South Platte River
Nebraska Perspective

September 12, 2023

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Nebraska Department of Natural Resources

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Nebraska Department of Natural Resources

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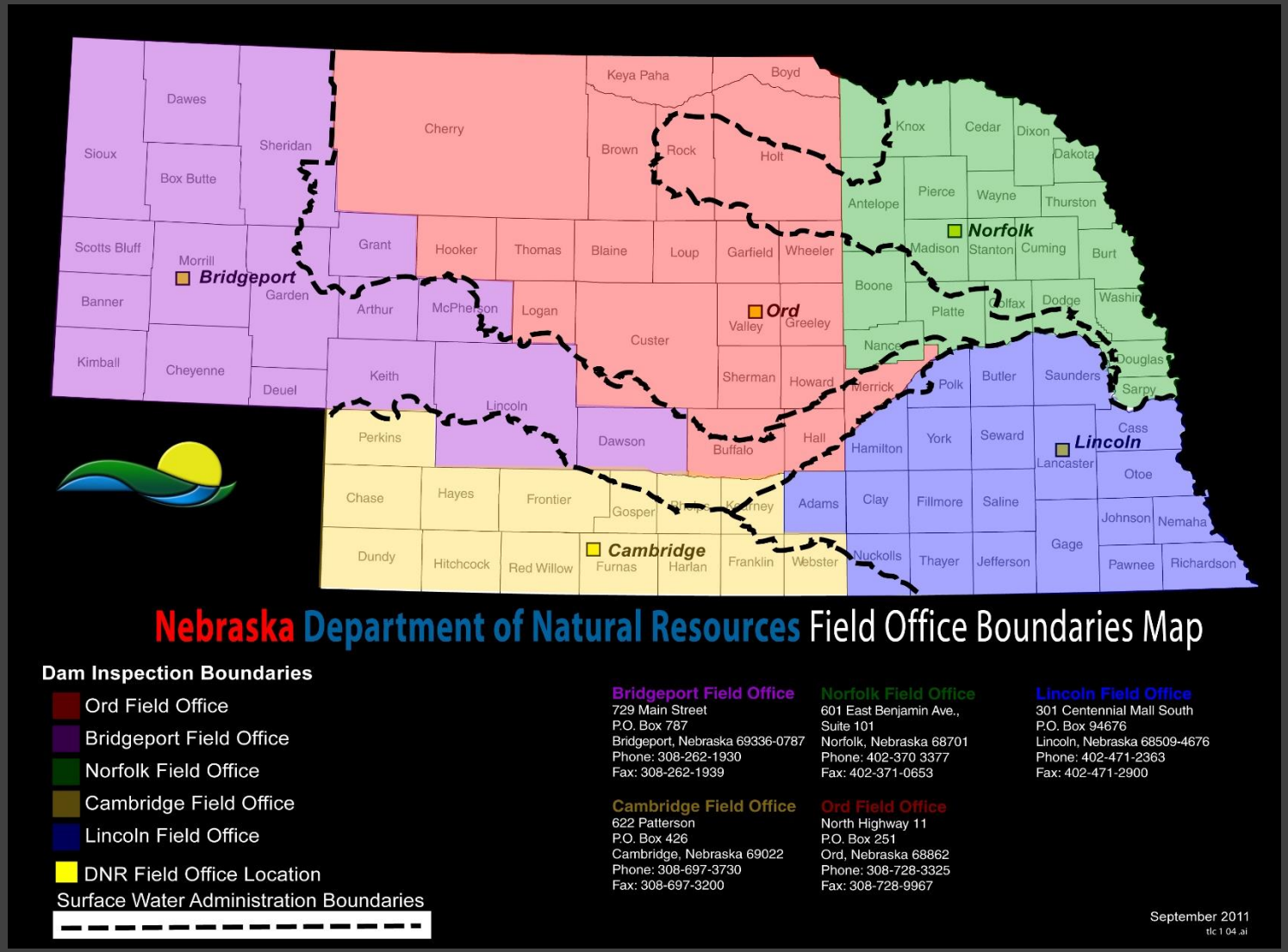
Providing the sound science and support for managing Nebraska's most precious resource.

NeDNR Water Administration Division

The Water Administration Division enforces state statutes to ensure the orderly distribution of surface water in Nebraska, and collects data related to the Department's mission.

- Twenty-eight full time staff members
- Five field offices, located in Bridgeport, Cambridge, Lincoln, Norfolk, and Ord.

NeDNR Water Administration Division



Nebraska Department of Natural Resources Field Office Boundaries Map

Dam Inspection Boundaries

- Ord Field Office
- Bridgeport Field Office
- Norfolk Field Office
- Cambridge Field Office
- Lincoln Field Office
- DNR Field Office Location

Surface Water Administration Boundaries

Bridgeport Field Office
729 Main Street
P.O. Box 787
Bridgeport, Nebraska 69336-0787
Phone: 308-262-1930
Fax: 308-262-1939

Norfolk Field Office
601 East Benjamin Ave.,
Suite 101
Norfolk, Nebraska 68701
Phone: 402-370 3377
Fax: 402-371-0653

Lincoln Field Office
301 Centennial Mall South
P.O. Box 94676
Lincoln, Nebraska 68509-4676
Phone: 402-471-2363
Fax: 402-471-2900

Cambridge Field Office
622 Patterson
P.O. Box 426
Cambridge, Nebraska 69022
Phone: 308-697-3730
Fax: 308-697-3200

Ord Field Office
North Highway 11
P.O. Box 251
Ord, Nebraska 68862
Phone: 308-728-3325
Fax: 308-728-9967

September 2011
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NeDNR Water Administration Division

