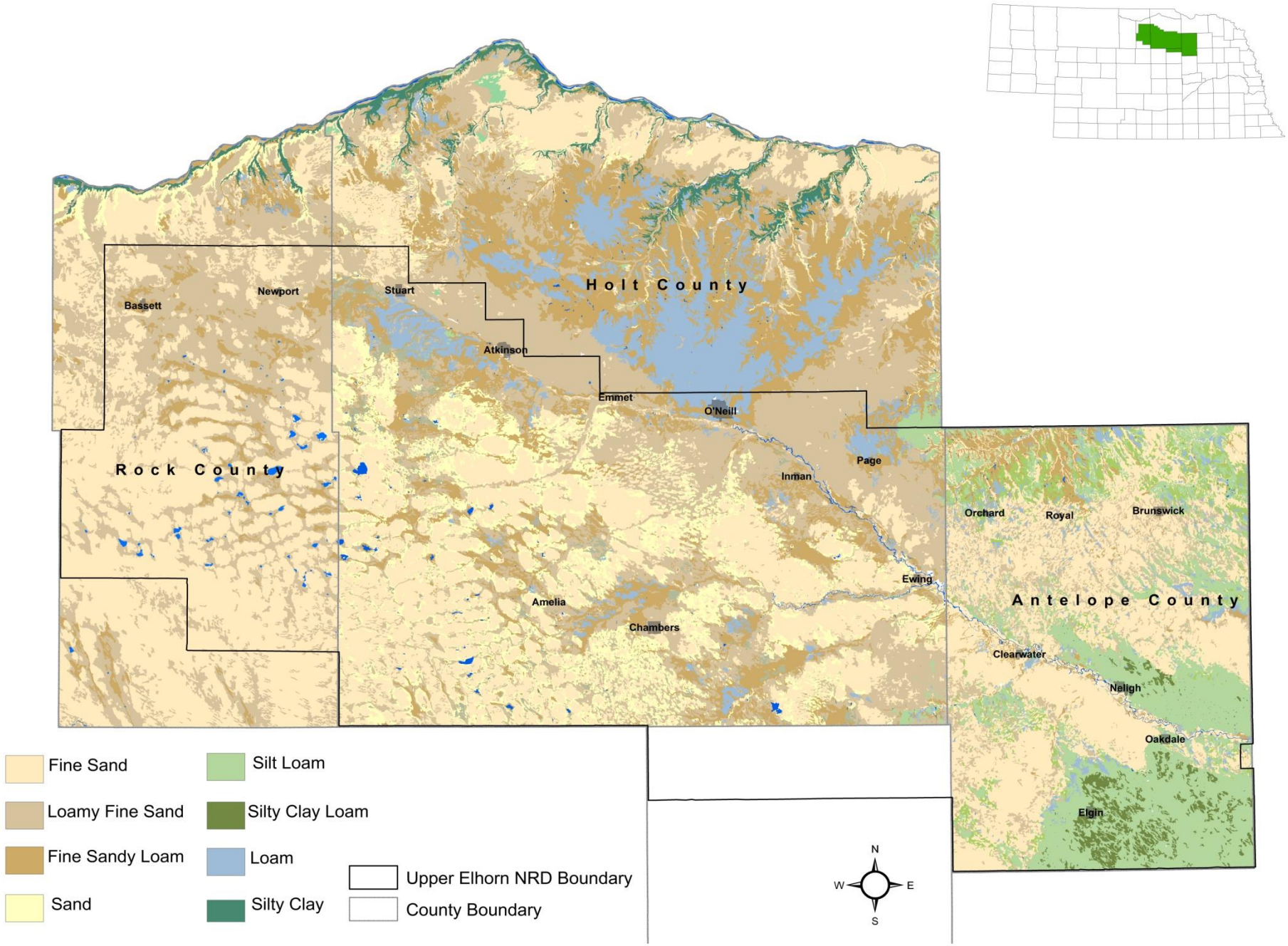
Upper Elkhorn NRD
Moratorium and Stay Designations



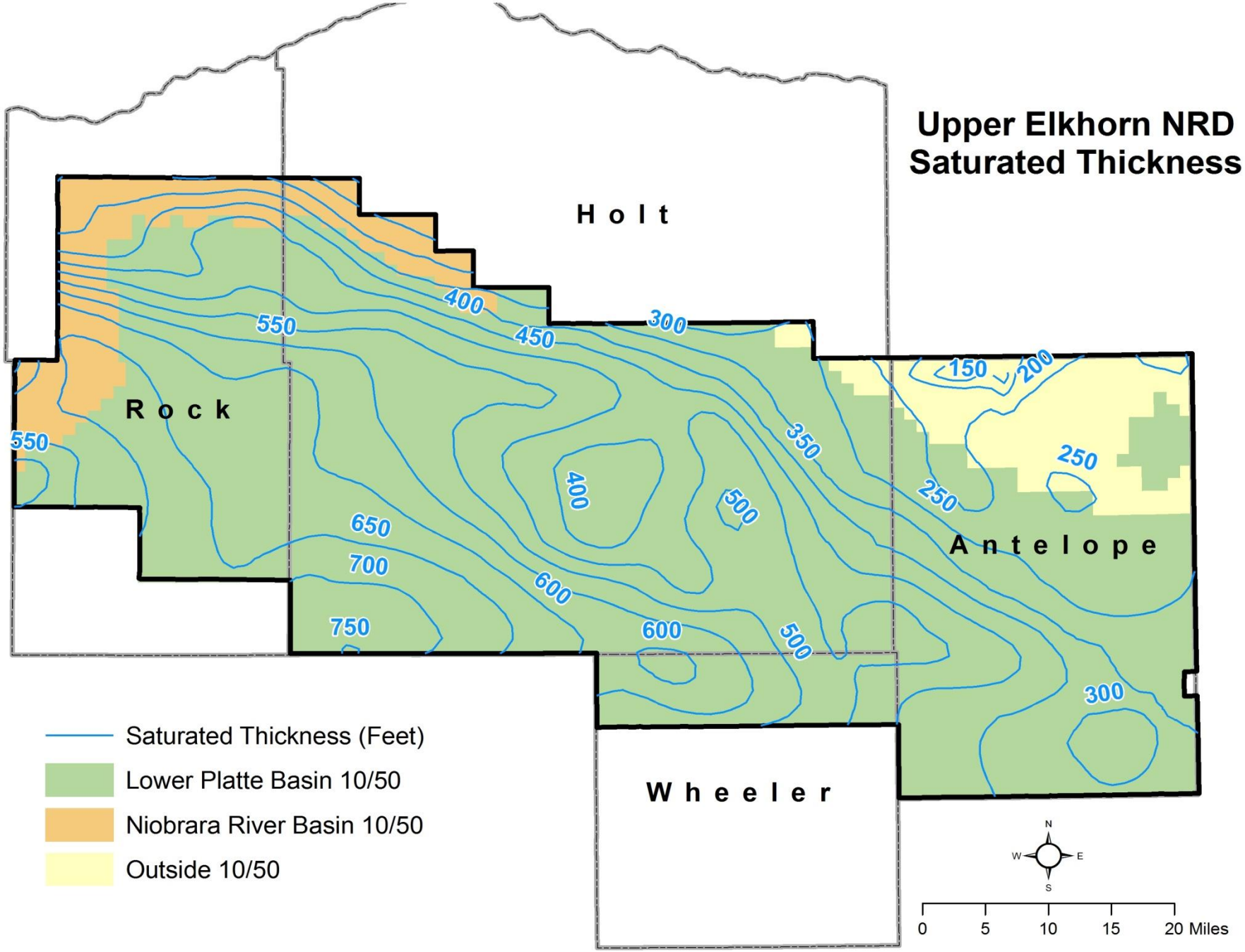
UENRD Geology and Soils

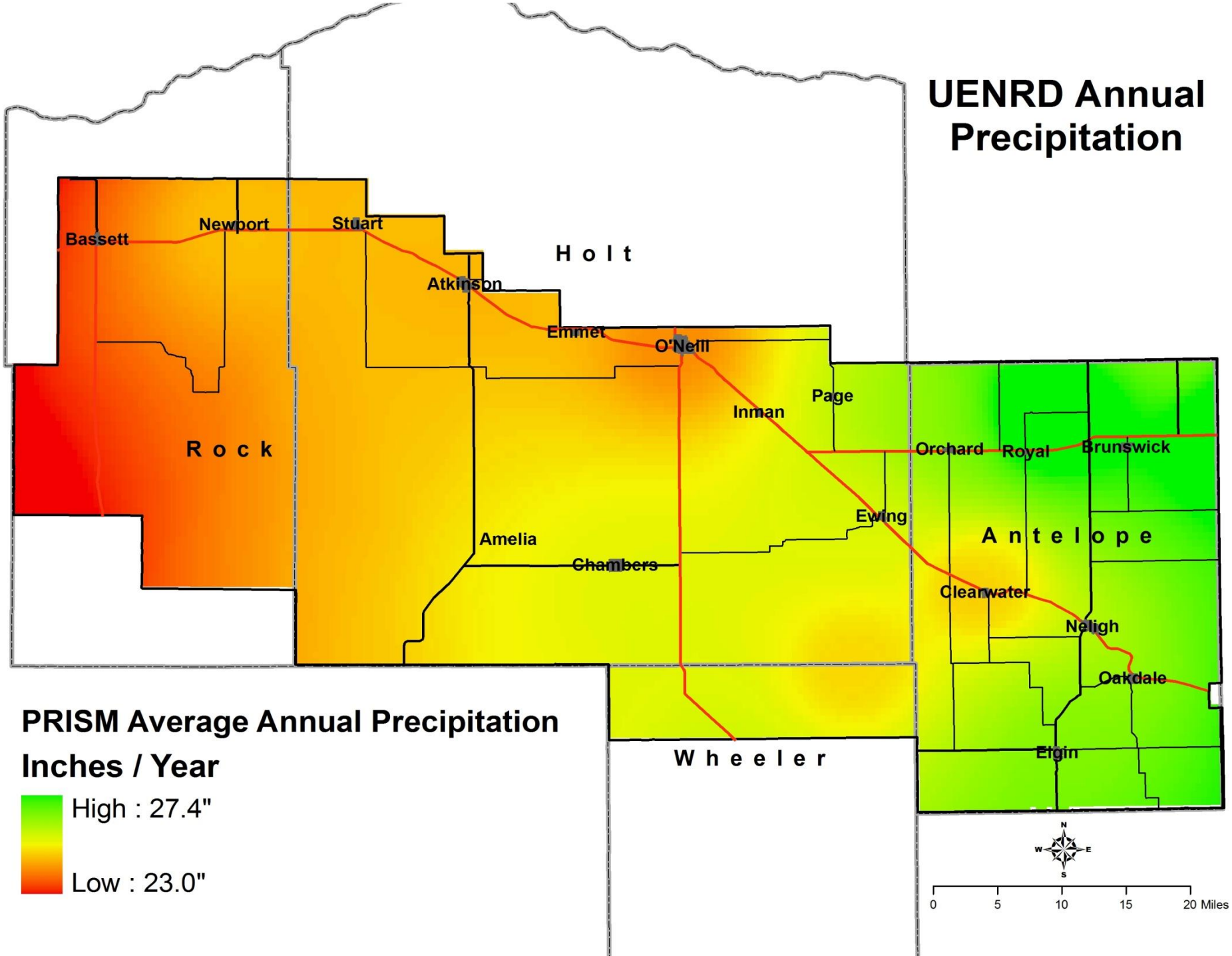

A
A'
Extrapolated between irrigation wells Sec 14 SW & Sec 23 NW
Irrigation well Sec 14 SE ¼
02-UE-99
Elkhorn River
01-UE-99
Irrigation well Sec 13 NW ¼
Irrigation well Sec 12 SE ¼
Quaternary
shallow wells
middle well
silt/clay
Ogallala
sandstone
deep well
sand
screened interval
Pierre Shale
TD
ELEVATION
2100
2050
2000
1950
1900
1850
1800
1750
1700
1650
Vertical exaggeration 40x

