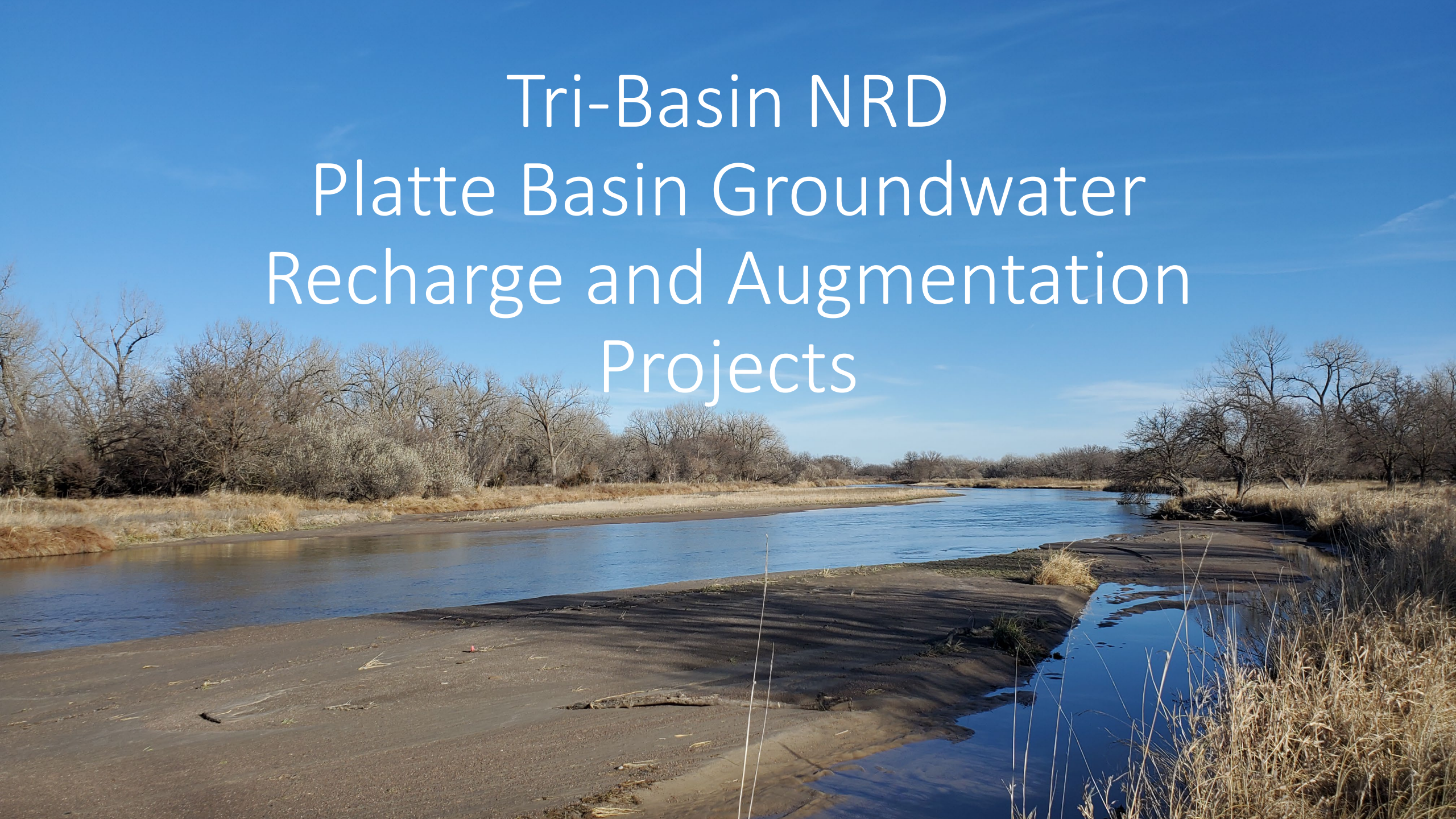


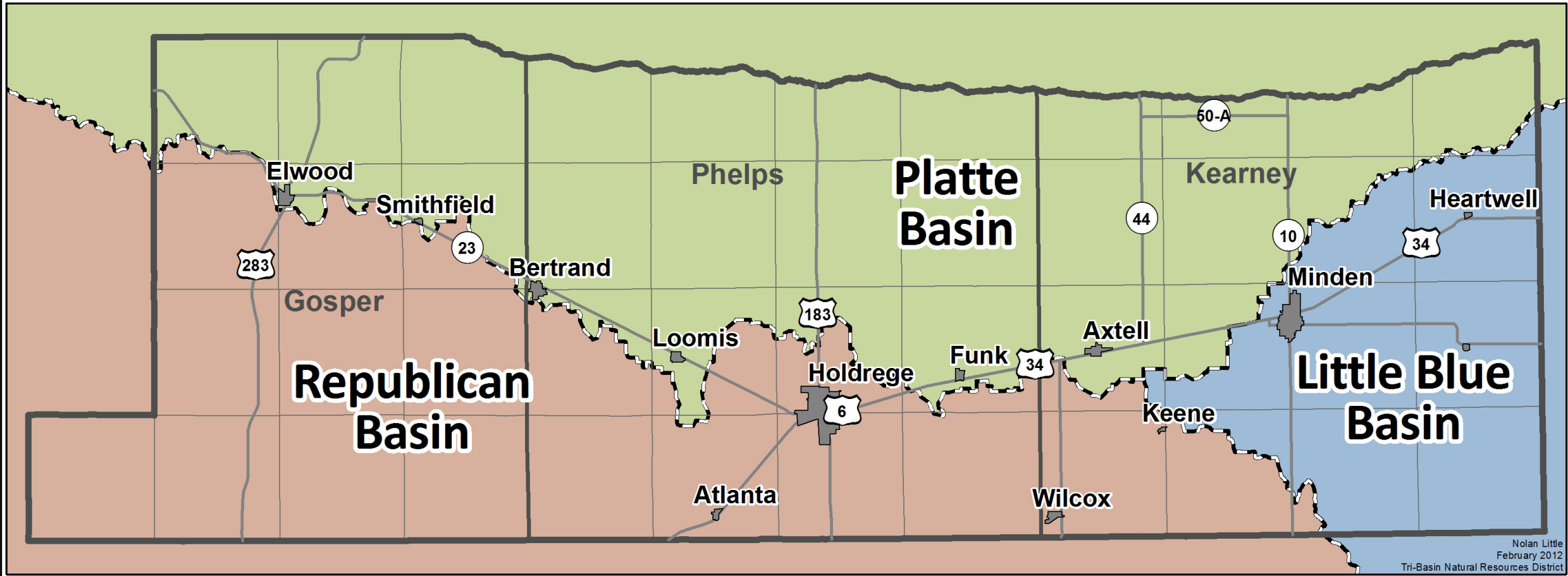
# Tri-Basin NRD Platte Basin Groundwater Recharge and Augmentation Projects





# Tri-Basin Natural Resources District

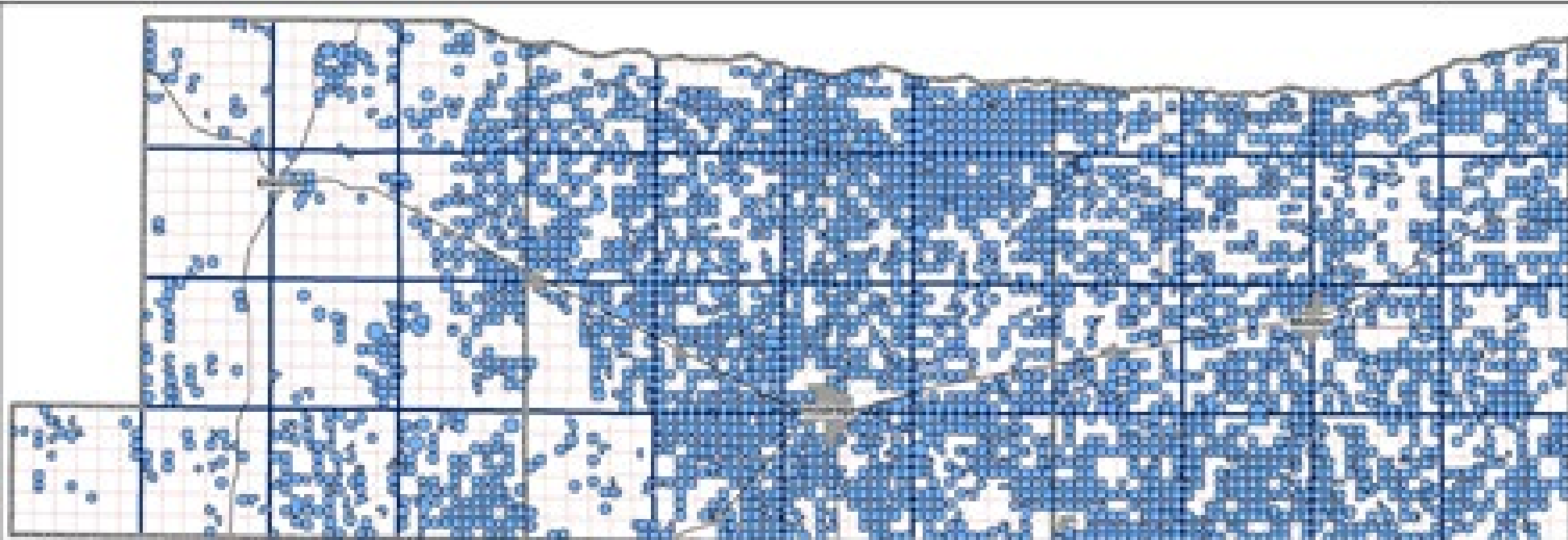
## Basin Boundaries



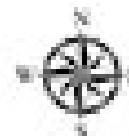
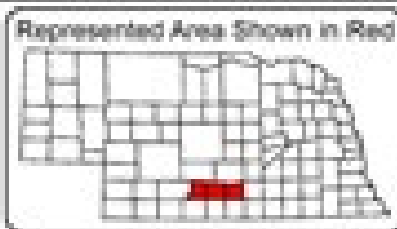