Responsibilities

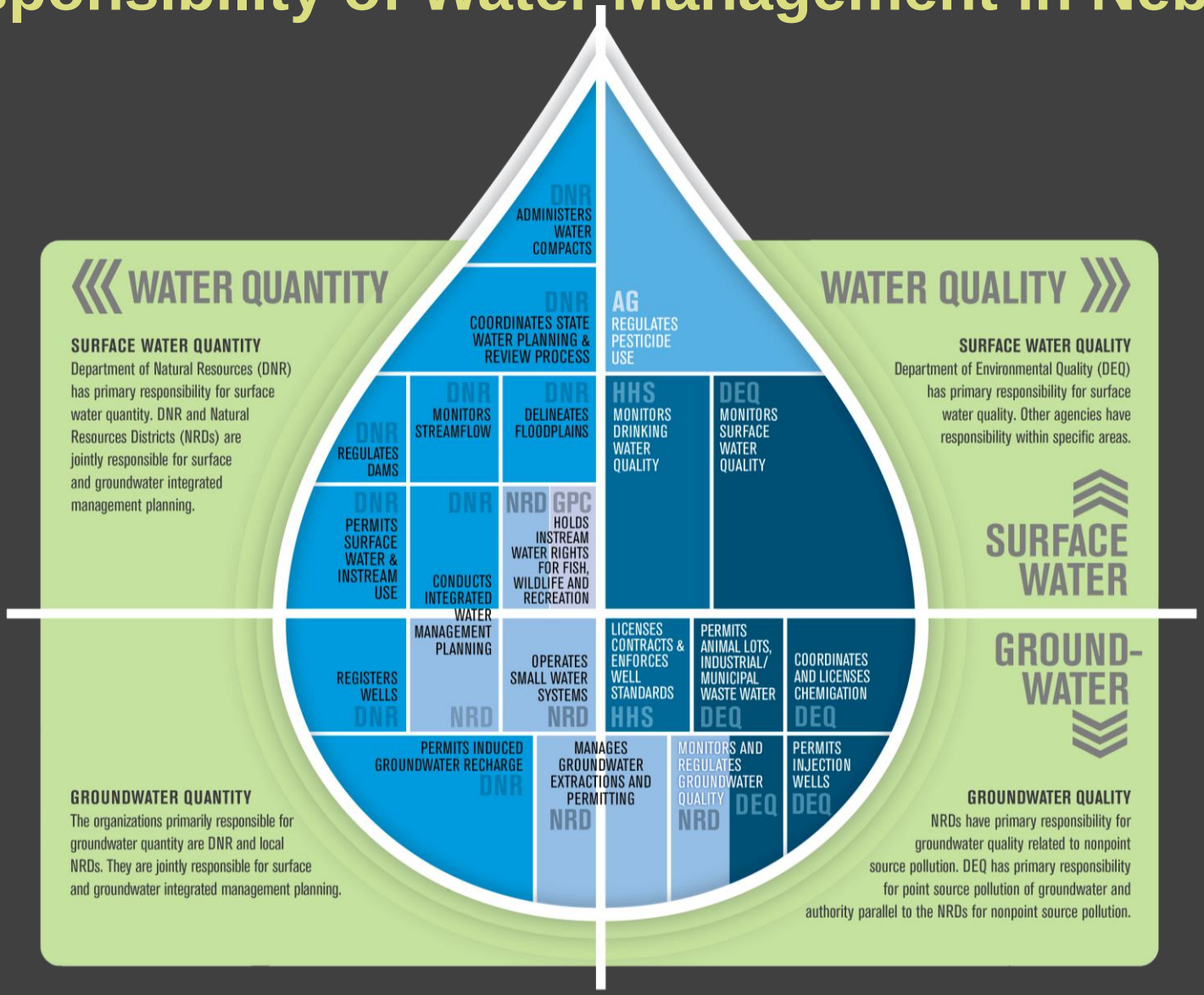
Water Administration

- Compacts and Decrees
- Local Shortages
- Enforcement
- Adjudication

Data Collection

- Streamgaging
- Survey
- Dam Safety Inspections
- Water Use Reporting
- Monitoring – Pump Checks

Responsibility of Water Management in Nebraska



Differences between Groundwater and Surface Water

Groundwater

- Managed by Natural Resource Districts
- Correlative Rights Doctrine - “Rule of Reasonable Use”
- If supply is insufficient, all users can be put on an allocation

Surface Water

- Managed by Nebraska Department of Natural Resources
- Prior Appropriation Doctrine - “First-in-time, First-in-Right”
- If the supply is insufficient, the junior appropriators are denied water.

Nebraska Department of Natural Resources

Location Map

State of Nebraska
River Basin and NRD Boundaries

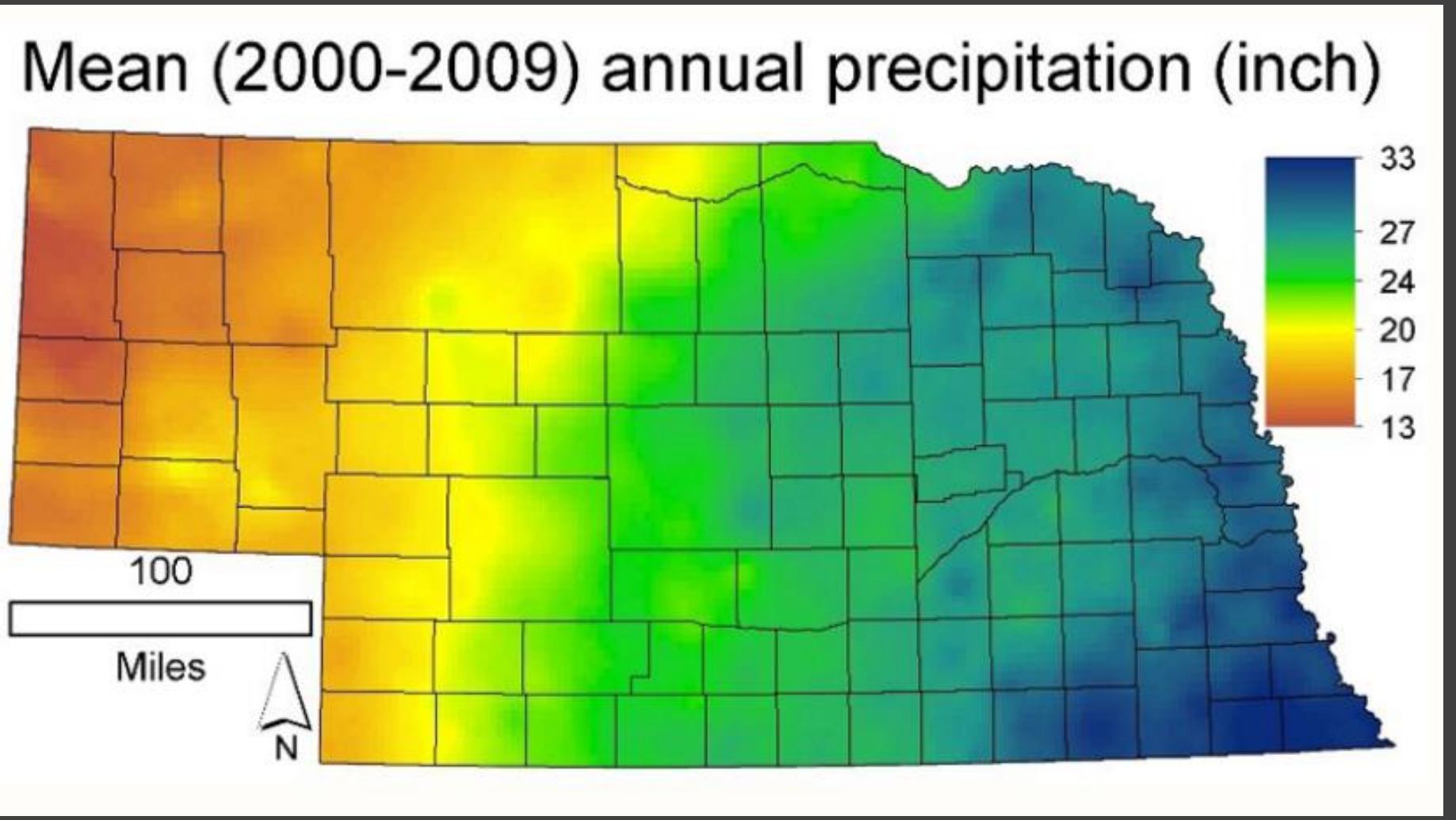
Miles
0 12.5 25 50 75 100

Data Bank

Information Source:
Produced by: Nebraska Department of Natural Resources
Topographic Data: Hydrologic Data, DNR, 2014
GIS Process: ArcGIS 10
Processed: Updated October, 2015