Upper Elkhorn NRD and Surrounding Area Surface Soil Texture

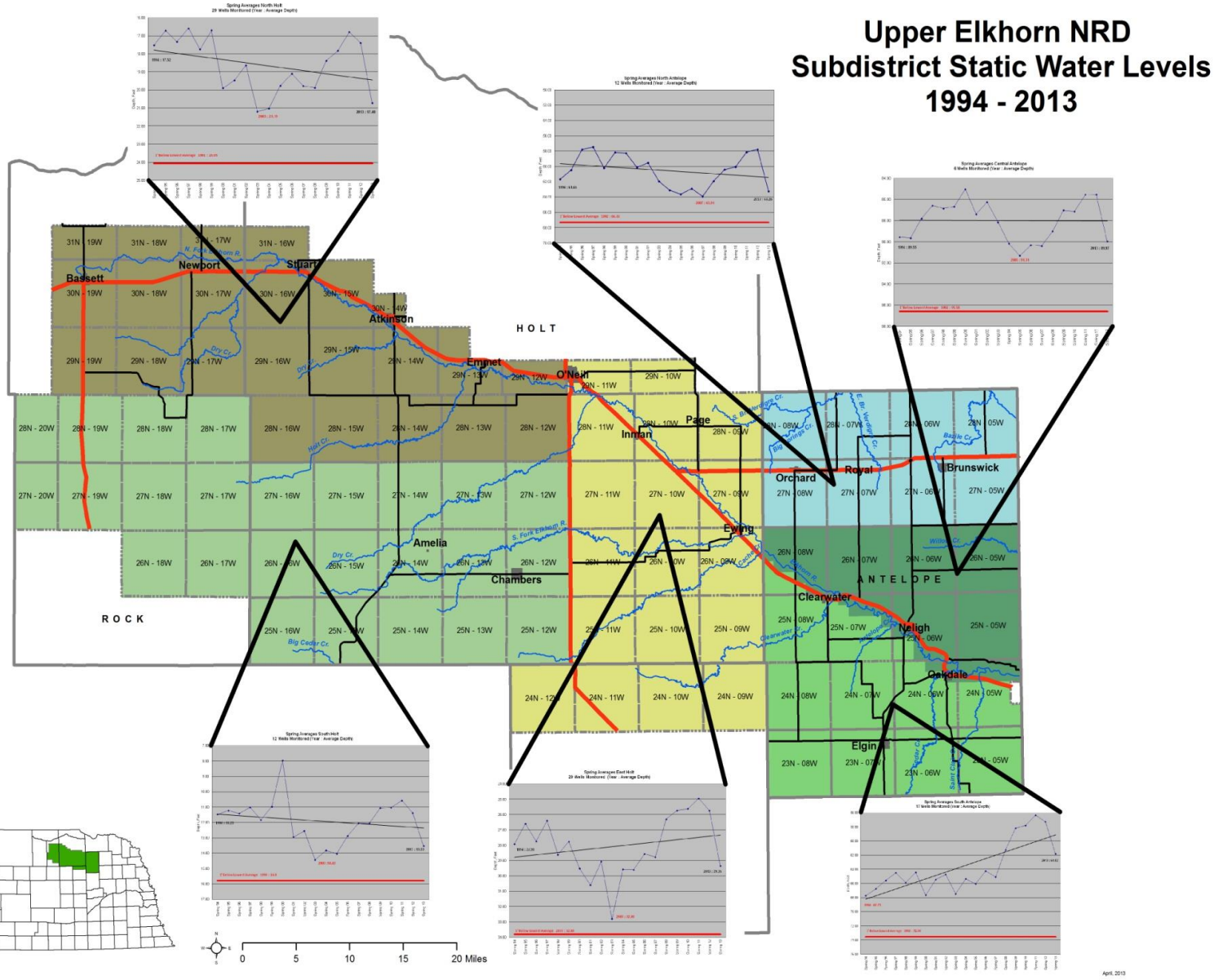


UENRD Water Quantity and Quality


Upper Elkhorn NRD
Saturated Thickness
Holt
Rock
Antelope
Wheeler
550
550
400
450
300
150
200
350
250
250
400
500
650
700
600
750
600
500
300
Saturated Thickness (Feet)
Lower Platte Basin 10/50
Niobrara River Basin 10/50
Outside 10/50
N
W
E
S
0
5
10
15
20 Miles


UENRD Annual Precipitation
Bassett
Newport
Stuart
Holt
Atkinson
Emmet
O'Neill
Page
Inman
Rock
Orchard
Royal
Brunswick
Ewing
Amelia
Antelope
Chambers
Clearwater
Neligh
Oakdale
Elgin
Wheeler
PRISM Average Annual Precipitation
Inches / Year
High : 27.4"
Low : 23.0"
N
W
E
S
0
5
10
15
20 Miles

Static Water Level Sites: 55 Dedicated & 107 Irrigation Wells



Elkhorn Loup Model-ELM (2007)

Partners: 8 NRDs, DNR, USGS & CSD

Funding: $2,420,258 (To Date)