# TRI BASIN NATURAL RESOURCES DISTRICT

## CENTER PIVOT IRRIGATION



1:445,000

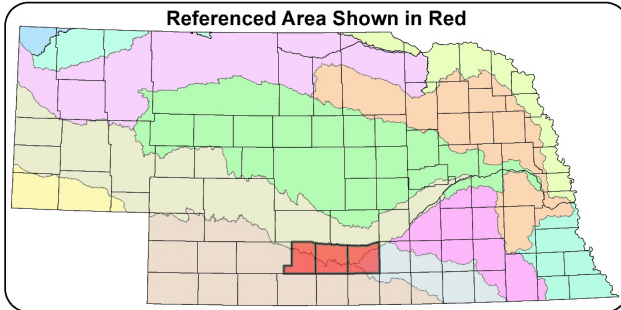
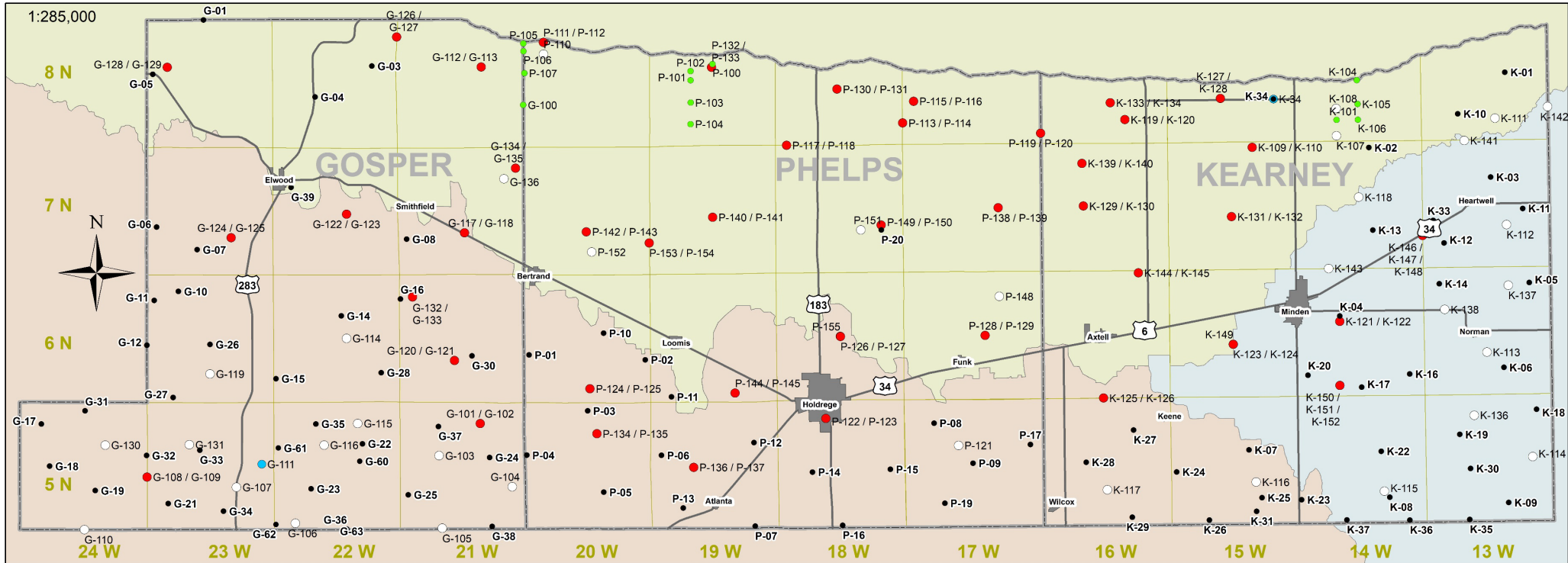


Robert Latta  
November 2012  
Tri Basin Natural Resources District  
*Natural Resources District*



# Tri-Basin Natural Resources District

## Static Water Measurement Wells



• Irrigation Well	— Highway
• Transect Well	▭ County Boundary
• Nested Well	▭ Township
○ Single Well	▭ Little Blue Basin
• Other Well	▭ Republican Basin
■ Community	▭ Platte Basin

**Observation Well Stats:**

- 93 Sites
- 43 Nested Wells
- 137 Data Loggers
- 12 Hour Interval

**Irrigation Well Stats:**

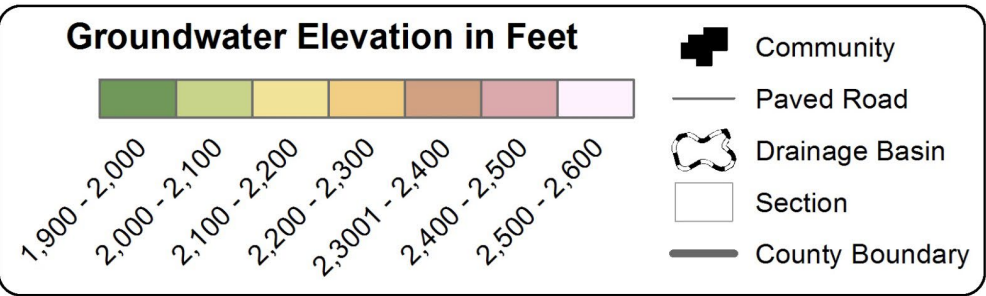
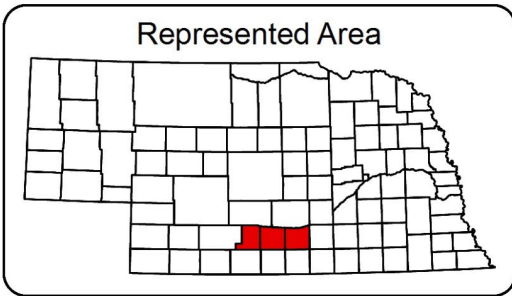
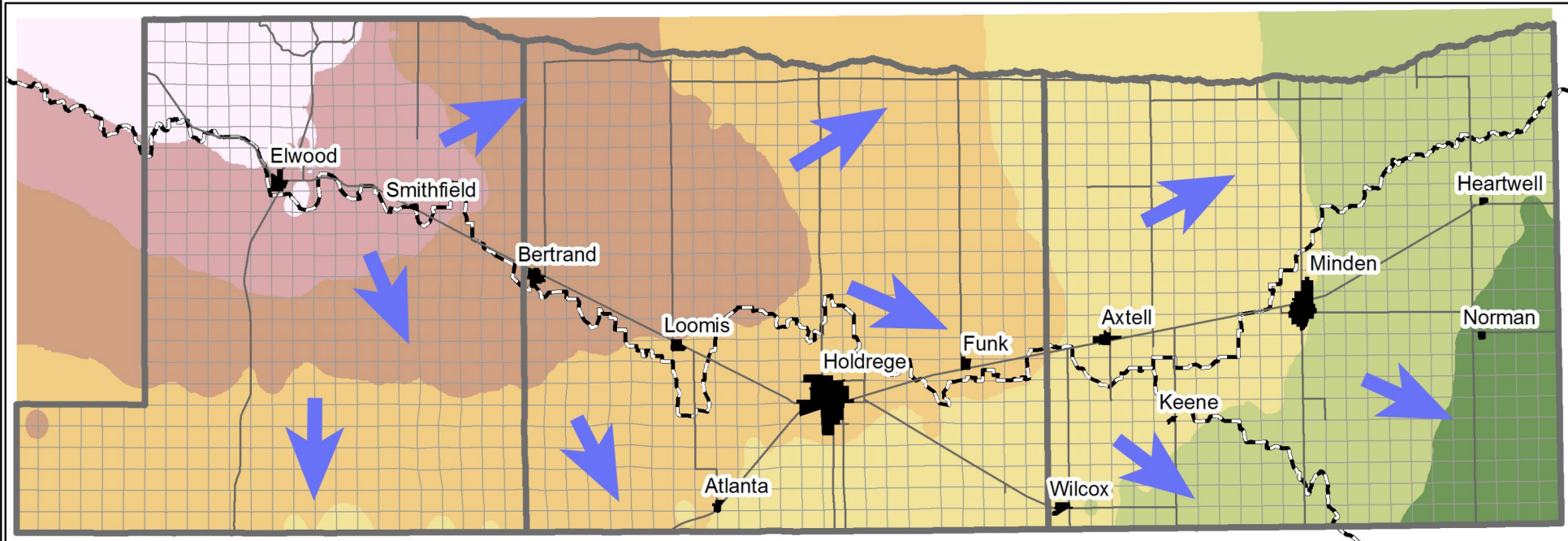
- 10 Platte Basin
- 21 Little Blue Basin
- 59 Republican Basin
- 90 Measured Wells
- Spring & Fall