Legend
- NRD Boundaries
- River Basin Boundaries

White-Hat
UPPER NIOBRARA WHITE
MIDDLE NIOBRARA
Niobrara
LOWER NIOBRARA
LEWIS AND CLARK
Missouri Tributaries
UPPER ELKHORN
Elkhorn
LOWER ELKHORN
UPPER LOUP
Loup
LOWER LOUP
NORTH PLATTE
North Platte
PAPIO-MISSOURI
LOWER PLATTE NORTH
SOUTH PLATTE
South Platte
TWIN PLATTE
Lower Platte
LOWER PLATTE SOUTH
CENTRAL PLATTE
Middle Platte
UPPER BIG BLUE
Big Blue
UPPER REPUBLICAN
MIDDLE REPUBLICAN
Republican
TRI-BASIN
LOWER BIG BLUE
Nemaha
Little Blue
NEMAHA
LOWER REPUBLICAN
LITTLE BLUE



Mean annual precipitation (P) distribution over Nebraska. The south-eastern corner receives two-and-a-half times as much precipitation a year in general as the north-western panhandle region.

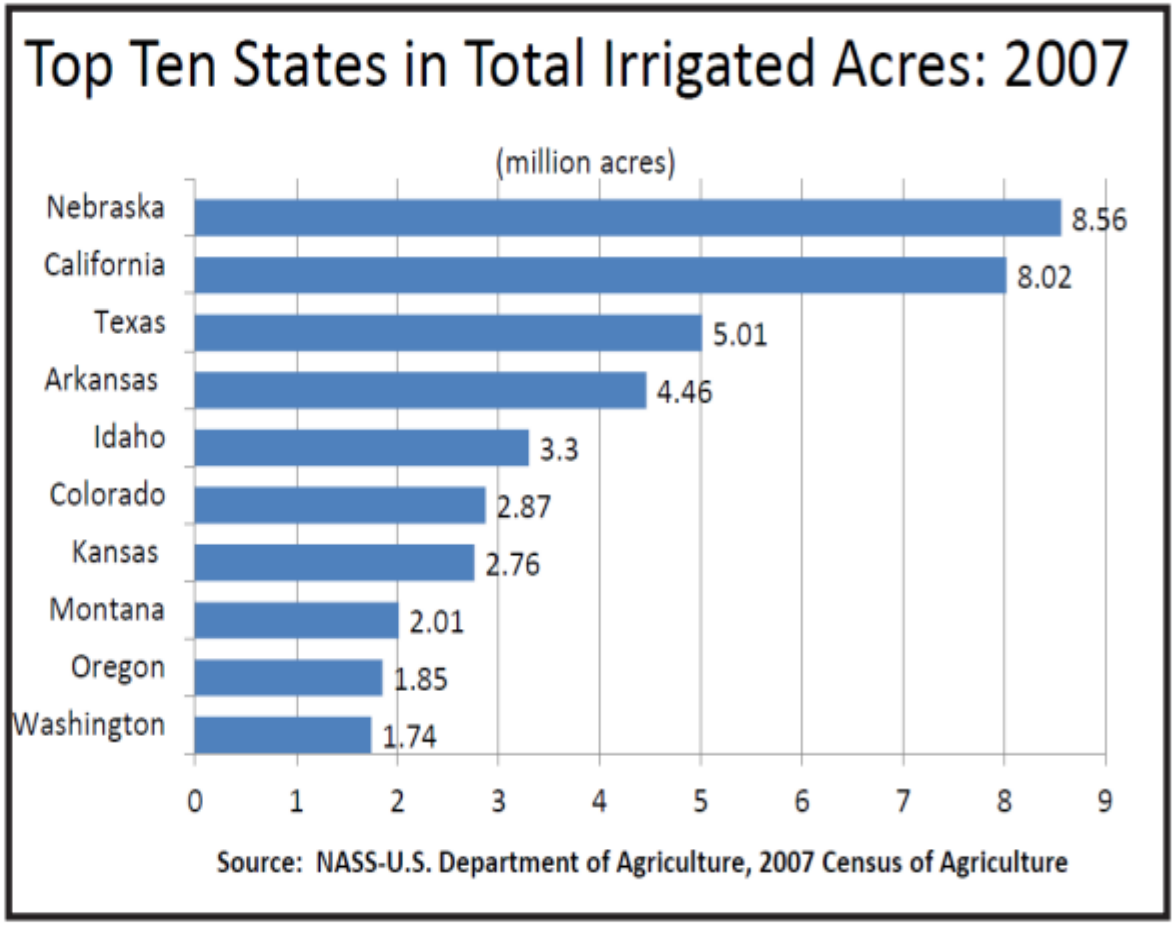
Source: http://www.prism.oregonstate.edu/

As of 2007, Nebraska had 8.56 million irrigated acres.

Between the 2002 and 2007 agricultural census years, Nebraska's irrigated base expanded by 934,000 acres, moving it ahead of California which experienced a decline of 693,000 acres.

Of approximately 55 million acres under irrigation nationally, about 15% are located in Nebraska.

About three out of eight cropland acres in Nebraska are under irrigation.