IWMPP - $1,773,954, Participating NRDs $483,664 & Other: $162,640

Report to be Completed in June 2014

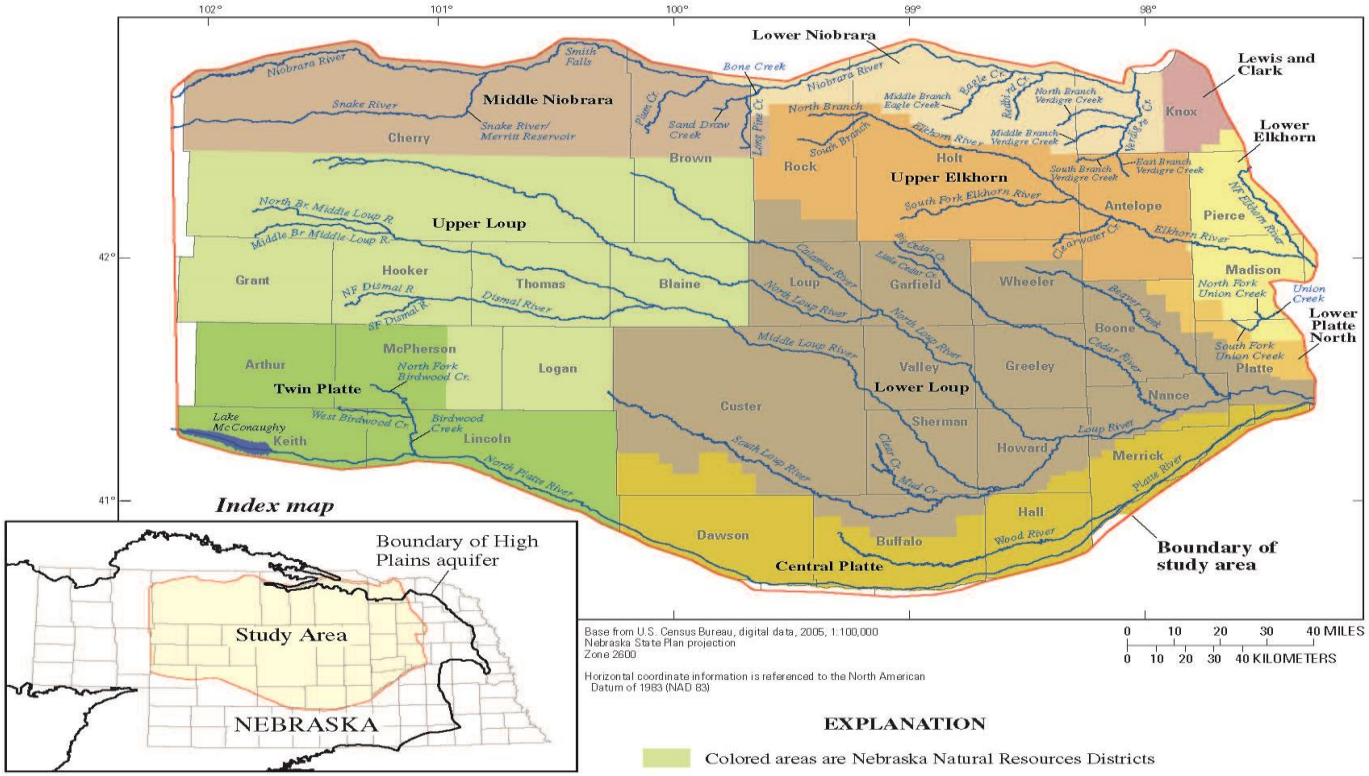
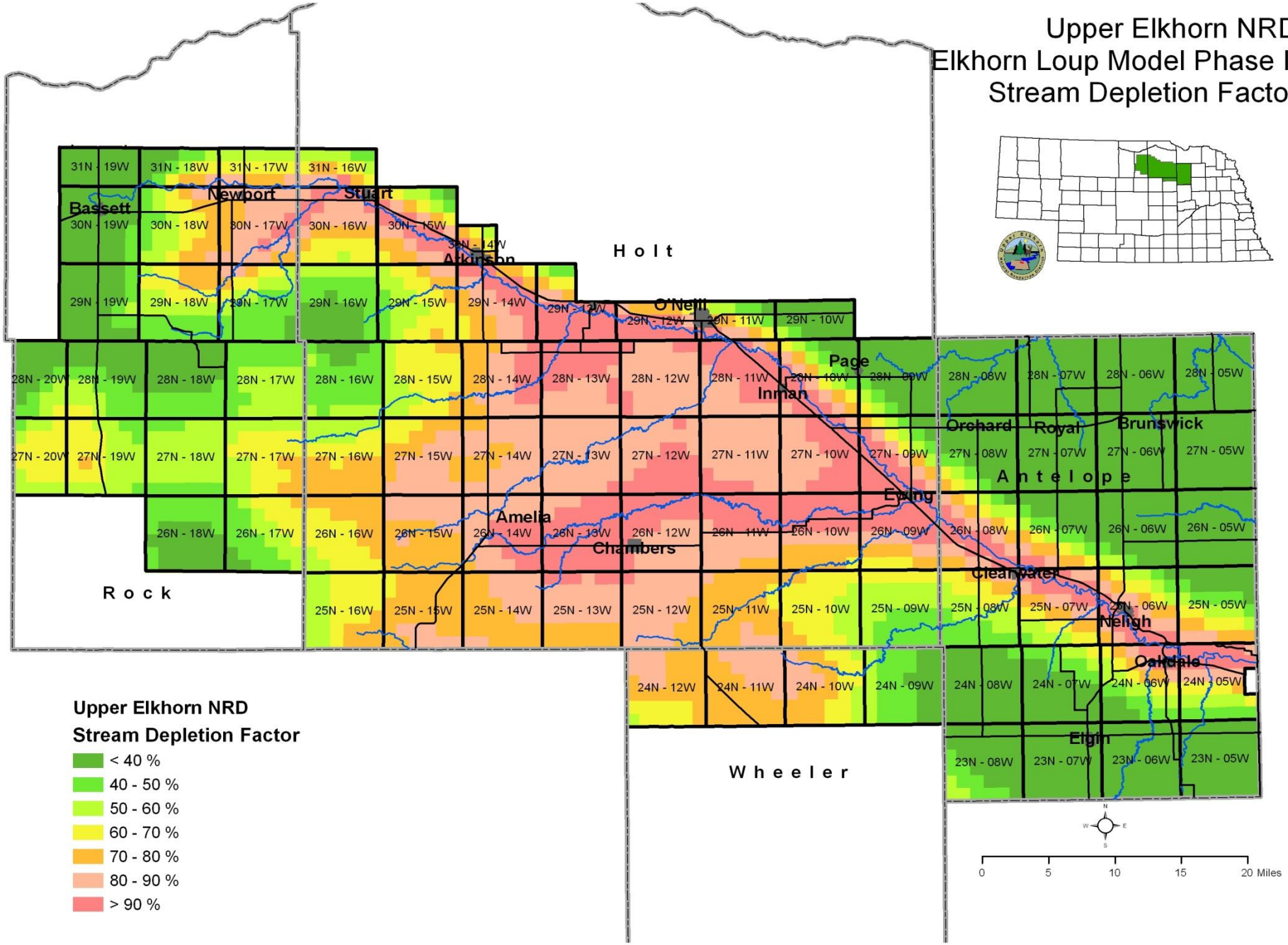
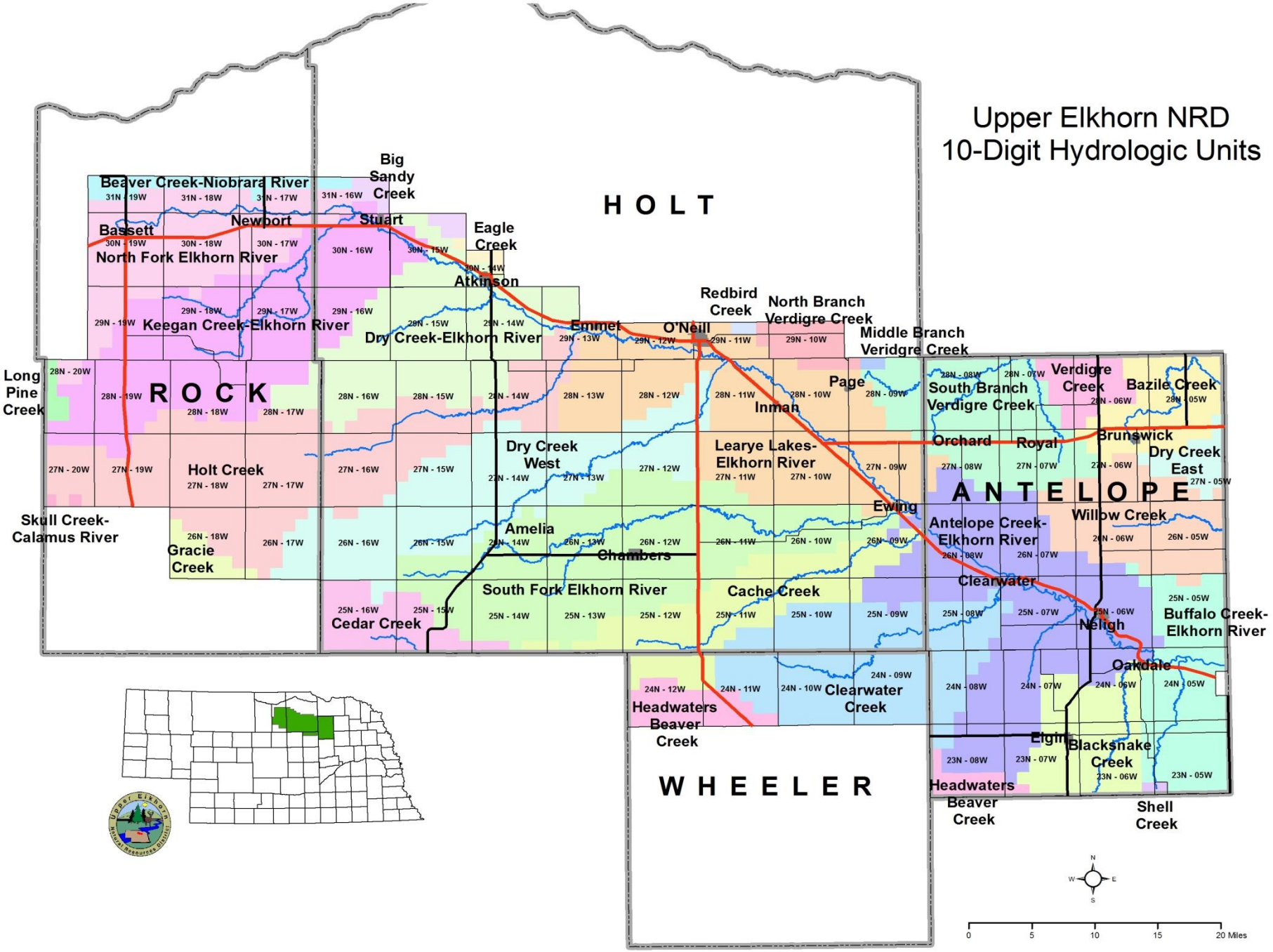


fig01.ai

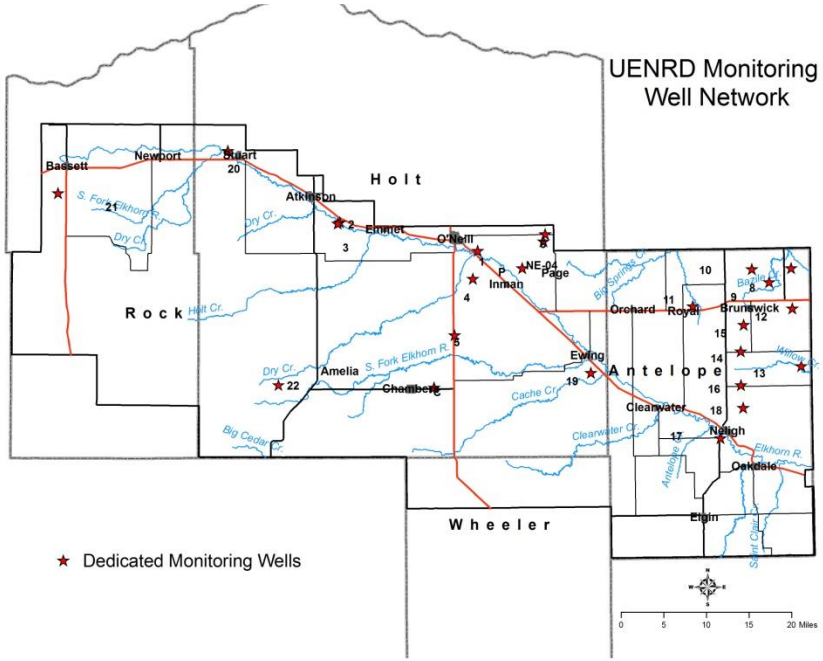
Upper Elkhorn NRD
Elkhorn Loup Model Phase II
Stream Depletion Factor