# Tri-Basin Natural Resources District Groundwater Elevation

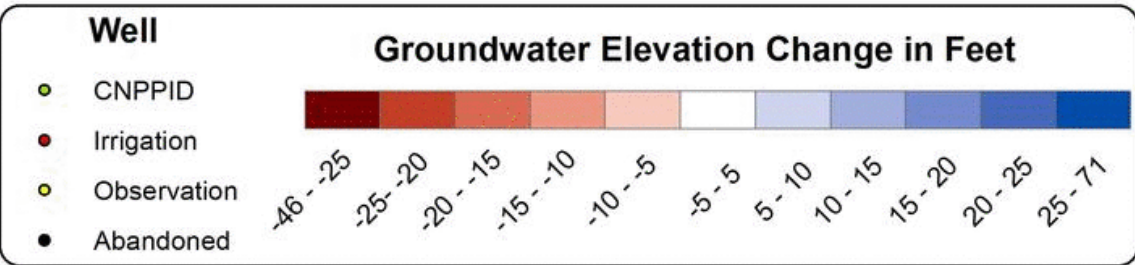
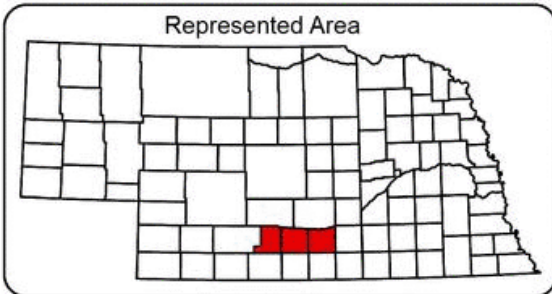
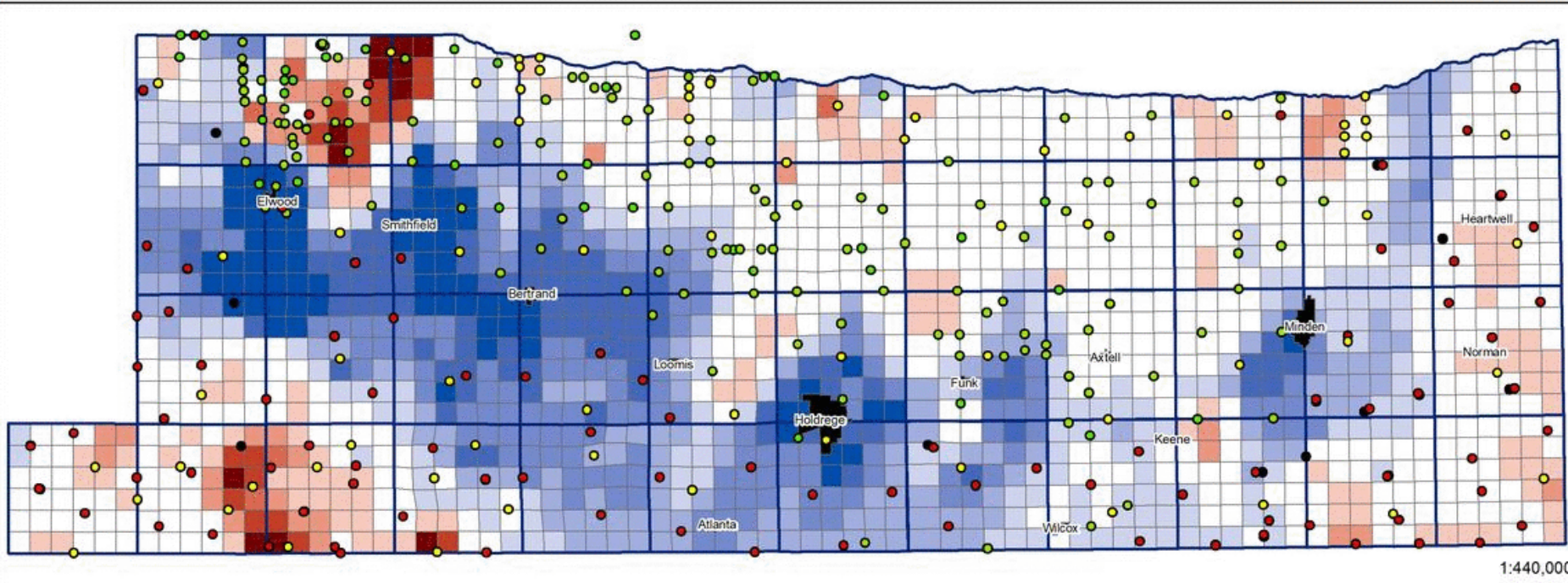


Nolan Little  
January 2013  
Tri-Basin Natural Resources District

# Tri-Basin Natural Resources District

## Change in Groundwater Elevation

### 2010-2012 Average vs 1981-1985 Average

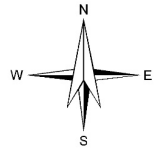
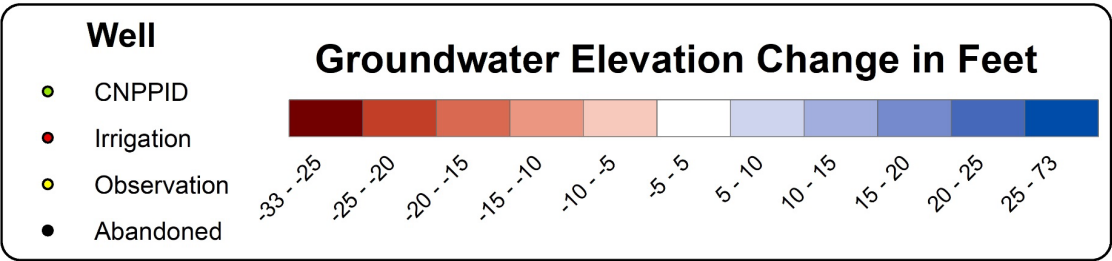
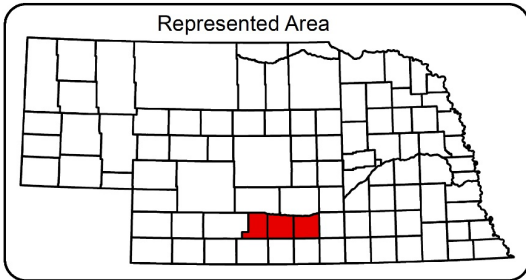
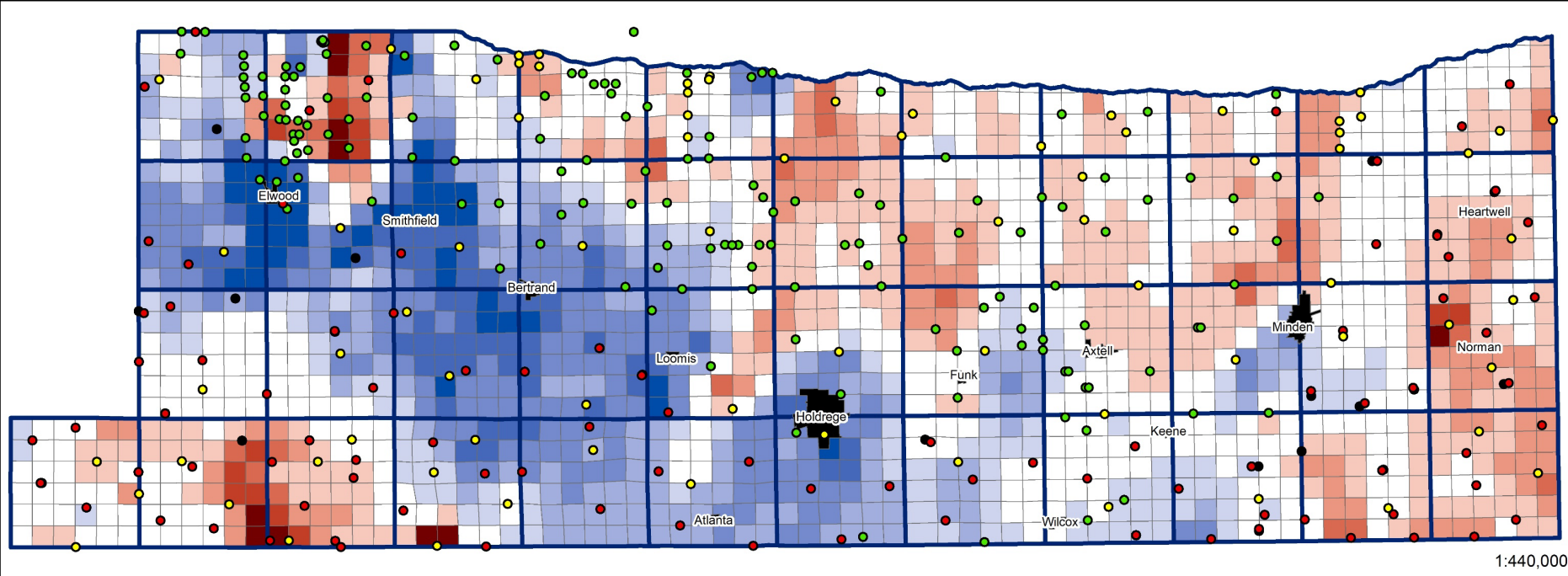