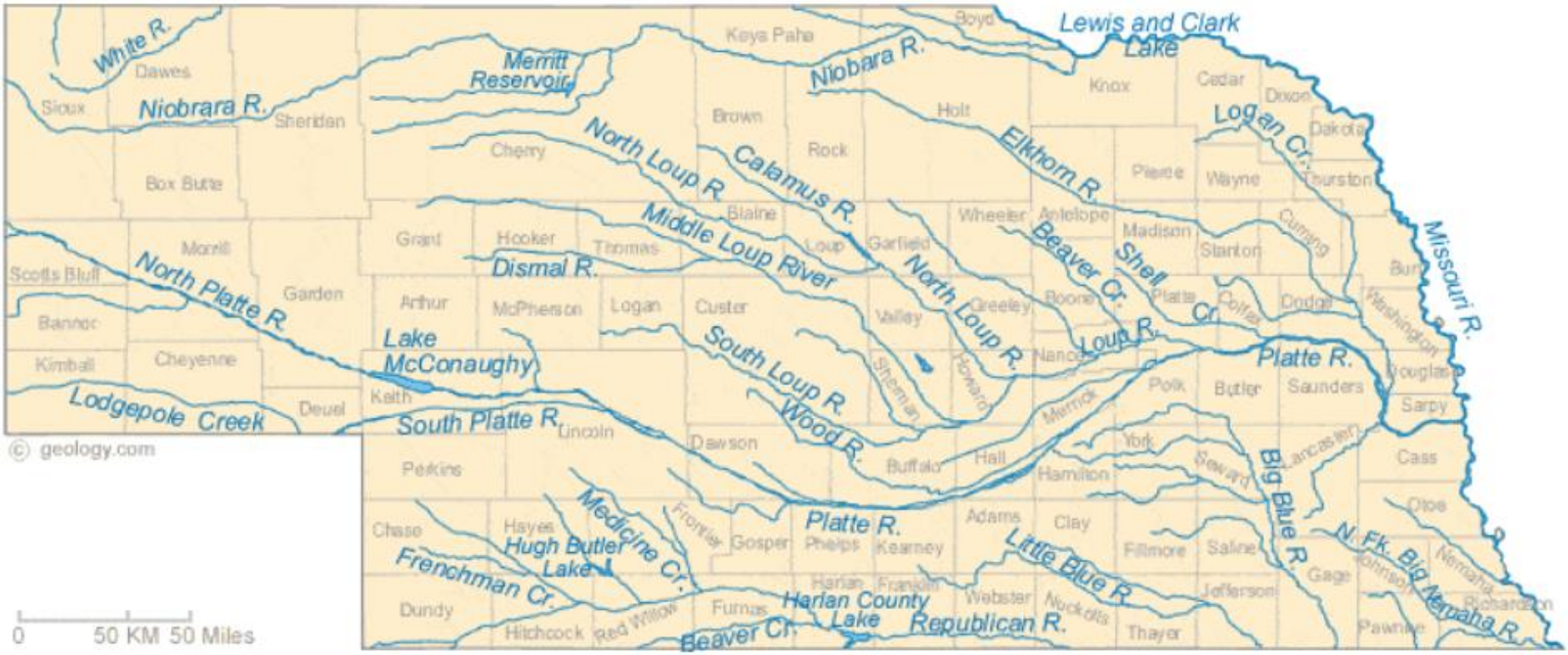


South Platte NRD – 10,312 Surface Water Acres 132,894 Groundwater Acres

NRDs below North Platte Confluence – 255,530 Surface Water Acres 1,386,203 Groundwater Acres