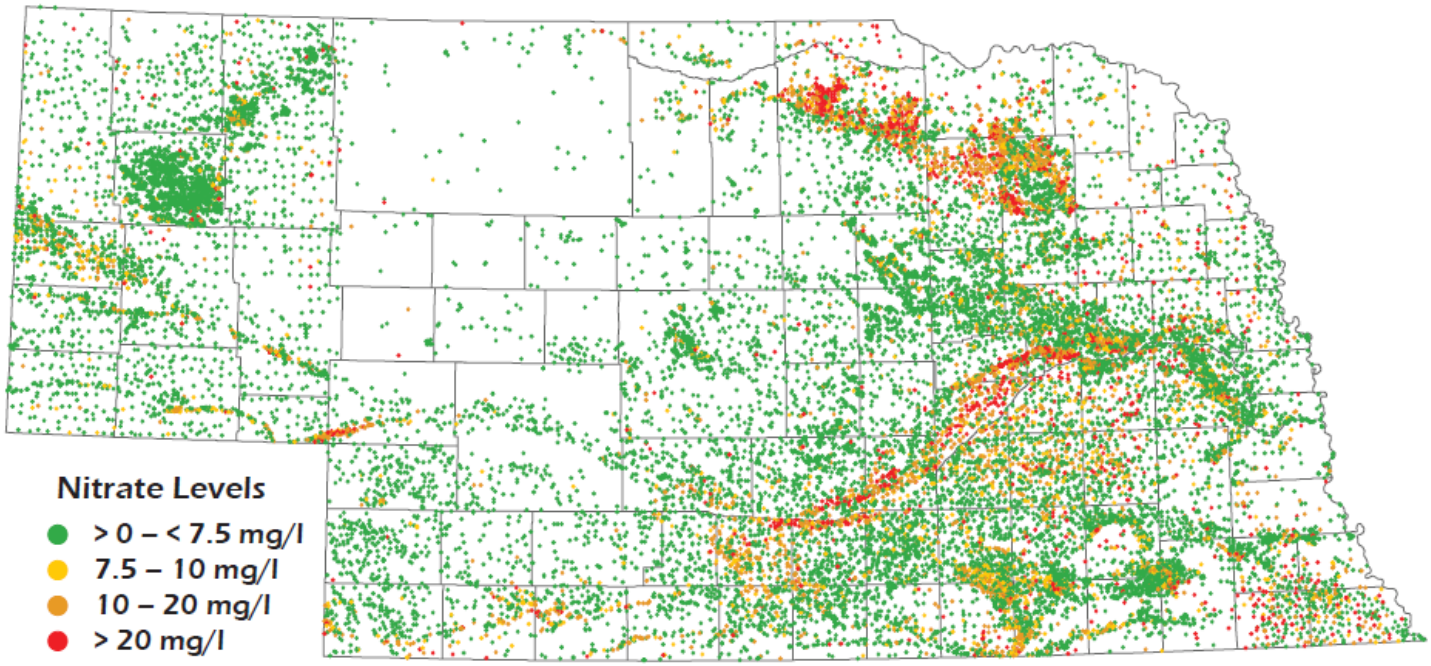


Upper Elkhorn NRD
10-Digit Hydrologic Units



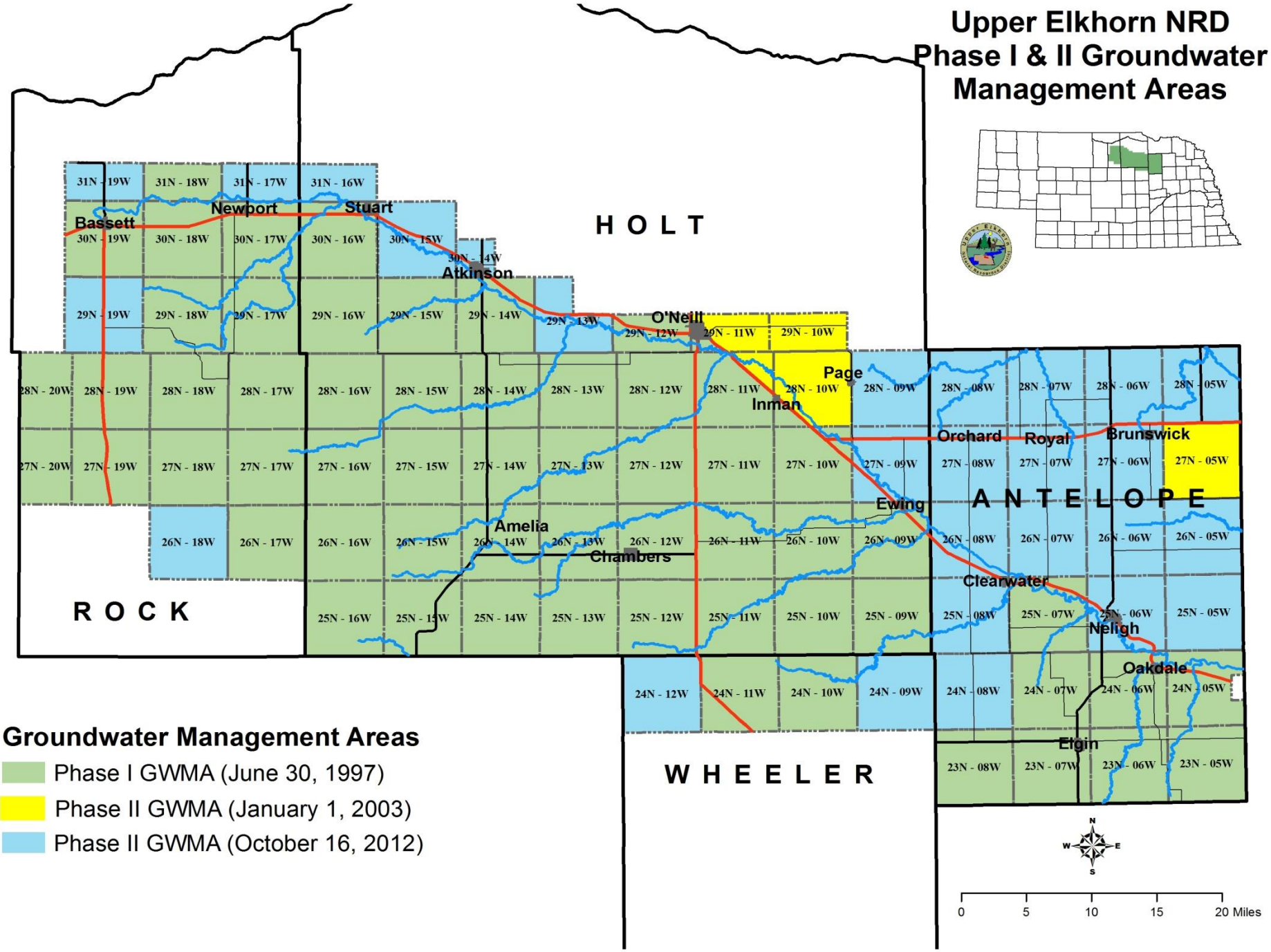
Water Quality Monitoring
650 Irrigation Wells & 55 Dedicated Monitoring Wells





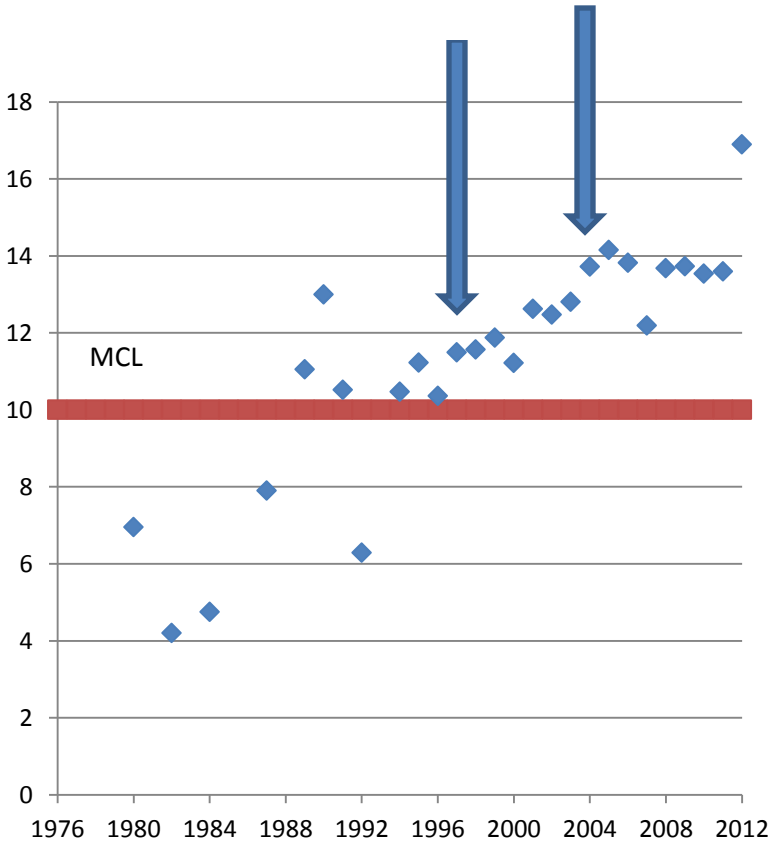
Last recorded concentration of nitrate from 1974 - 2010. (Source: Quality-Assessed Agrichemical Database for Nebraska Groundwater, 2011)