Nolan Little  
January 2013



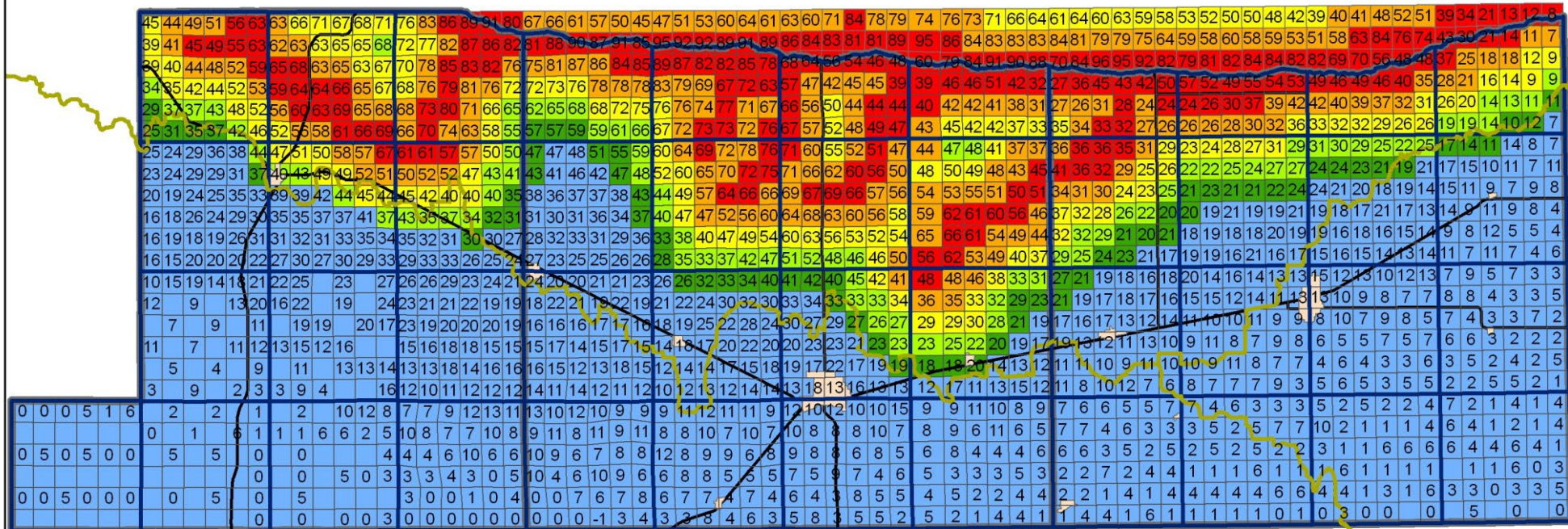
# Tri-Basin Natural Resources District

## Change in Groundwater Elevation 2018-2020 Average vs 1981-1985 Average



# Tri-Basin Natural Resources District

## Platte River Depletion



	Drainage Basin	<b>Depletion Zone</b>
	Township	1
	Sections	2
	Community	3
	Highway	4
	County Boundary	5
		6





WATER !

TRI-COUNTY

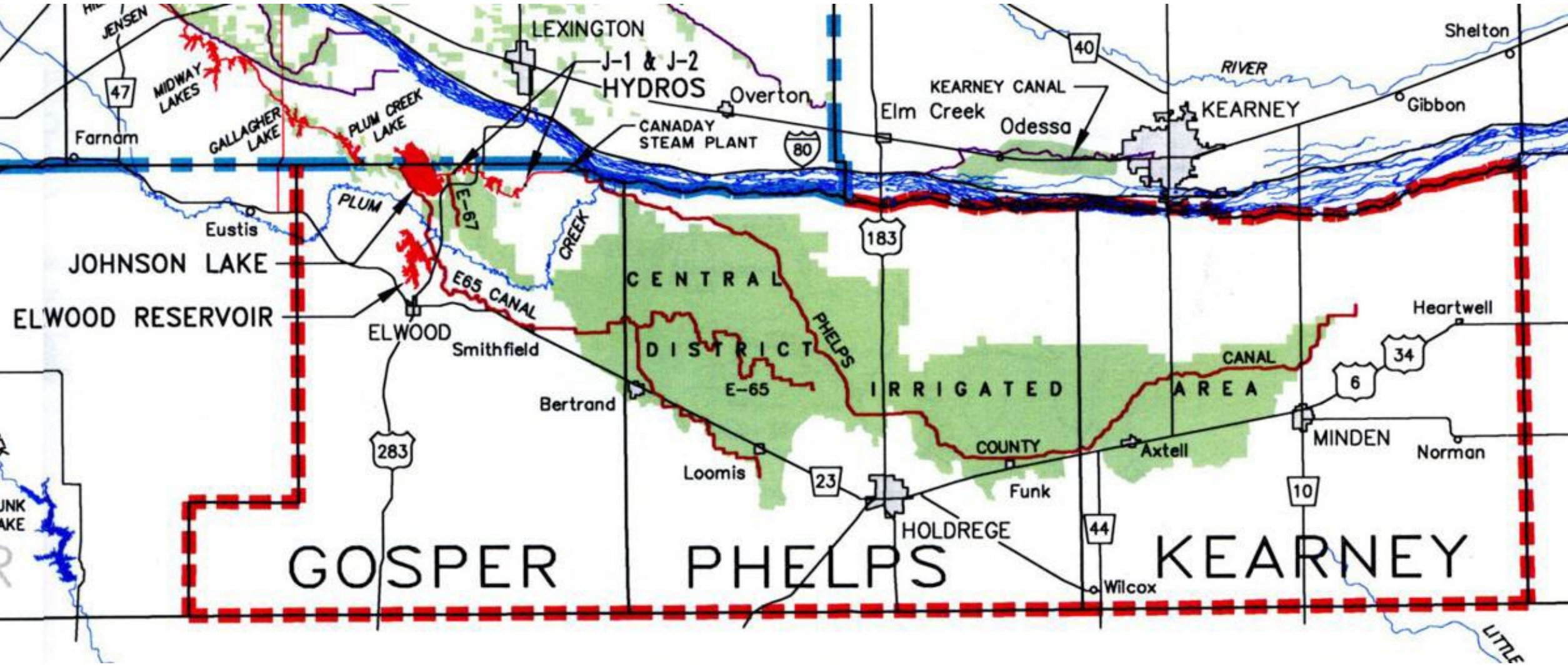
CANAL.