Twin Plate, Tri-Basin, Central Platte

Nebraska Lakes, Rivers and Water Resources



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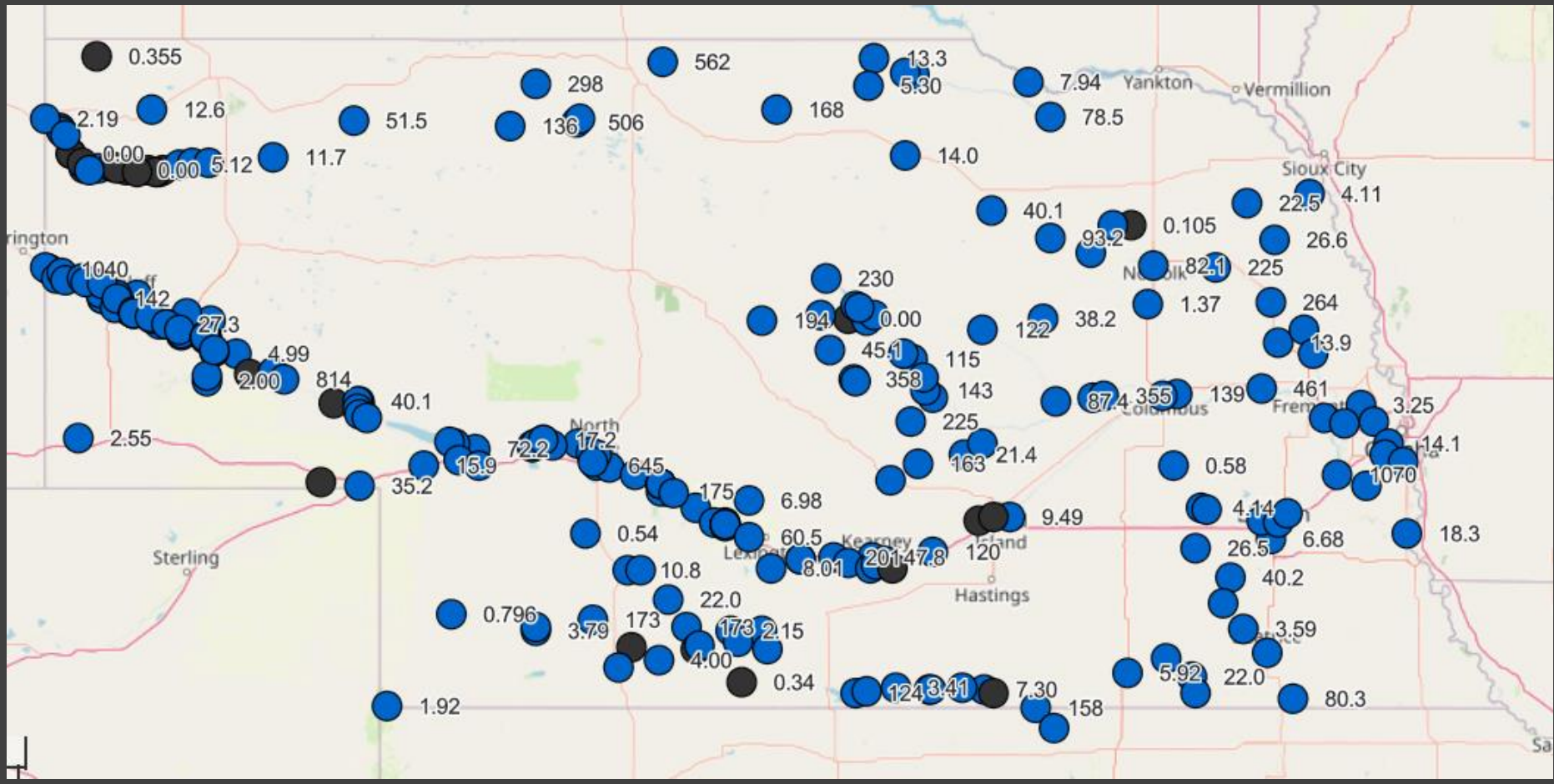
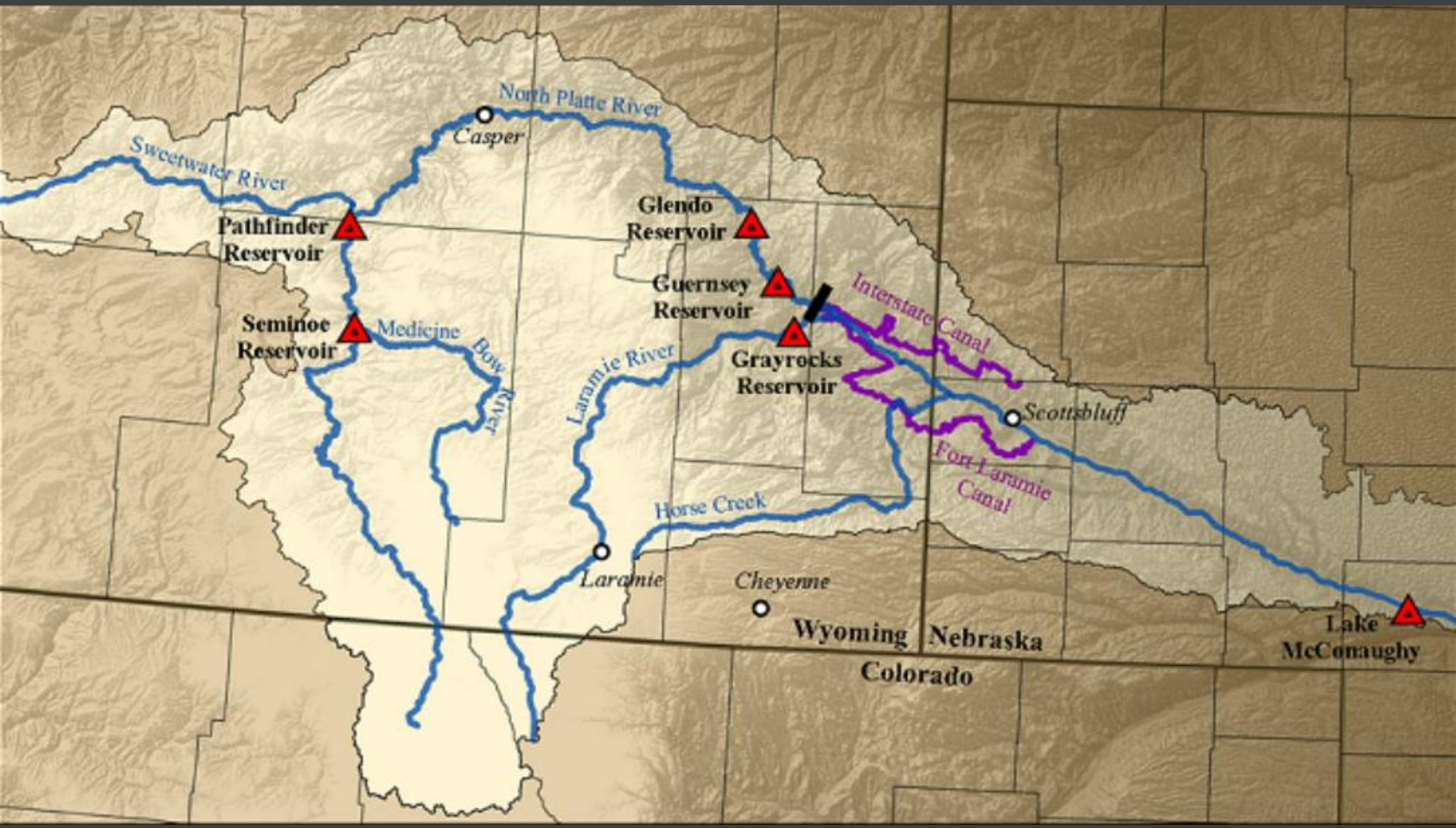
NeDNR Real Time Water