Upper Elkhorn NRD Phase I & II Groundwater Management Areas

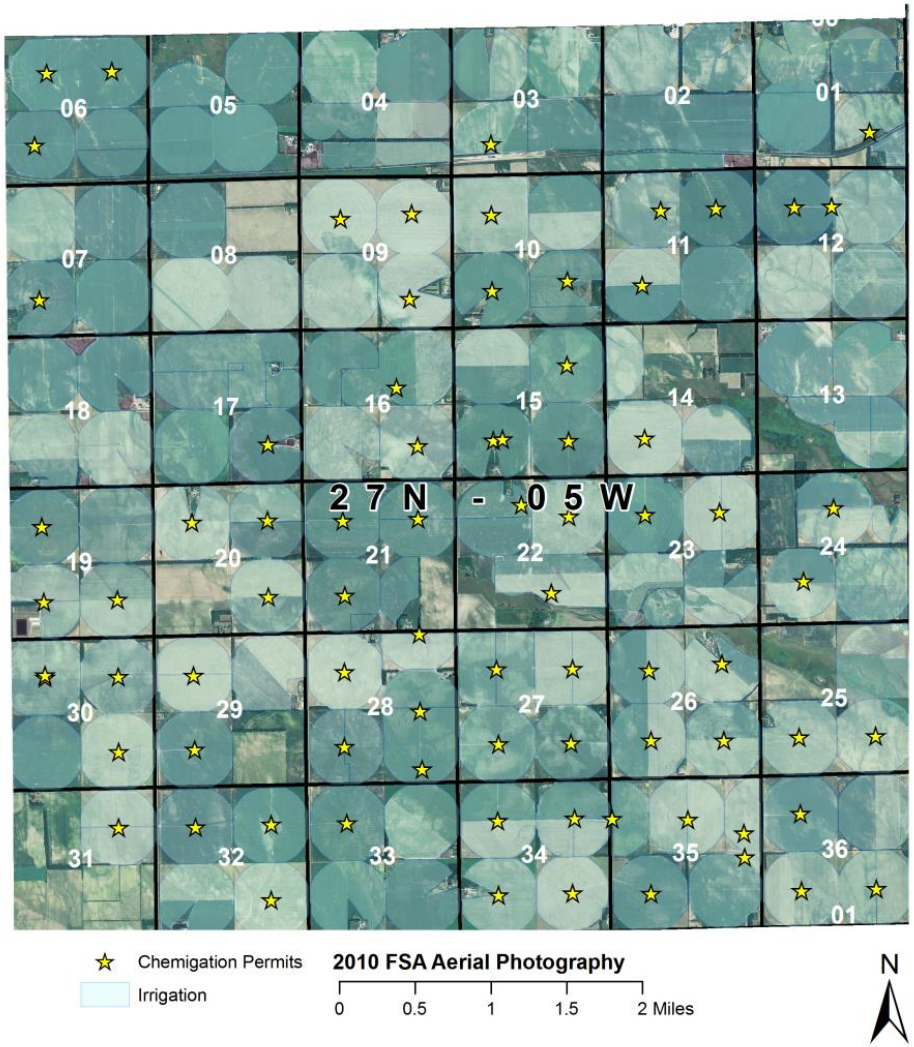


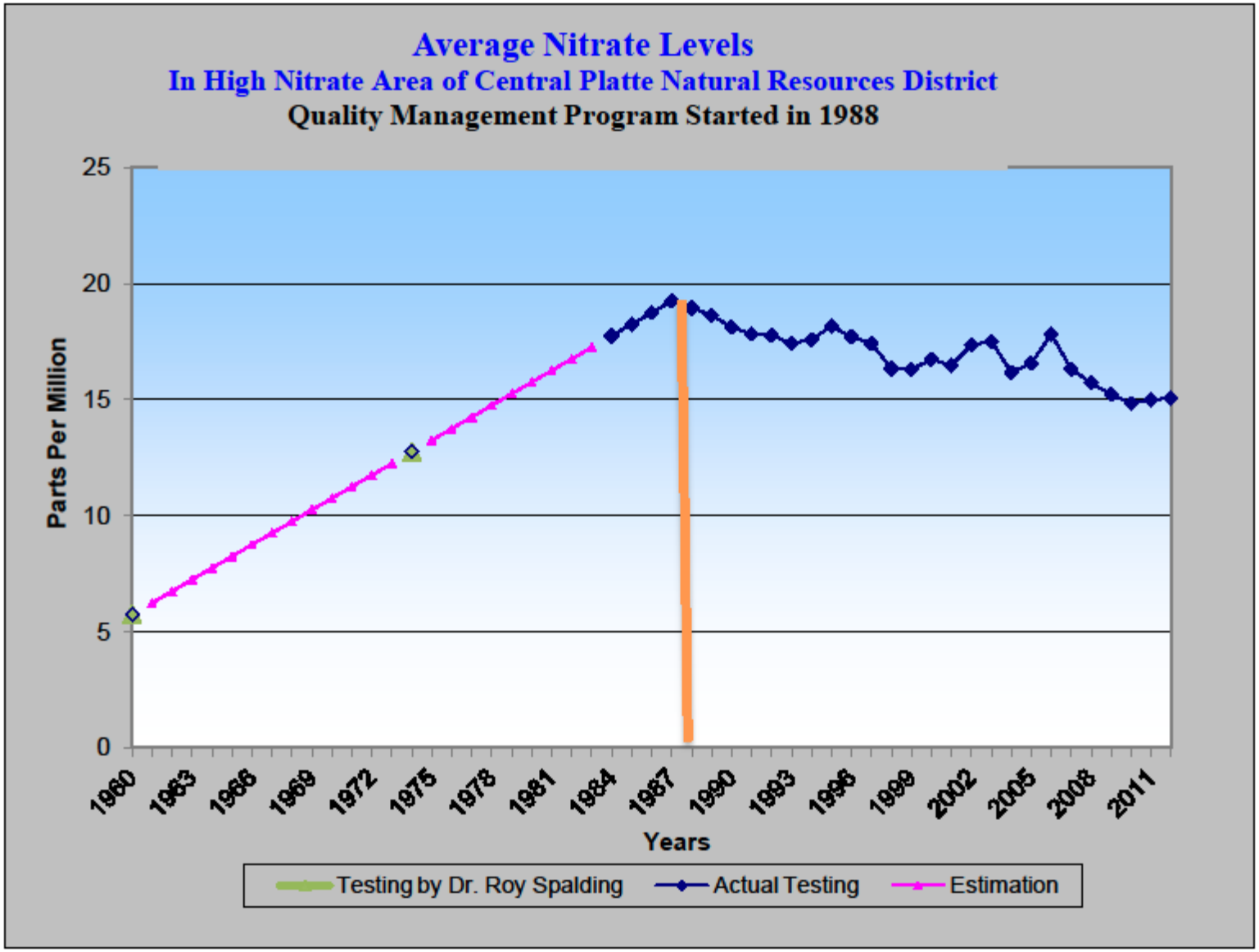
Crawford Township 27N-5W

(Antelope County)

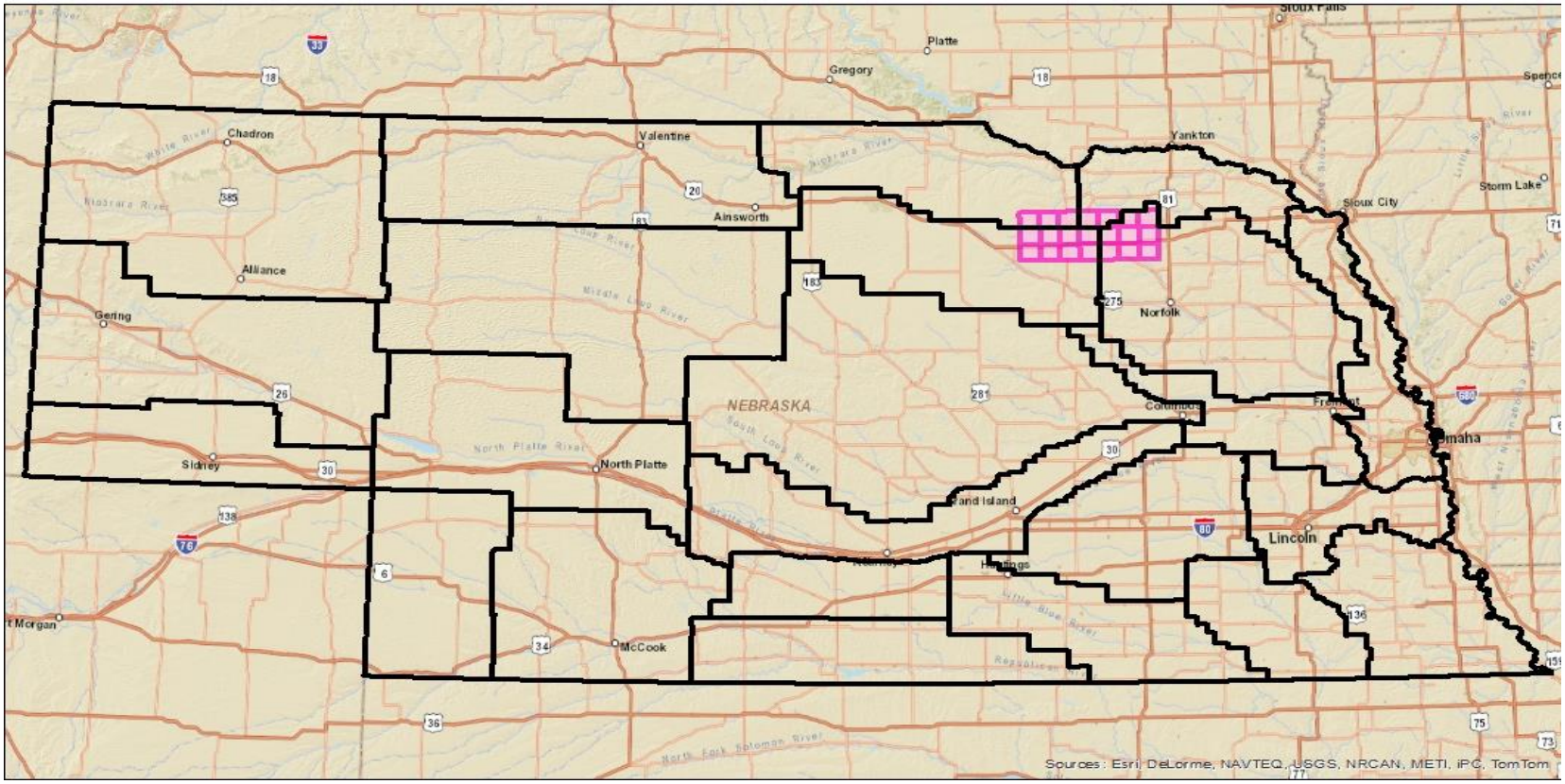


2010 Irrigated Acres	High-Capacity Wells	Chemigation Permits
17,009	137	79



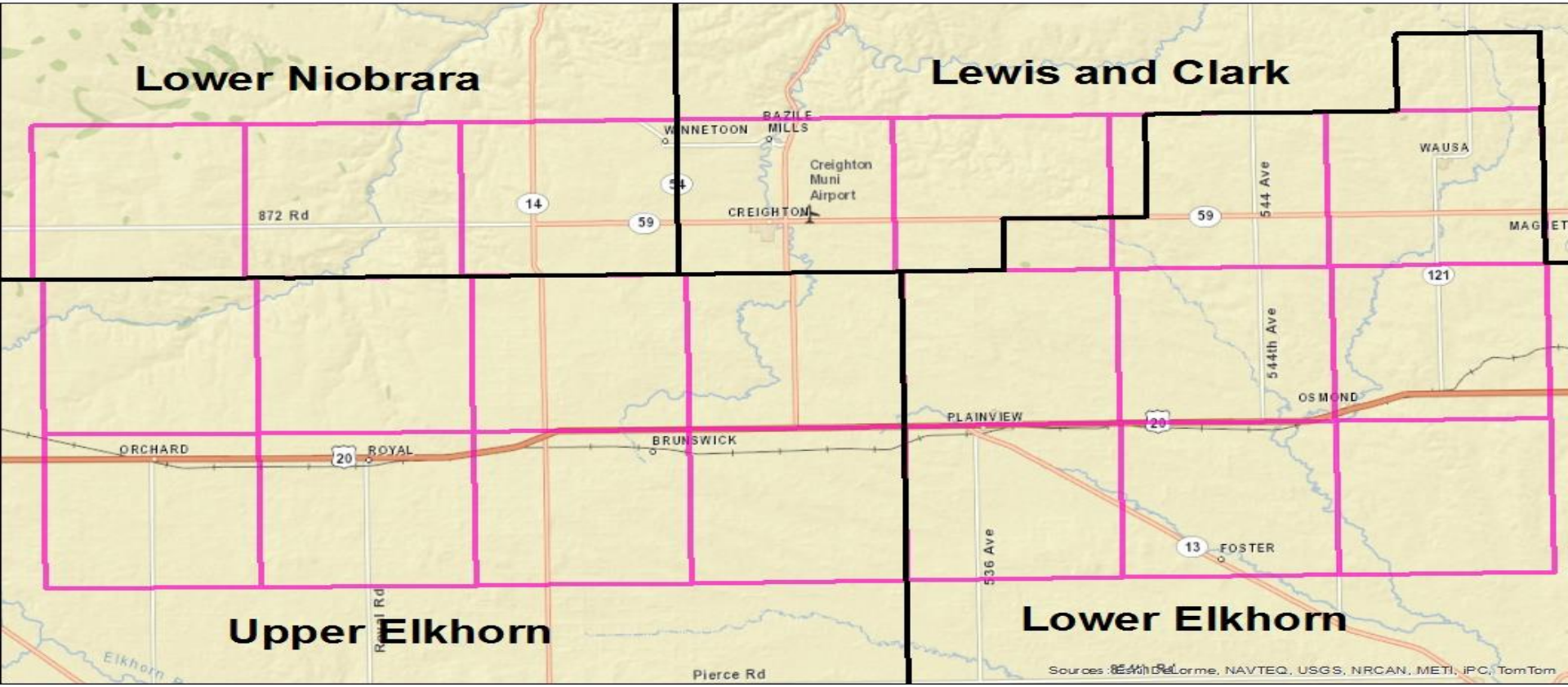

Average Nitrate Levels
In High Nitrate Area of Central Platte Natural Resources District
Quality Management Program Started in 1988
Parts Per Million
25
20
15
10
5
0
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
Years
Testing by Dr. Roy Spalding
Actual Testing
Estimation

Bazile Management Area-4 NRDs



Enlarged Bazile Management Area

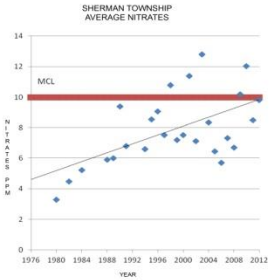
Irrigation & Fertilizer Management-Public Water Supplies

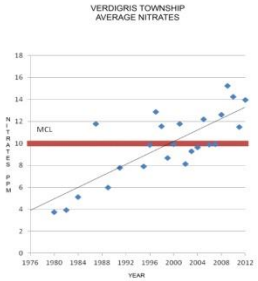


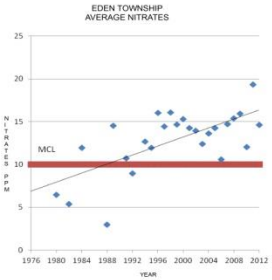
In July 2013, NDEQ was successful in petitioning EPA Region 7 and Headquarters to allow planning and project implementation for groundwater areas **when One or More Public Water Supplies in the area are**:

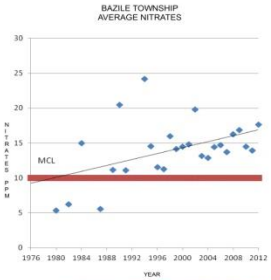
- Treating for Nitrates
- Under Administrative Order for Nitrates
- Required to conduct quarterly sampling for Nitrates.