HERE IT  
COMES









# Platte High Flow Diversions

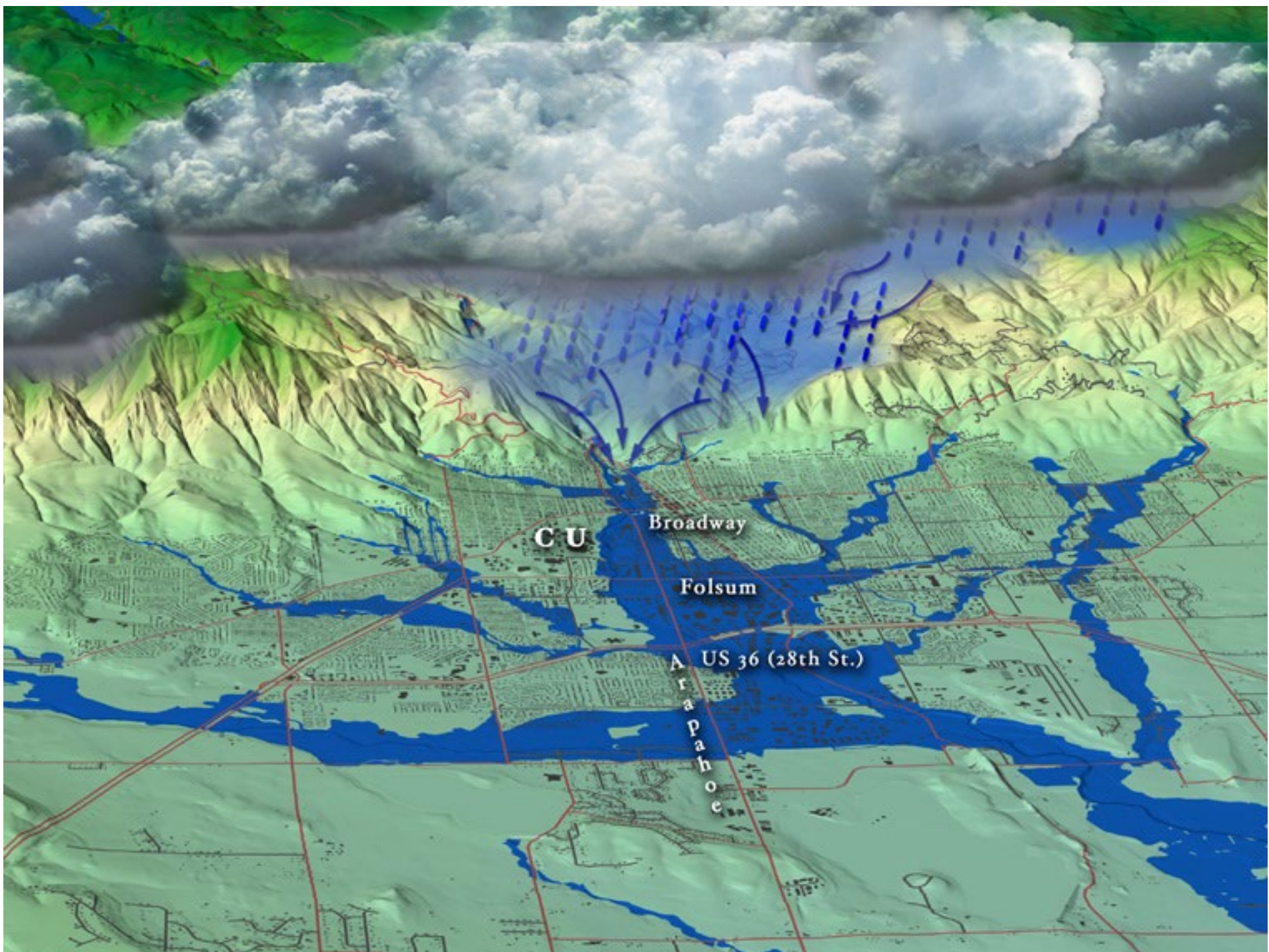
- TBNRD works with CNPPID to divert high Platte flows into canals, wetlands and Elwood reservoir.
- Over 125,000 acre-feet diverted since first diversions in 2006.
- NRD cost of \$16-\$48 per a-f (DNR pays 60% of cost).
- Diversions into Elwood Reservoir and E-65 Canal benefit both Platte and Republican Basins.



# Elwood Reservoir



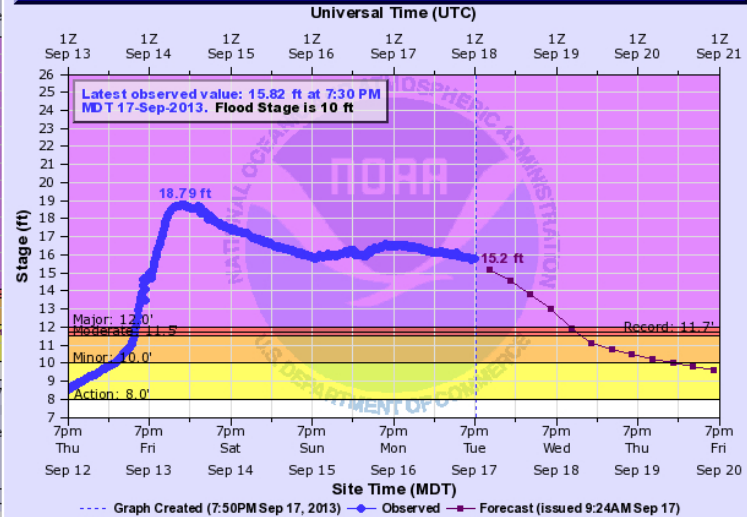








### SOUTH PLATTE RIVER NEAR KERSEY



KERC2(plotting HGIRG) "Gage 0" Datum: 4578.02' | Observations courtesy of CO Division of Water Resources

Printable Image About this graph Tabular Data XML RSS Datum: NAVD88 Metadata

**NOTE:** Forecasts for the South Platte River near Kersey are issued as needed during times of high water, but are not routinely available.

Default Hydrograph

[Return to Area Map](#)

Upstream Gauge Downstream Gauge

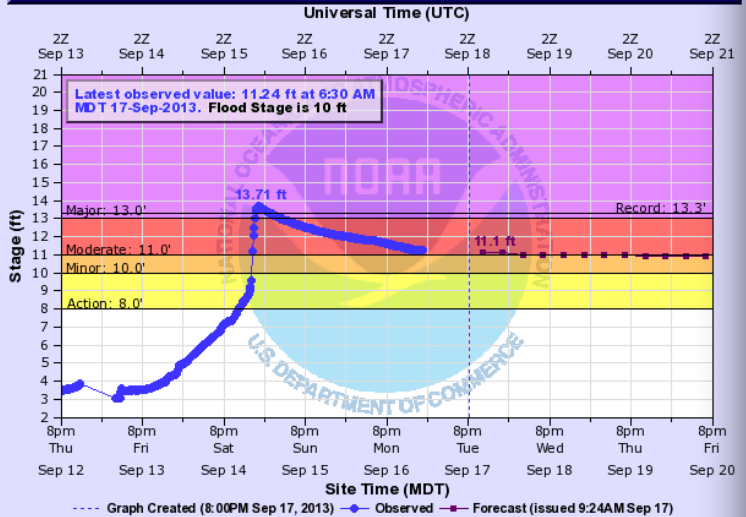
**Flood Categories (in feet)**  
 Major Flood Stage: 12  
 Moderate Flood Stage: 11.5  
 Flood Stage: 10  
 Action Stage: 8

**Historical Crests**  
 (1) 11.73 ft on 05/08/1973  
 (2) 11.50 ft on 05/01/1999  
 (3) 11.00 ft on 05/31/1995  
 (4) 10.75 ft on 06/18/1965  
 (5) 10.70 ft on 05/08/1969  
[Show More Historical Crests](#)

**Low Water Records**  
 Currently none available.



### SOUTH PLATTE RIVER NEAR BALZAC



BZNC2(plotting HGIRG) "Gage 0" Datum: 4135.02' | Observations courtesy of CO Division of Water Resources

Printable Image About this graph Tabular Data XML RSS Datum: NAVD88 Metadata

**NOTE:** Forecasts for the South Platte River near Balzac are issued as needed during times of high water, but are not routinely available.

Default Hydrograph

[Return to Area Map](#)

Upstream Gauge Downstream Gauge

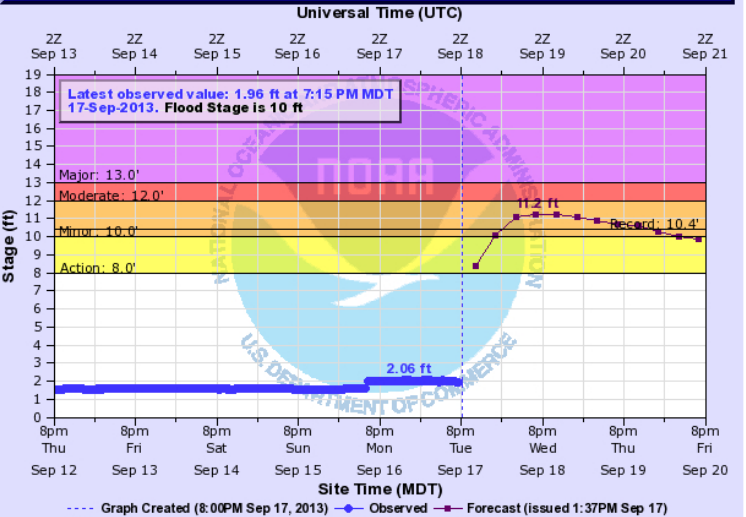
**Flood Categories (in feet)**  
 Major Flood Stage: 13  
 Moderate Flood Stage: 11  
 Flood Stage: 10  
 Action Stage: 8

**Historical Crests**  
 (1) 13.32 ft on 06/18/1965  
 (2) 10.70 ft on 05/09/1973  
 (3) 9.72 ft on 06/15/1970  
 (4) 9.54 ft on 05/18/1980  
 (5) 9.43 ft on 06/12/1995

**Low Water Records**  
 Currently none available.



### SOUTH PLATTE RIVER NEAR JULESBURG



JULC2(plotting HGIRG) "Gage 0" Datum: 3449.8' | Observations courtesy of CO Division of Water Resources

Printable Image About this graph Tabular Data XML RSS Datum: NAVD88 Metadata

**NOTE:** Forecasts for the South Platte River near Julesburg are issued as needed during times of high water, but are not routinely available.