https://nednr.aquaticinformatics.net/Data/Map/Parameter/Discharge/Statistic/LATESTDISCHARGE/Interval/Latest

North Platte



Platte River Management

- North Platte Decree
- Platte Water Accounting Program
- Platte River Recovery Implementation Program
- Integrated Management Plans NeDNR and Natural Resources Districts.

North Platte Decree

- In 1945 The Supreme Court ruled that Wyoming could irrigate up to 168,000 acres. Natural flow split at the state line 25% to Wyoming and 75% to Nebraska.
- Established allocations of storage water
- Capped consumptive use
- Detailed cooperative management actions between Wyoming, Nebraska, Colorado, and USBR
- Modified in 2001

Platte Water Accounting Program (PWAP)

- PWAP assembles data from all pertinent sources
  - USBR
  - Wyoming
  - Colorado
  - Irrigation Districts
  - NeDNR Streamgaging Program
  - USGS
- Analyzes inputs and outputs; gains and losses, along the Platte River though 15 reaches
- PWAP is a tool that assists with apportioning natural flow and tracking Storage and Environmental Account water

PWAP Lower Apportionment

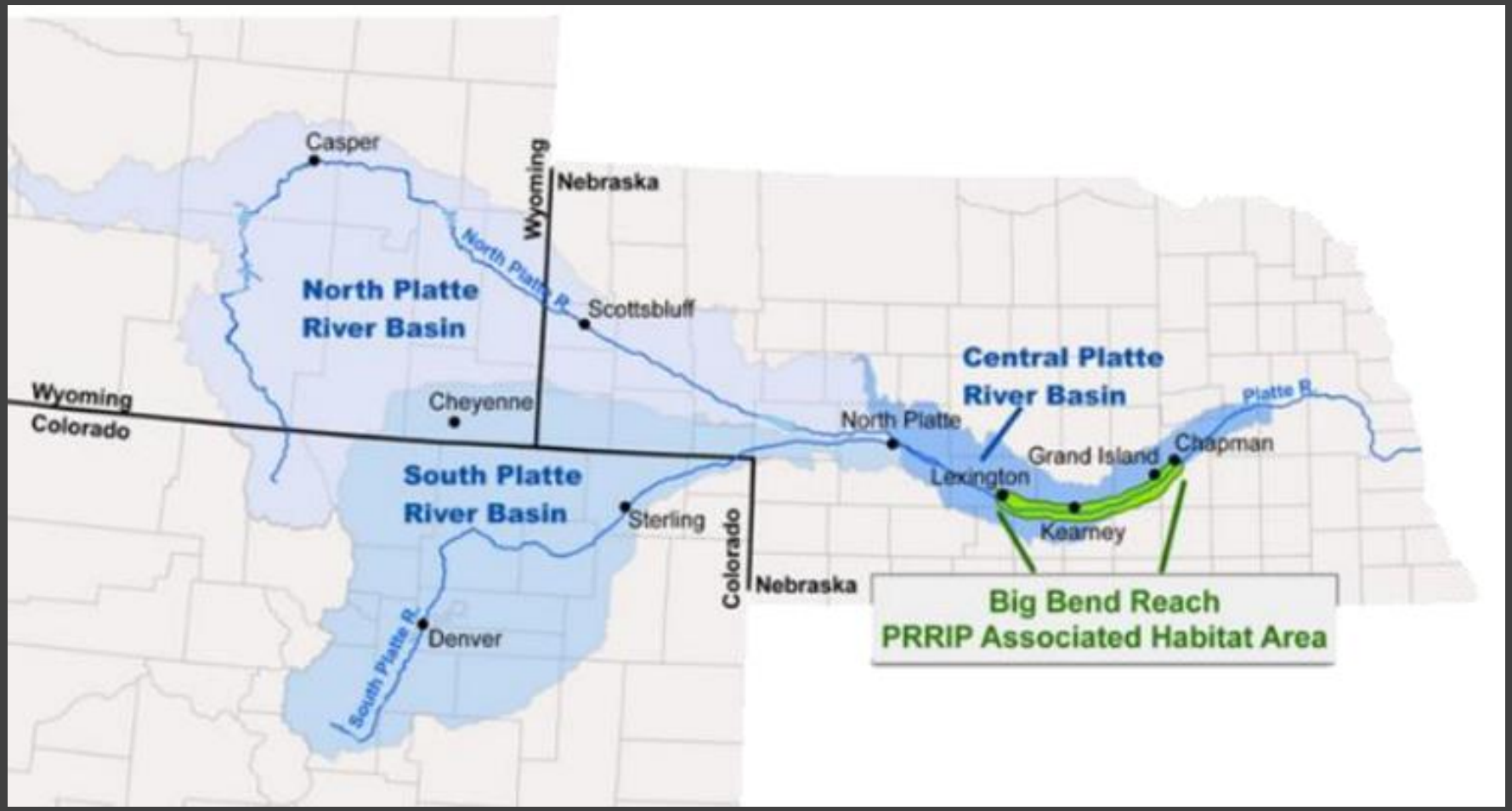
Kingsley Dam to Kearney

24 Hour Average for 9/4/2023

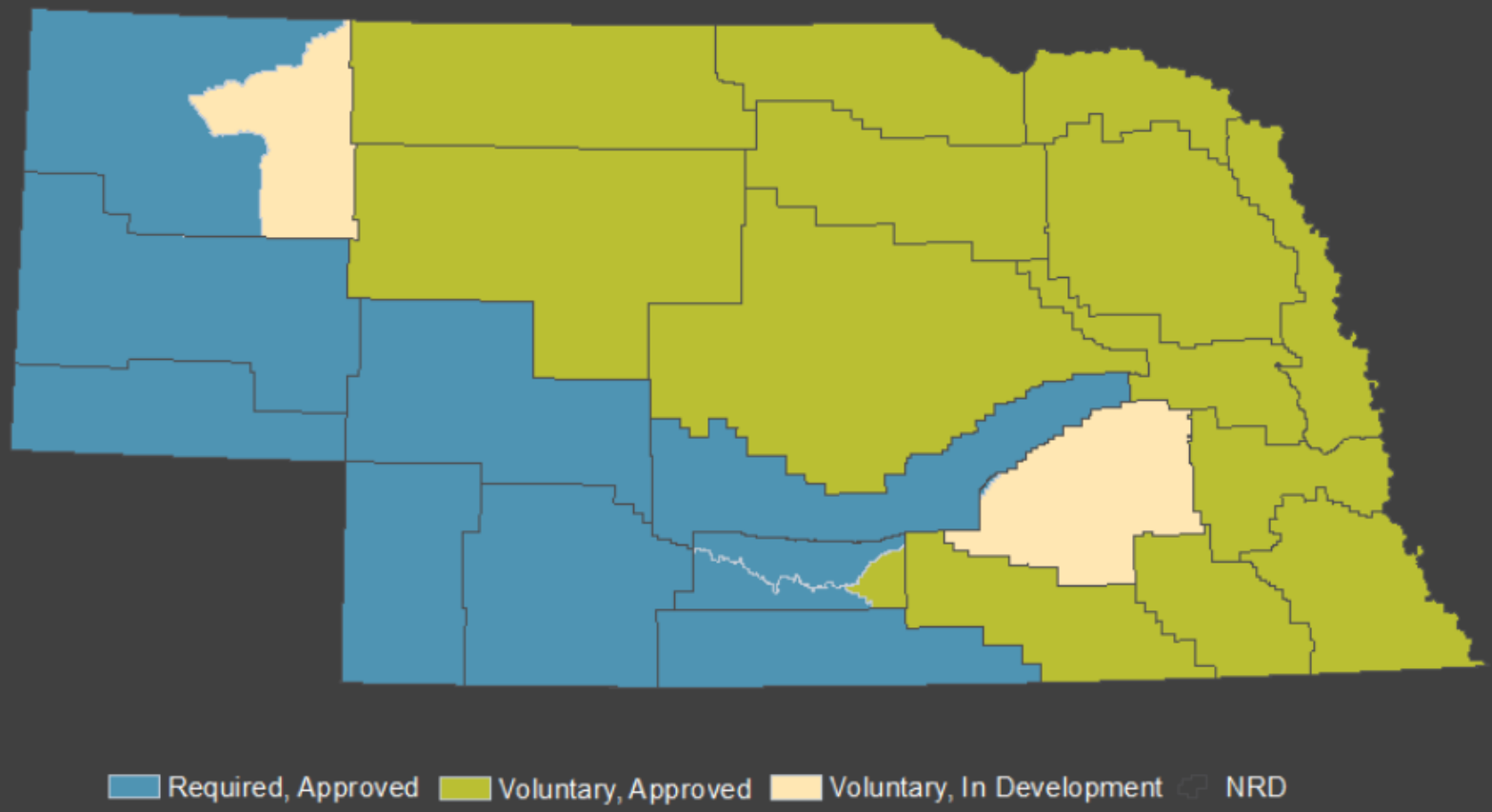
	cfs					Cumulative Storage Acre-Feet
	EA	Storage	Natural	Total		
**	0	2295	623	2919		Total Kingsley Outflow
	0	1052	623	1675		North Platte River at Keystone
	0	972	272	1244		North Platte River at Sutherland
	0	682	21	703		Sutherland Power Return
	0	0	63	63		Platte River at Maxwell
	0	220	509	729	***	Jeffrey Power Return
	0	10	75	85		Platte River at Darr
	0	0	0	0		Johnson Power Return
	0	0	132	132		Platte River near Overton
	0	0	55	55		Platte River at Kearney
	0	0	19	19		Platte River at Grand Island

						Cumulative Diversion - Acre-Feet	
	EA	Storage	Natural	Total	District	Natural	Storage
**	0	0	19	19	Lisco Canal	3153	0
	0	1244	0	1244	Sutherland Div - NPR	168008	116682
**	0	0	196	196	North Platte Canal	32368	508
**	0	0	72	72	K and L Canal	10405	0
**	0	0	89	89	Paxton - Hershey Canal	14594	0
**	0	0	66	66	Suburban Canal	11164	219
**	0	1545	572	2117	Tri-County Diversion	656747	98535
	0	0	0	0	Thirty Mile Siphon	0	0
	0	28	229	257	Gothenburg Canal	46473	1580
	0	0	296	296	Dawson County Canal	55682	0
	0	0	0	0	Six Mile Canal	0	0
	0	73	39	112	Cozad Canal	13313	6184
	0	17	24	41	Orchard-Alfalfa Canal	5711	1891
	0	87	59	146	Thirty Mile Canal	17761	9286
	0	0	161	161	Kearney Power and Irr.	64458	0
	0	2994	1820	4814	Total Diversions		