Upper Elkhorn NRD
BGWMA
Water Quality & Quantity

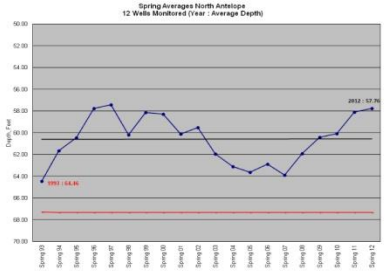


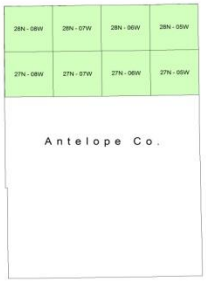


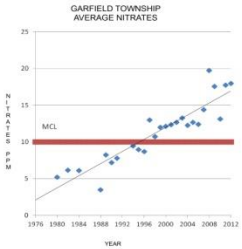


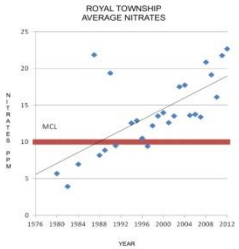


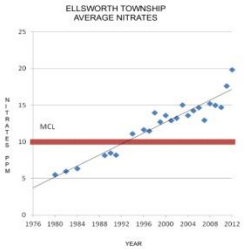
Spring Static Water Levels
1993 - 2012

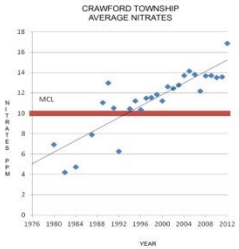










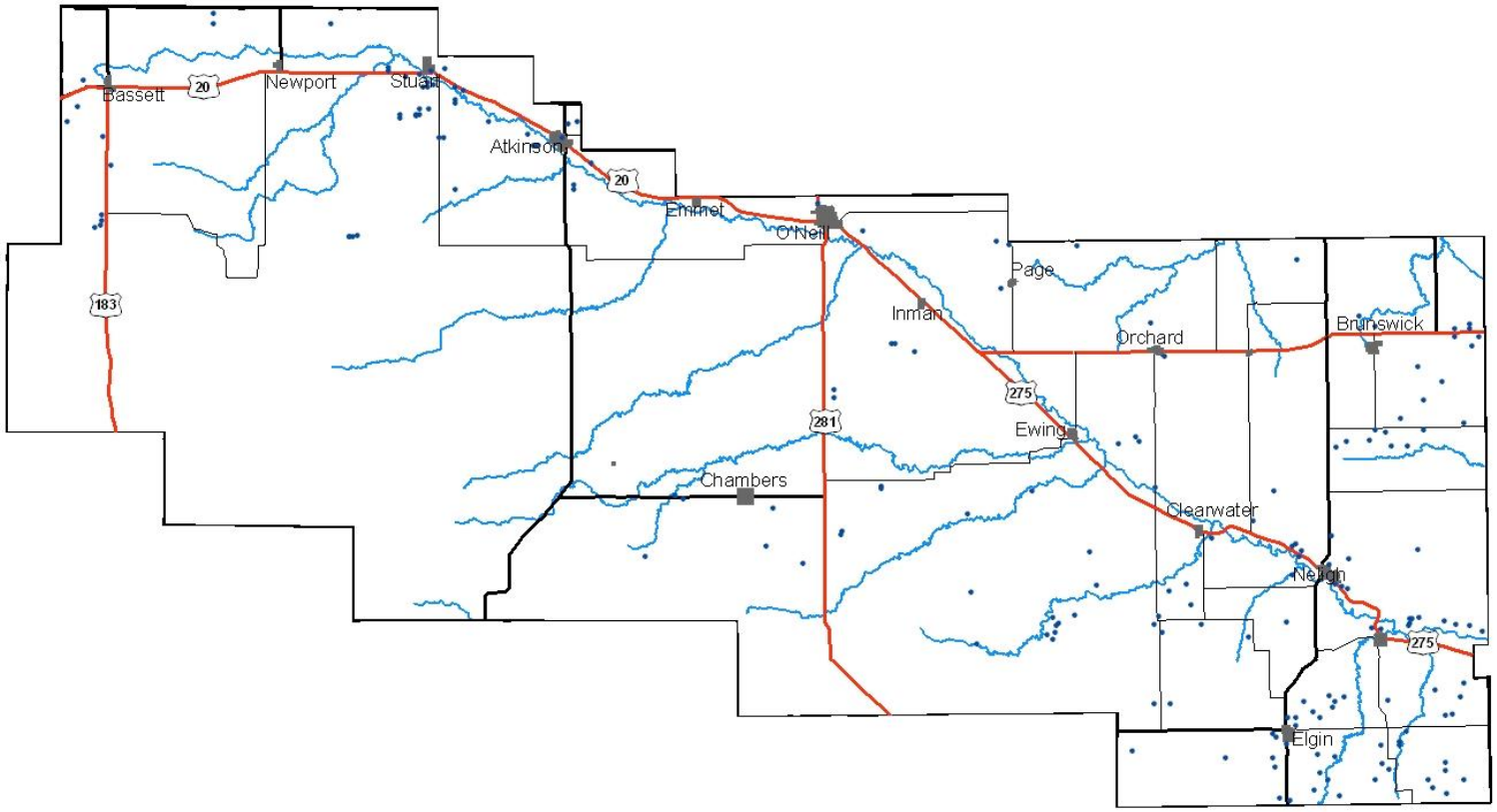


0 1 2 3 4 Miles