Default Hydrograph

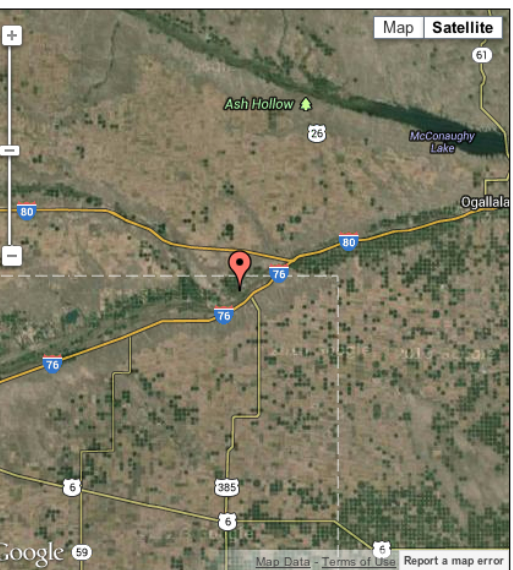
[Return to Area Map](#)

Upstream Gauge Downstream Gauge

**Flood Categories (in feet)**  
 Major Flood Stage: 13  
 Moderate Flood Stage: 12  
 Flood Stage: 10  
 Action Stage: 8

**Historical Crests**  
 Currently none available.

**Low Water Records**  
 Currently none available.



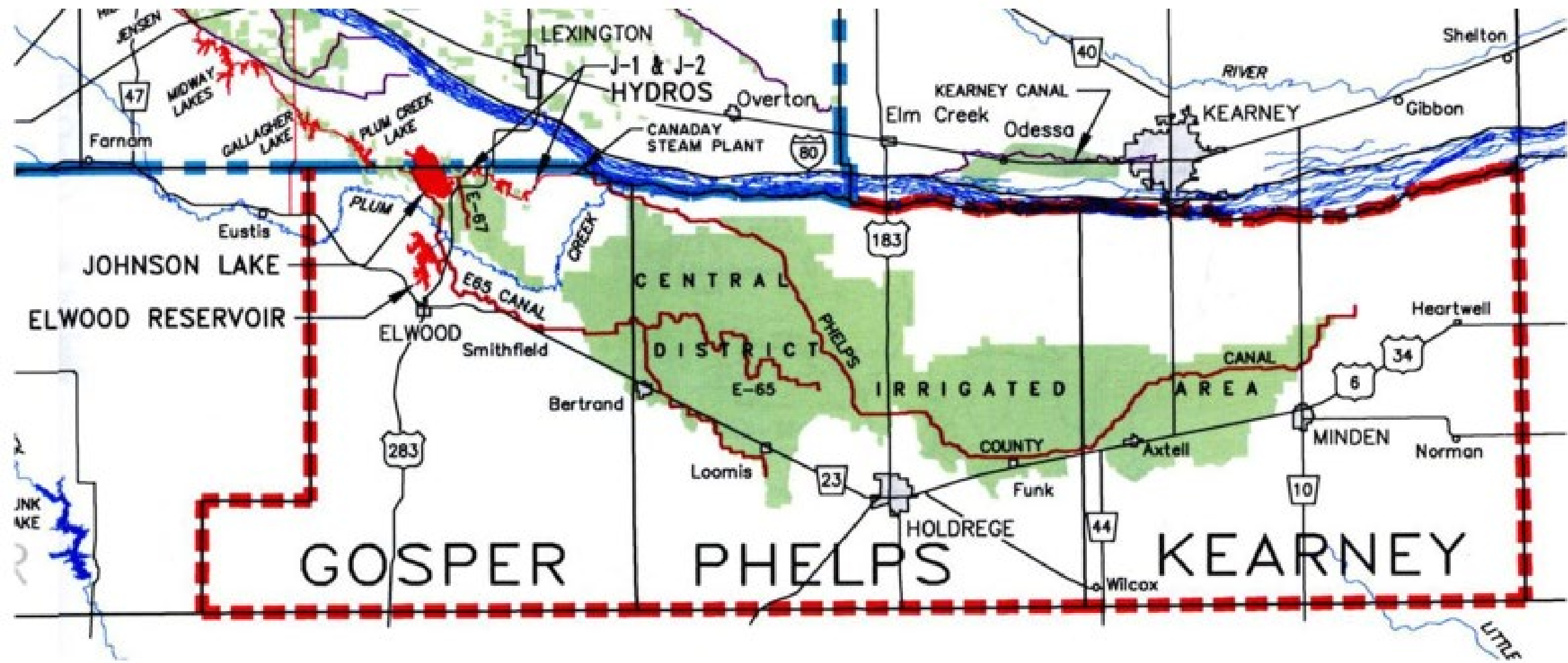


South Platte River near Big Springs, NE on Monday



South Platte River near Big Springs, NE on Wednesday Afternoon

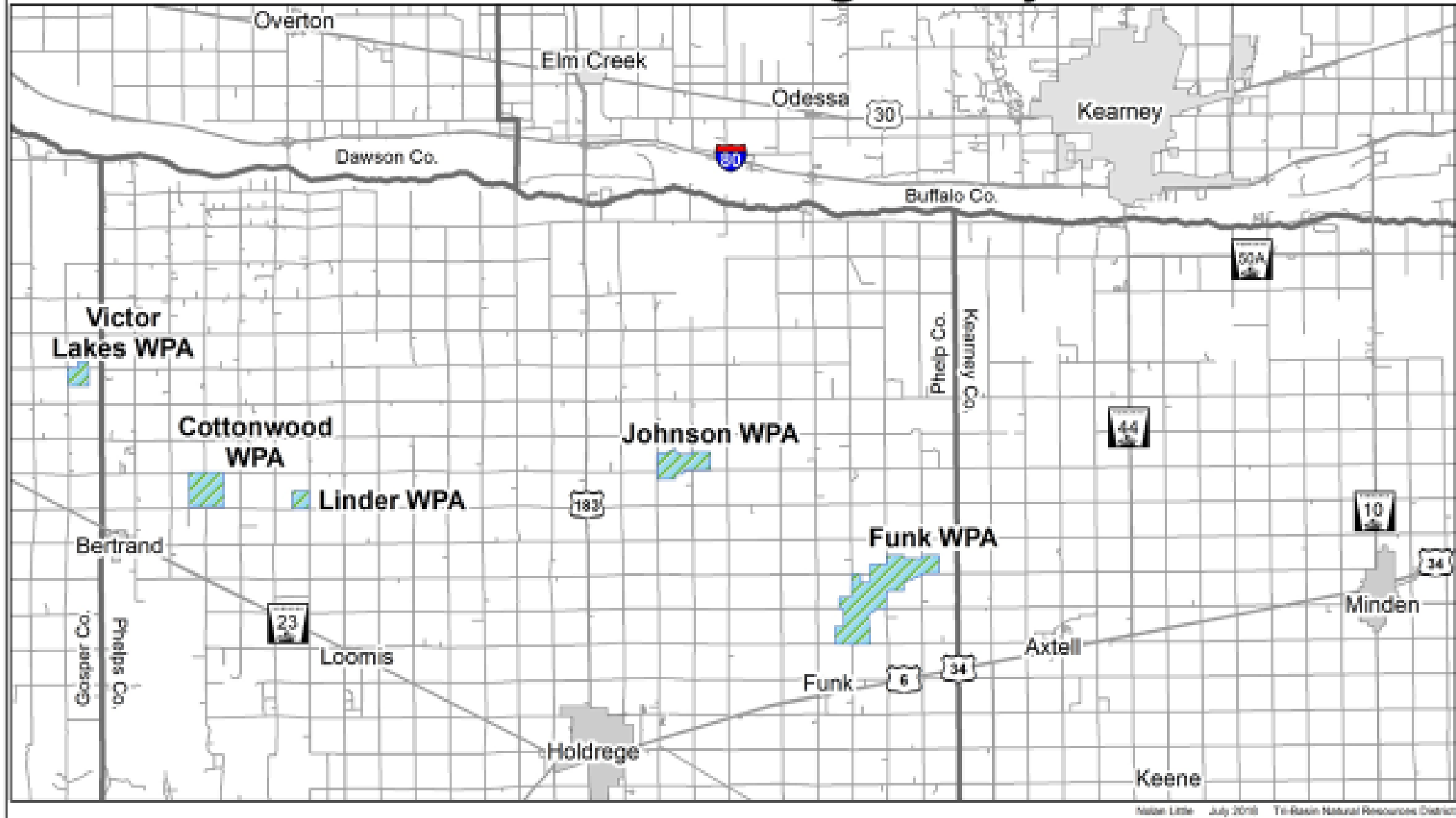