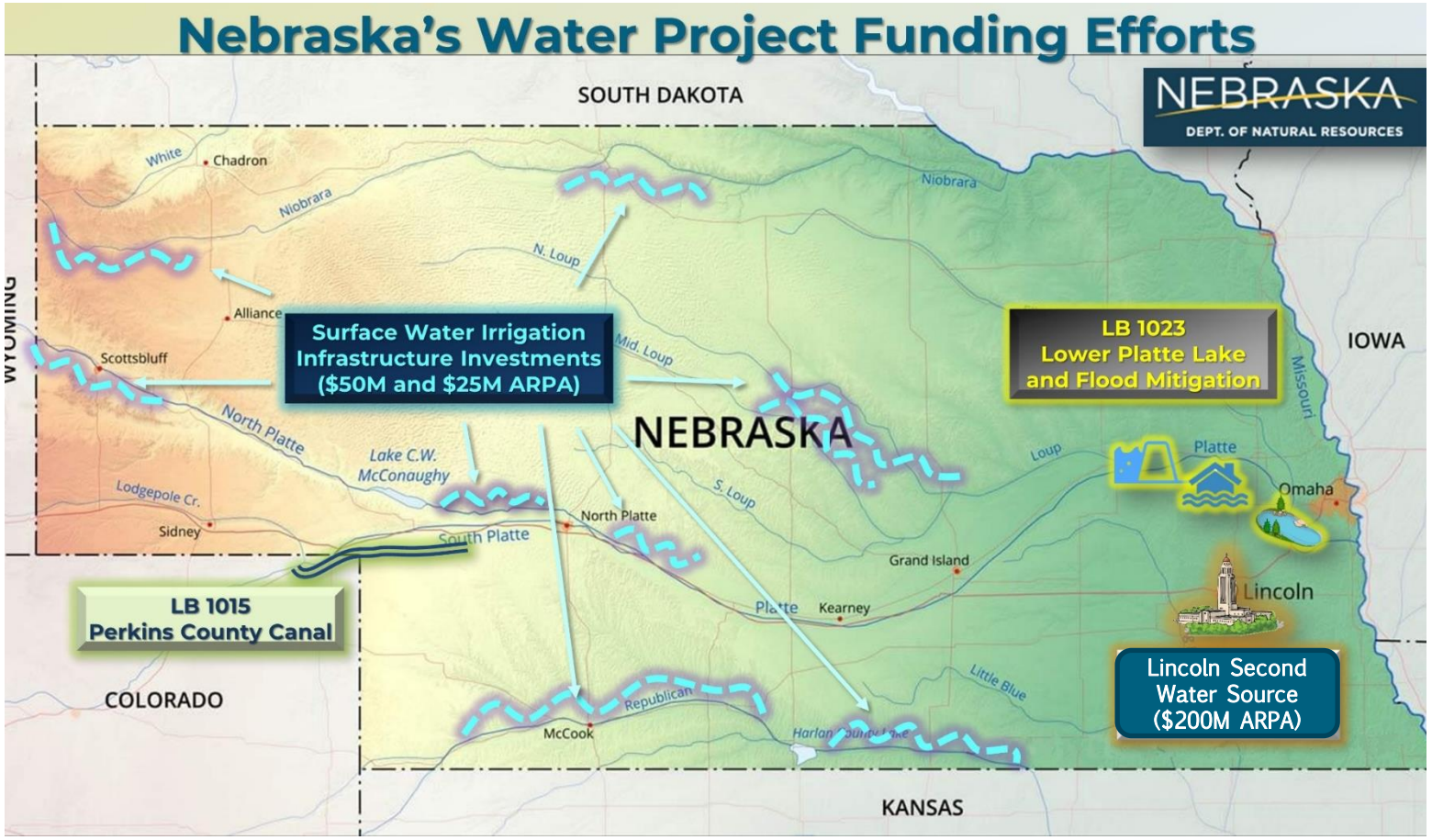
Platte River Recovery Implementation Program PRRIP



Integrated Management Plan Areas – nested tiers

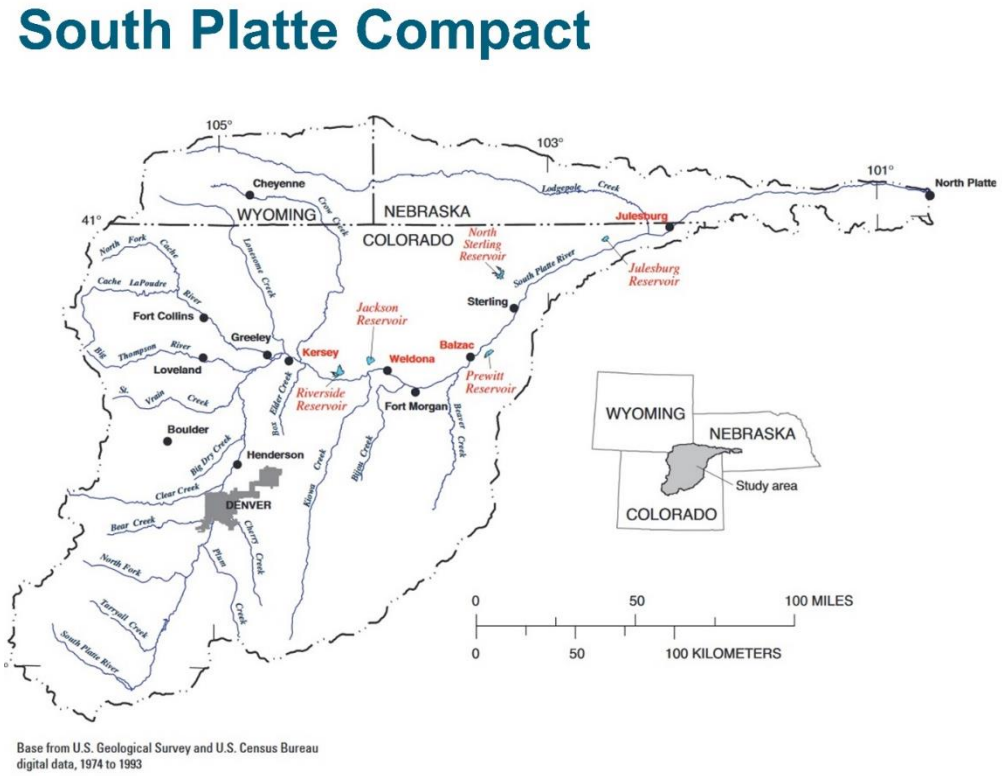


Nebraska's Water Project Funding Efforts



Perkins County Canal Project

- Nebraska provided all rights necessary to construct canal
- Canal provided a 1921 priority date for administration in CO
- NE provided net future flow after a reservation for then present senior diversions in CO and a future 35KAF
- NE can use canal to divert surplus water during the irrigation season