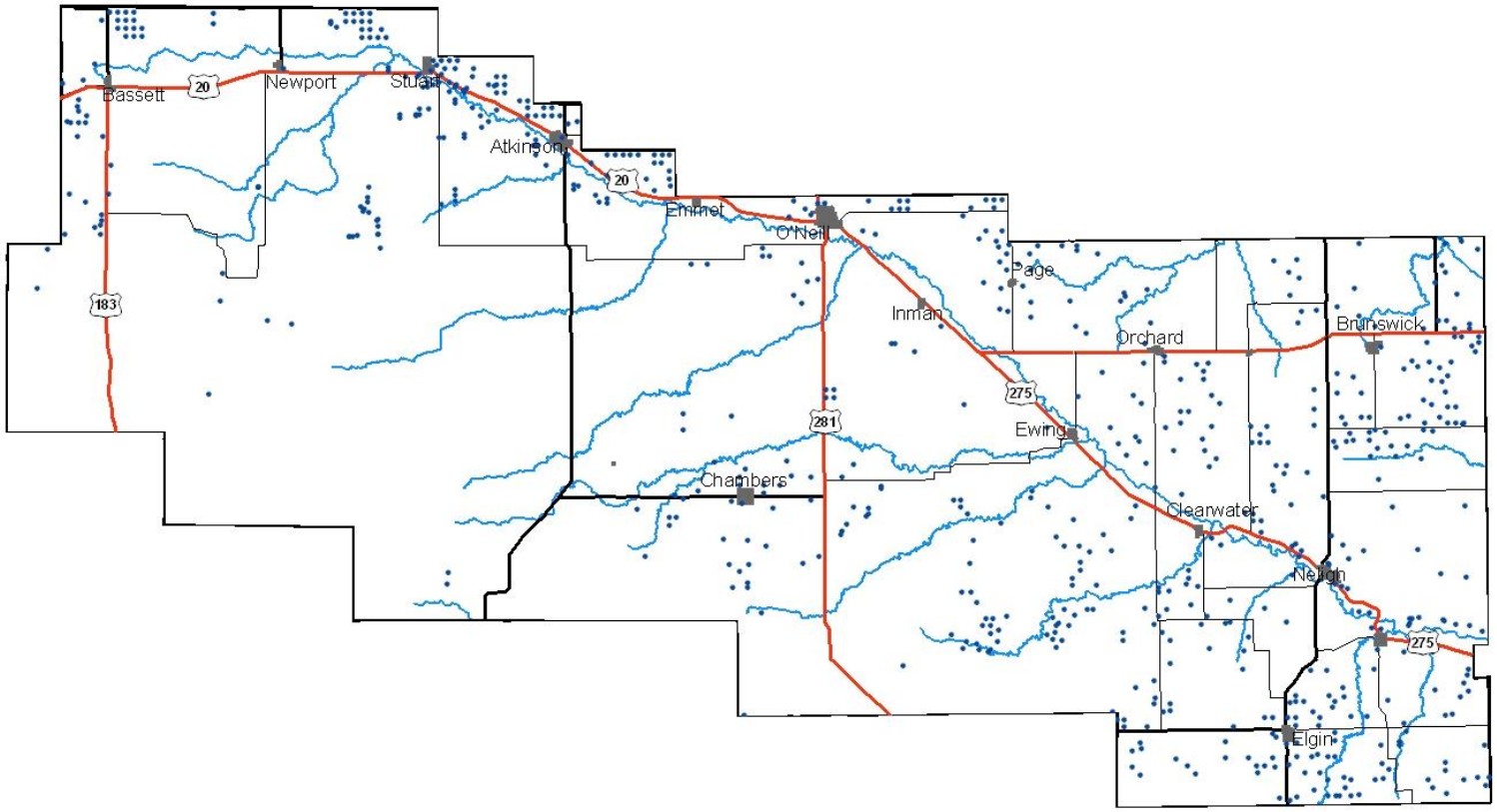
N W E S

GW Well Development in the UENRD

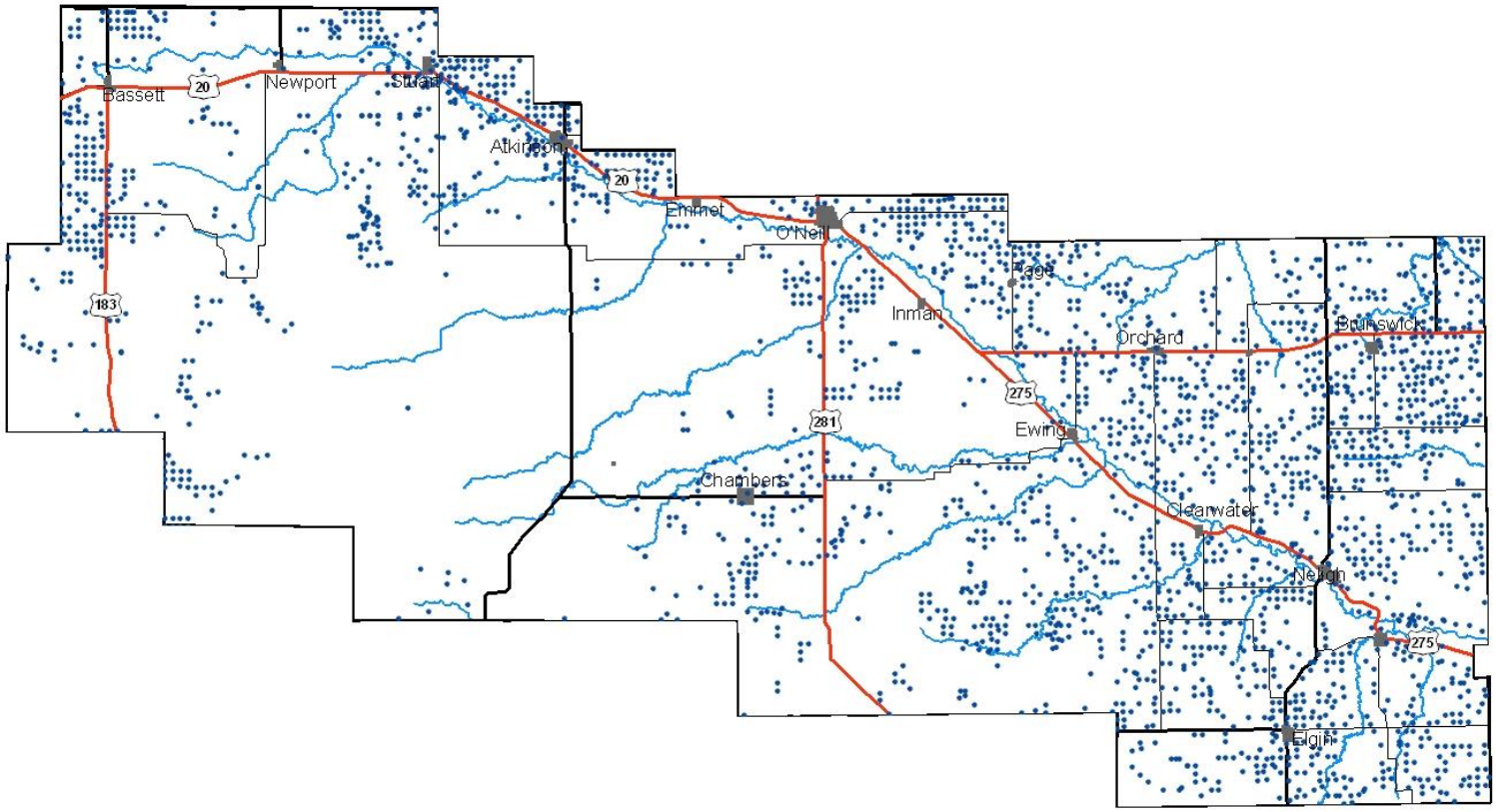
Predevelopment to 1960: 200 Registered Irrigation Wells



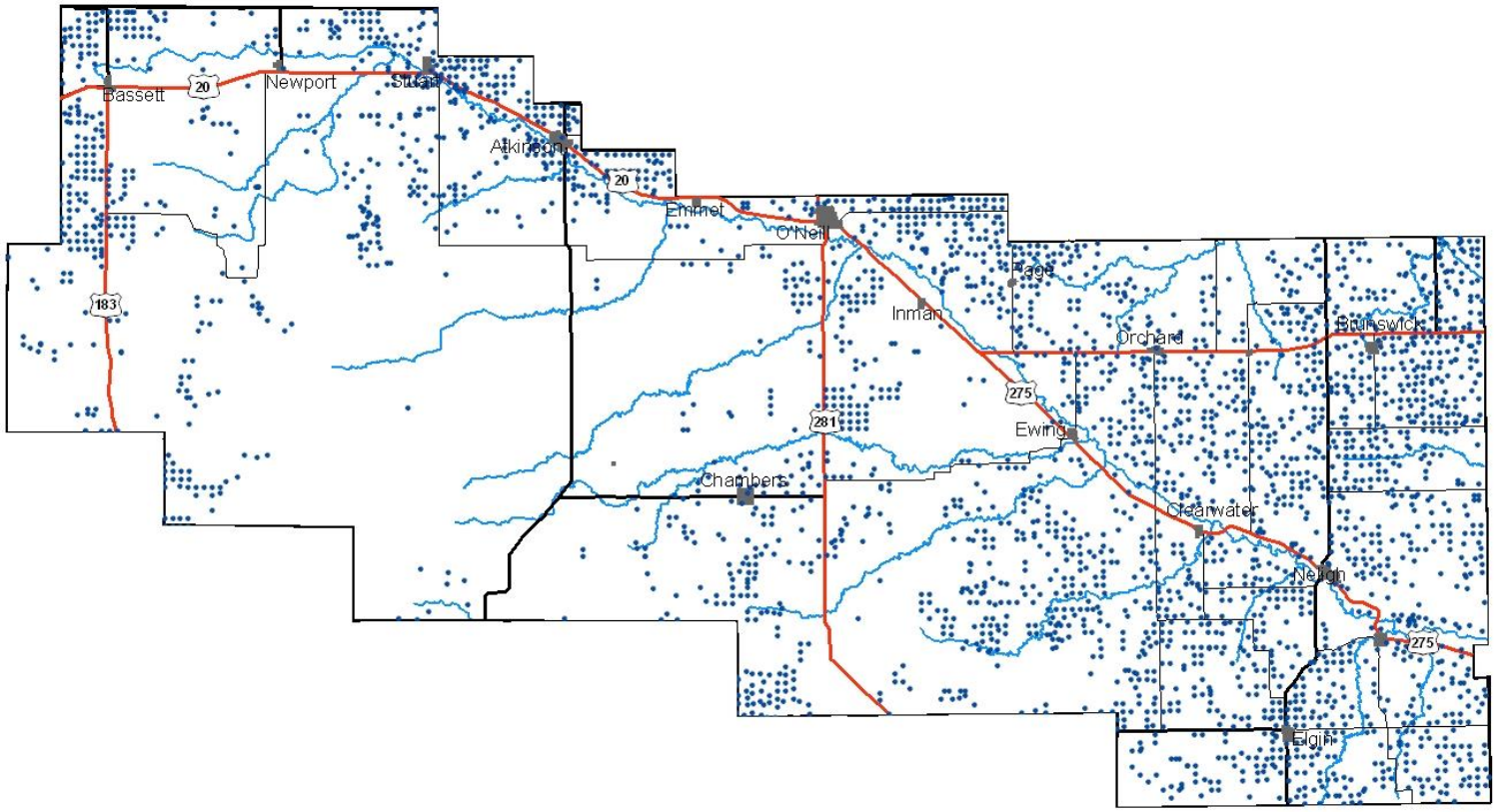
1960-1970 Irrigation Development: 486 New Wells
686 Total Registered Wells



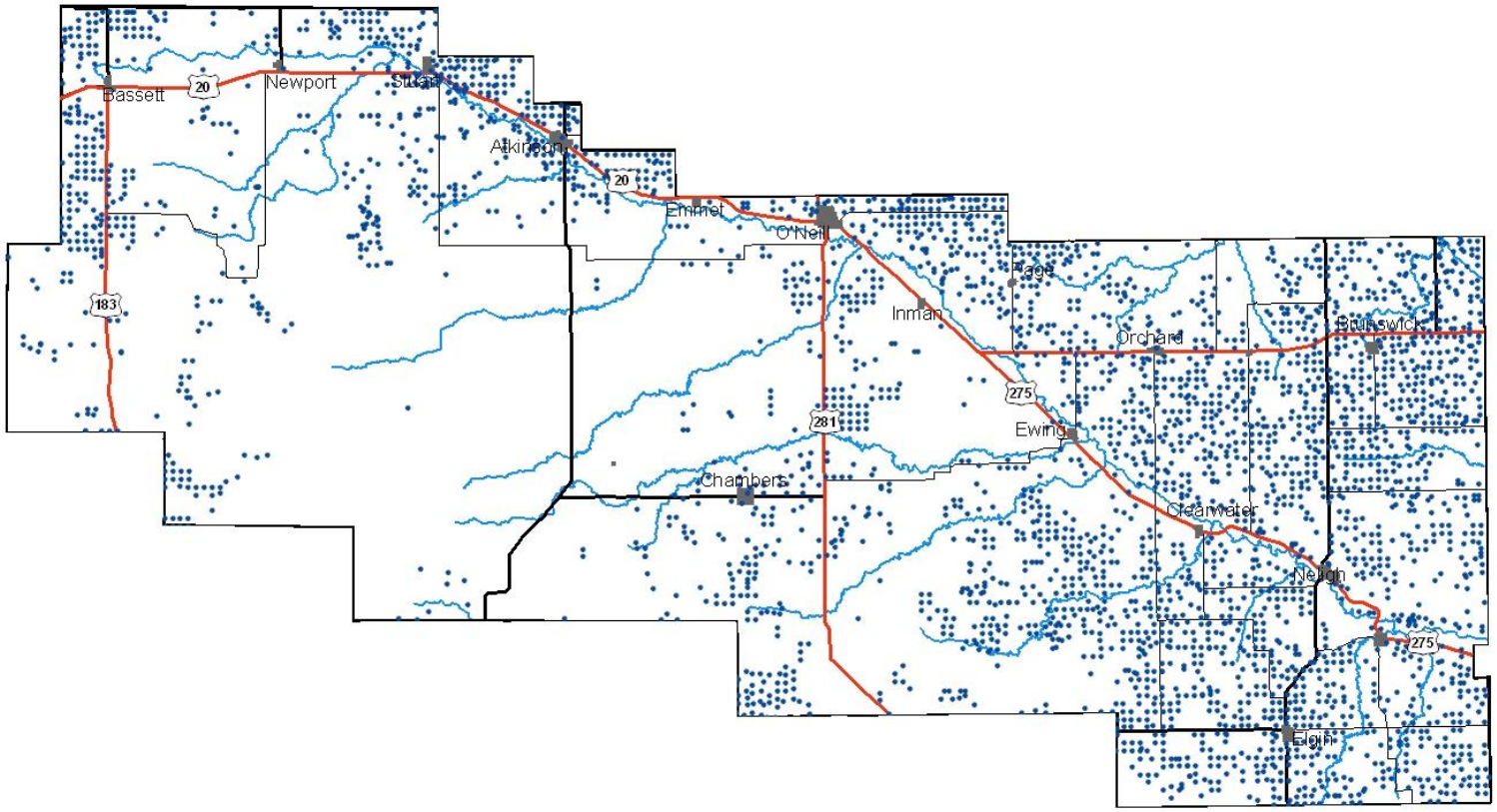
1970 to 1980 Irrigation Development: 1,831 New Wells
2,517 Total Registered Wells