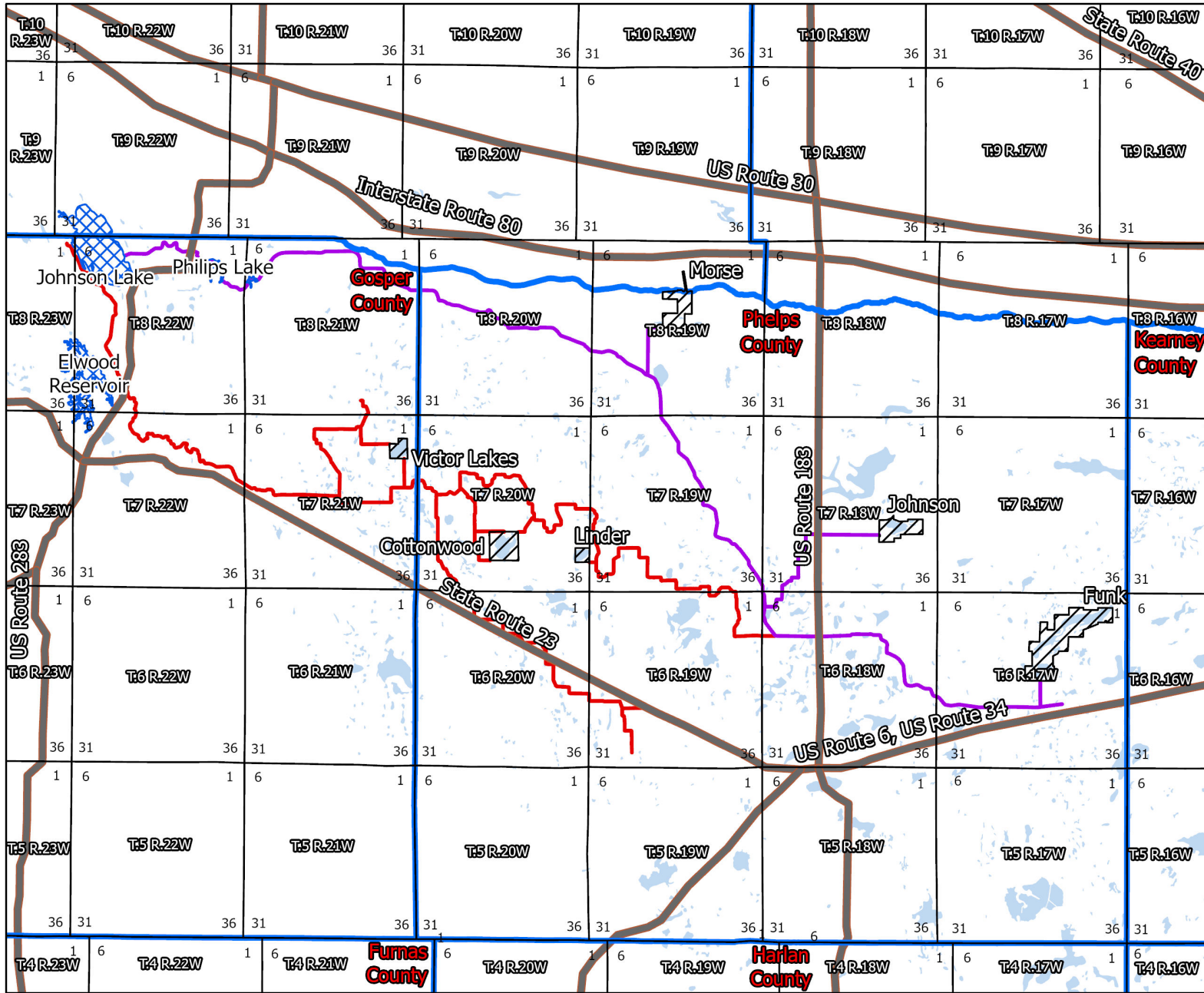




# Wetland Recharge Project





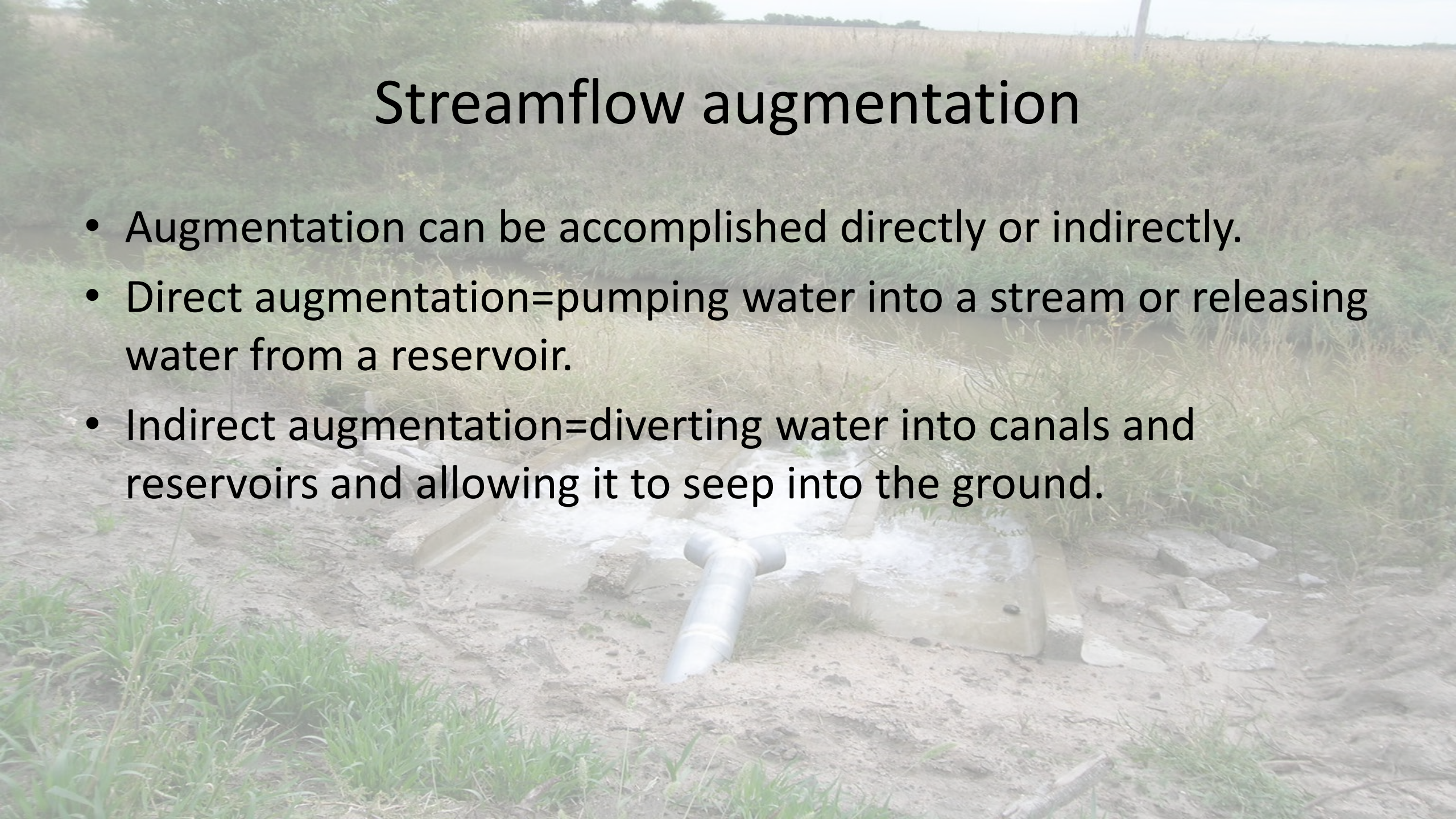


-  Townships
-  Wetlands of Concern
-  Lakes
-  Canals East
-  Canals West
-  Major Roads
-  Counties
-  Wetlands



# Streamflow augmentation

- Augmentation can be accomplished directly or indirectly.
- Direct augmentation=pumping water into a stream or releasing water from a reservoir.
- Indirect augmentation=diverting water into canals and reservoirs and allowing it to seep into the ground.