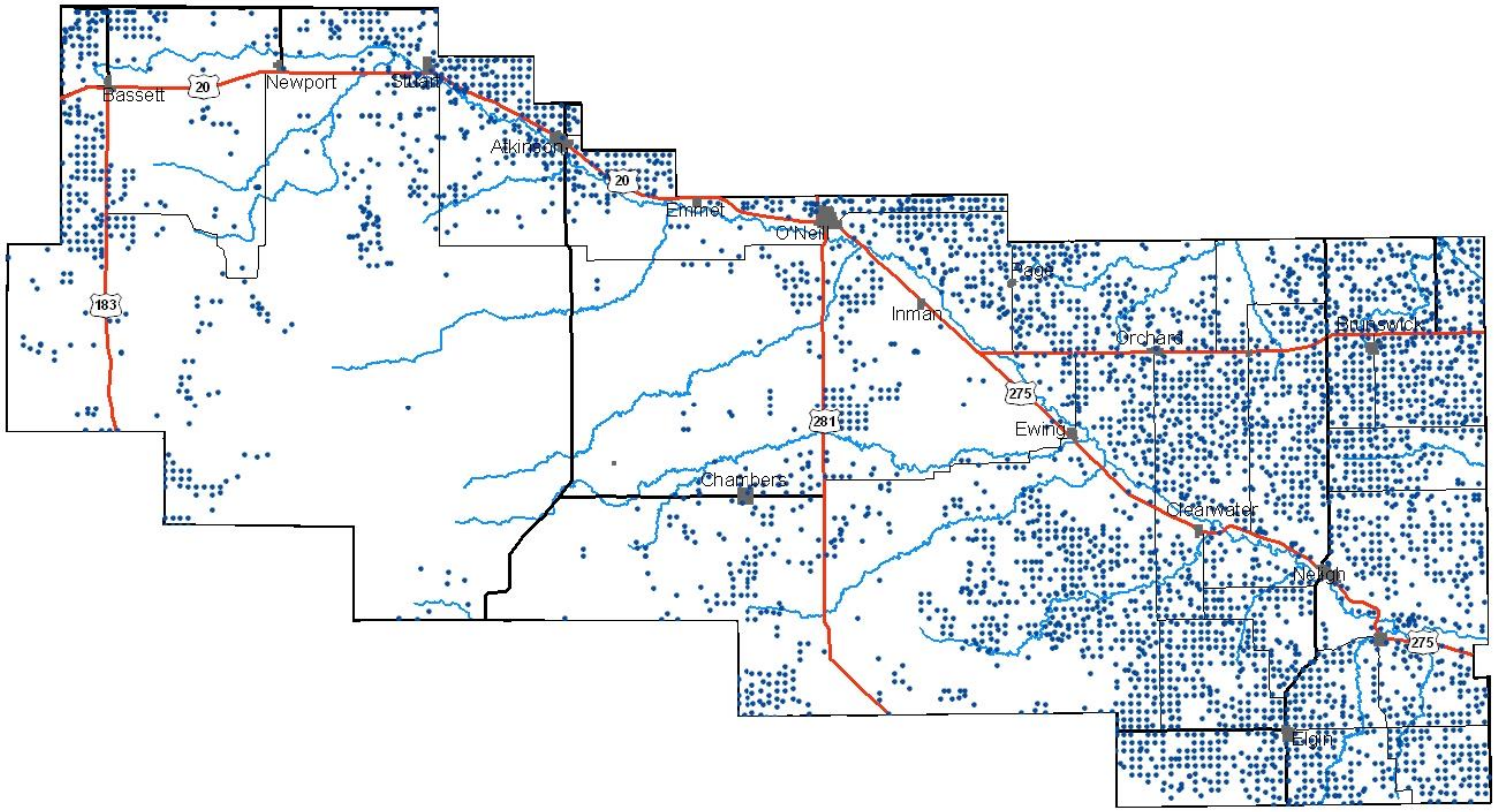
1980 to 1990 Irrigation Development: 501 New Wells
3,018 Total Registered Wells



1990 to 2000 Irrigation Development: 392 New Wells
3,410 Total Registered Wells



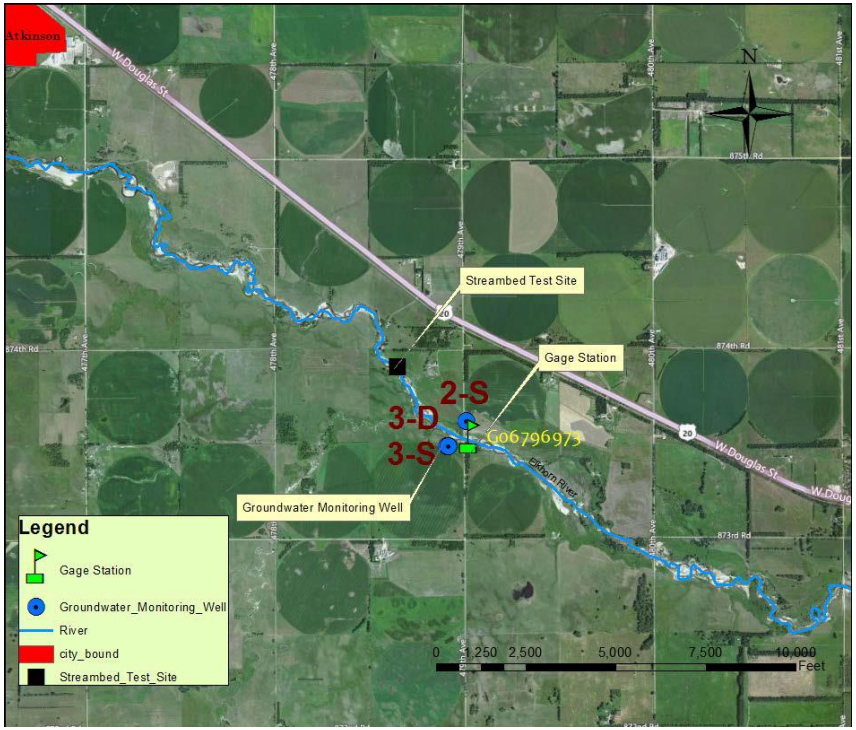
2000 to Present Irrigation Development: 644 New Wells
> 4,200 Total Registered Wells



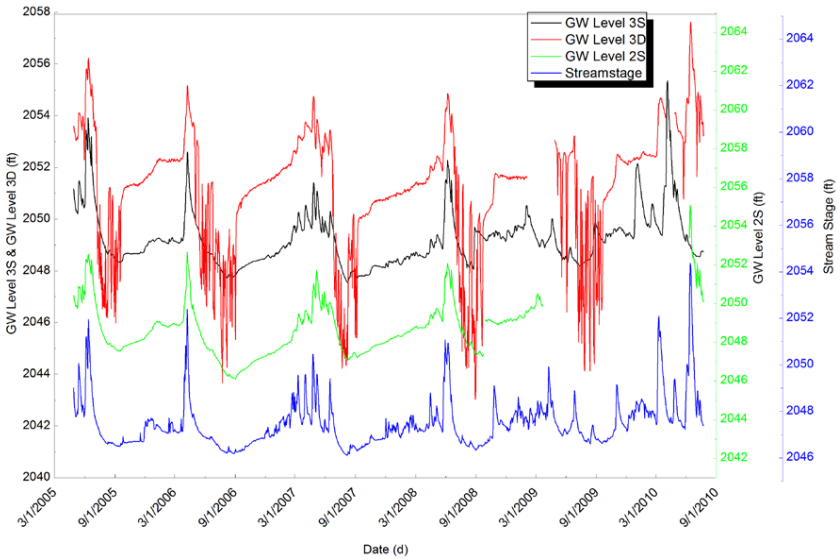
UENRD Further Studies:

CHARACTERIZATION OF THE STREAM-AQUIFER HYDROLOGIC CONNECTION IN THE ELKHORN RIVER BASIN

Dr. Xun-Hong Chen, UNL & Susan Lackey, UNL-CSD

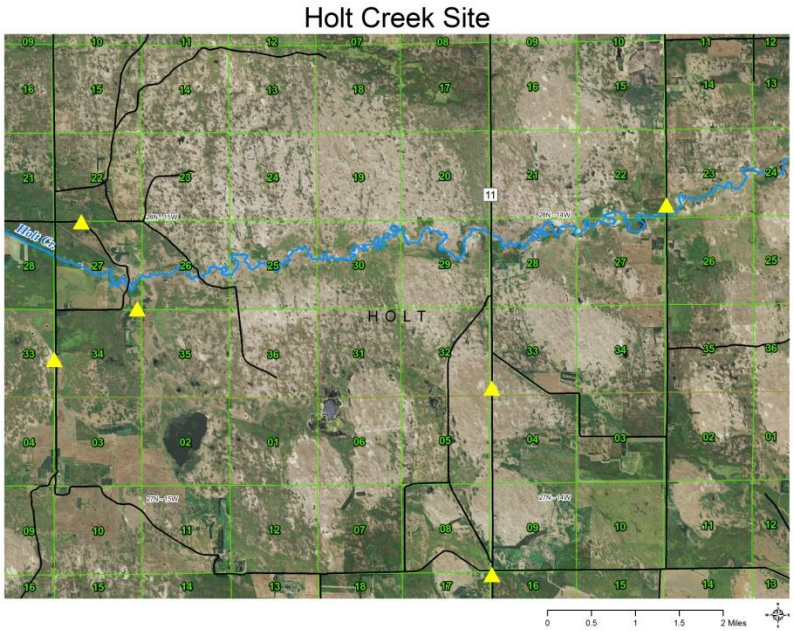


View of monitoring wells, stream gage station, streambed test and test holes location at Atkinson site.



Comparison of stream stage and groundwater level screened at shallow and deep depth.

New Approach to Detailed, Integrated Water Budgets in East-Central Nebraska Drainage Basins



Total Project: $286,400

Environmental Trust: $185,380 NRD's: $37,160 USGS: $51,460 DNR: $8,400 UNL: $4,000

Currently, the UENRD is a member of the Lower Platte River Basin Coalition (7 NRDs & NDNR) to develop a Basin-Wide GW/SW Management Plan. Just formed in 2013, planning for the future water needs of the Lower Platte River Basin. Stay Tuned on this project.

Continue Developing Projects, developing Rules & Regulations for Ground Water Management and Working with NDNR on Surface Water Management

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fax (402) 336-1832

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Protecting Lives, Protecting Property,

Protecting the Future