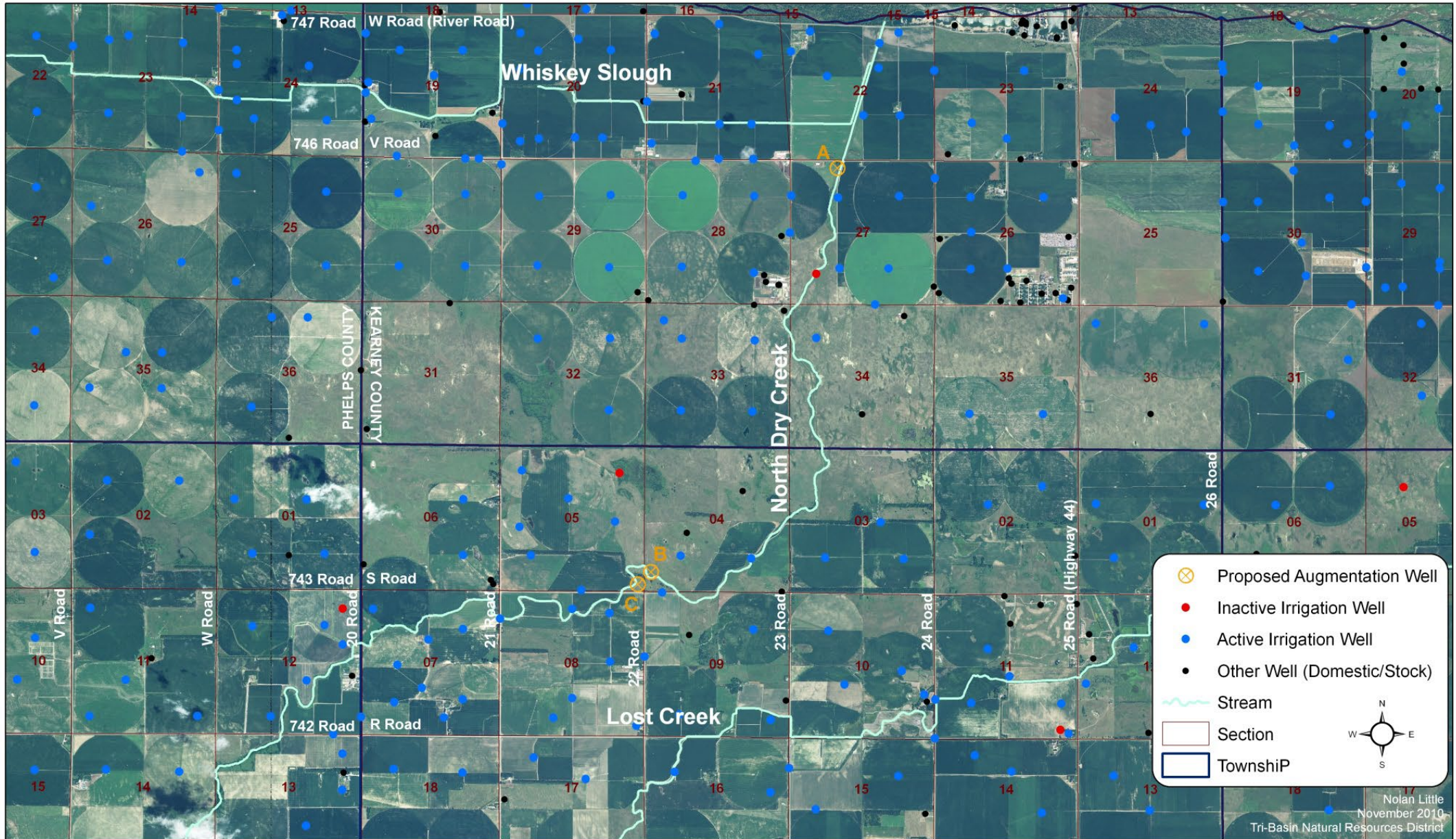




# North Dry Creek Streamflow Augmentation Project

- TBNRD developed first streamflow augmentation well project in Nebraska.
- Located on North Dry Creek (Platte Trib. Near Kearney).
- First well completed in 2011, second well in 2014.
- DNR paid 50% of cost.
- Pumping cost is \$12-14 per creditable a-f.

# Tri-Basin Natural Resources District North Dry Creek Streamflow Augmentation Project



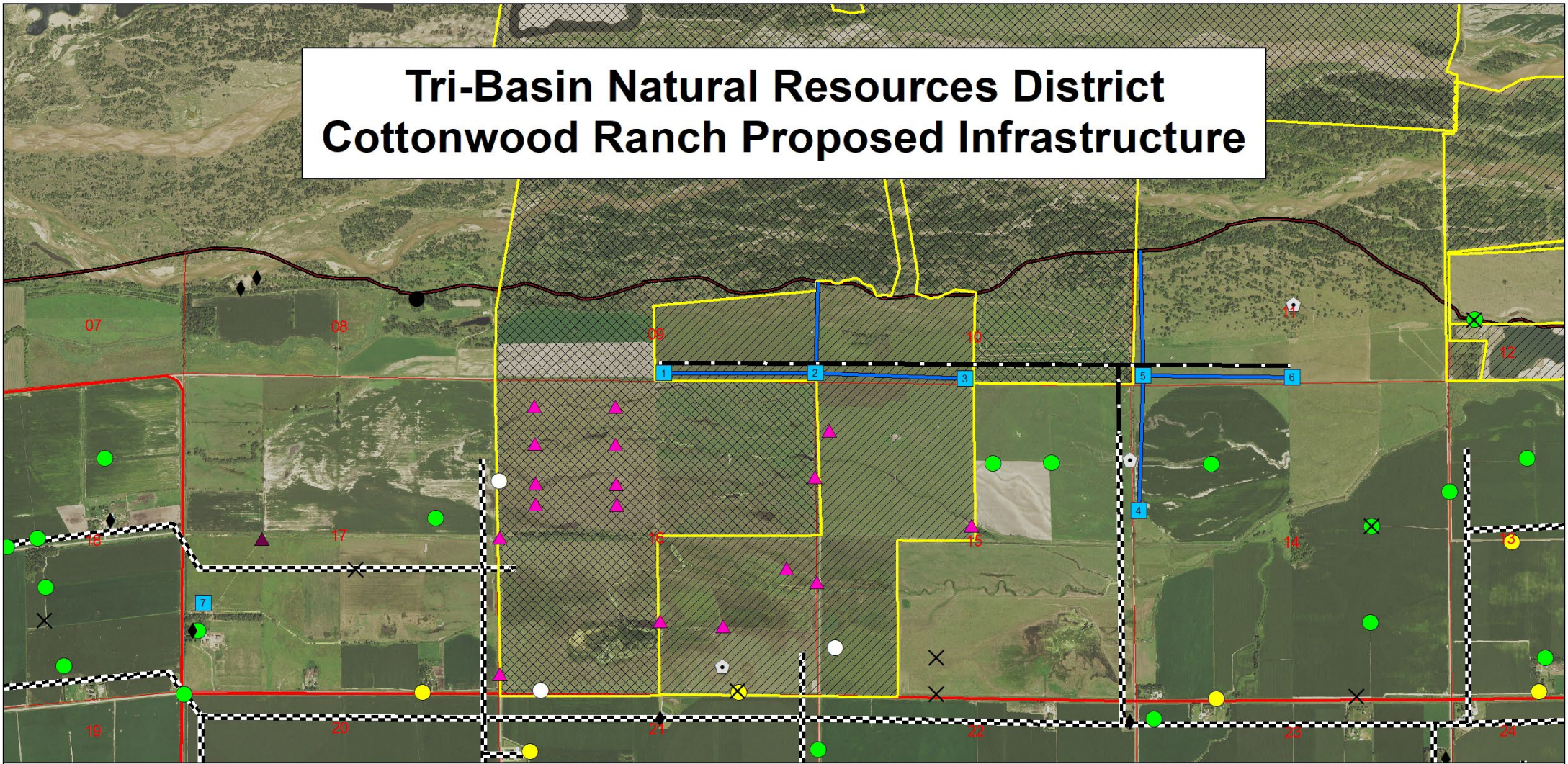


# Cottonwood Ranch Augmentation Project

- Second phase of intentional recharge project developed by PRRIP in NW Phelps County
- CNPPID buried a pipeline from Phelps County Canal to wet meadows, so excess flows could be diverted
- TBNRD drilled seven wells to re-time recharge into river, in cooperation with PRRIP
- 13,500' of pipeline to river
- Possible additional phases with up to twelve more wells



# Tri-Basin Natural Resources District Cottonwood Ranch Proposed Infrastructure



- ◆ Domestic, Active Registered Well
- ✕ Irrigation, Decommissioned Well
- ⬠ Livestock, Active Registered Well
- ▲ Monitoring (Ground Water Quality), Active Registered Well
- ▲ Observation (Ground Water Levels), Active Registered Well
- Other, Active Registered Well

- Proposed Well
- ▨ NPPD Property
- ▨ PRRIP Property
- Section
- Three-Phase Power
- Tri-Basin Paved Road

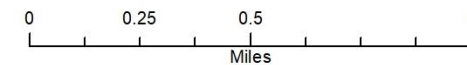
### Pumping Rate

- 0
- <1000
- 1001-1500
- >1501

### Spacing

- 600'
- 1320'
- 2640'

- Proposed Electrical 11,750'
- Proposed Pipeline 13,425'





















# Questions?