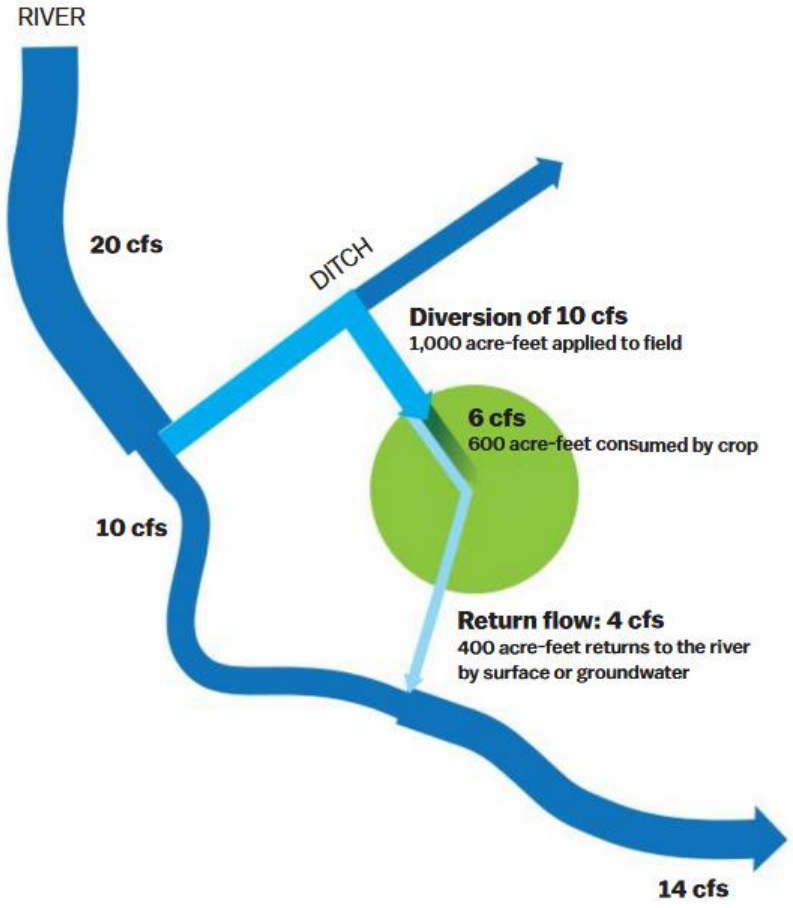
South Platte River Return Flows

Dynamics of a Return Flow

Return flow is surface water or groundwater that returns back to rivers or shallow aquifers after being applied to beneficial use. In most irrigation systems, crops consume a portion of the water applied and unused water becomes a return flow.

In many places in Colorado, return flows make their way back to the river only to be diverted and return to the river again before finally exiting the state. Downstream water users depend on these return flows to fulfill their water rights. For this reason, when an agricultural water right is sold and transferred to another beneficial use, the future consumption of that water is limited to the beneficial historical consumptive use of the original water right.

In this example, an agricultural diversion takes 10 cubic feet per second. The irrigator applies that water to their crop, but the crop consumes only 60 percent. The remaining water will eventually make its way back to the river and can be diverted and used by downstream water users—assuming it's not lost to evaporation, is not intercepted by plants, and does not infiltrate into the aquifer.

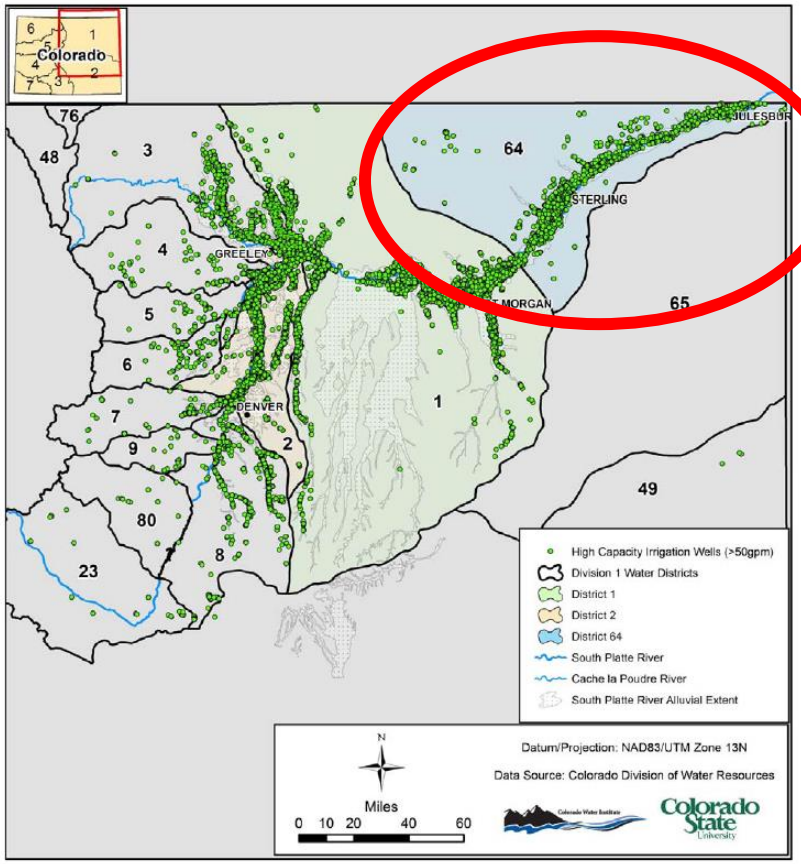


SOURCE: Colorado Division of Water Resources

Timeline

- Pre-2016—Nebraska Water Users/Stakeholders
- 2016—CO Legislature Adopts HB16-1256. “Excess flows” to NE
- 2017—Report published. 300,000 AF “Excess flow” Leaving CO
- 2019—NE Legislature Provides funds to DNR for detailed evaluations of CO plans
- 2019—Colorado River Drought Contingency plan places more pressure on SP
- 2021—CO Basin Implementation Plan. Accelerating $10B to take “Excess Flows”
- 2022—NE Governor and Speaker announce plans for Canal to exercise water right
- 2022—NE Legislature passes LB1015 and LB1012 (initial funding)
- 2022—Independent Study Submitted to the Legislature December 2023
- 2023—Engaged Consultant for Design and Permitting
- 2023- Full Funding allocated by Nebraska Legislature ($628M)

Water Management in Colorado's South Platte

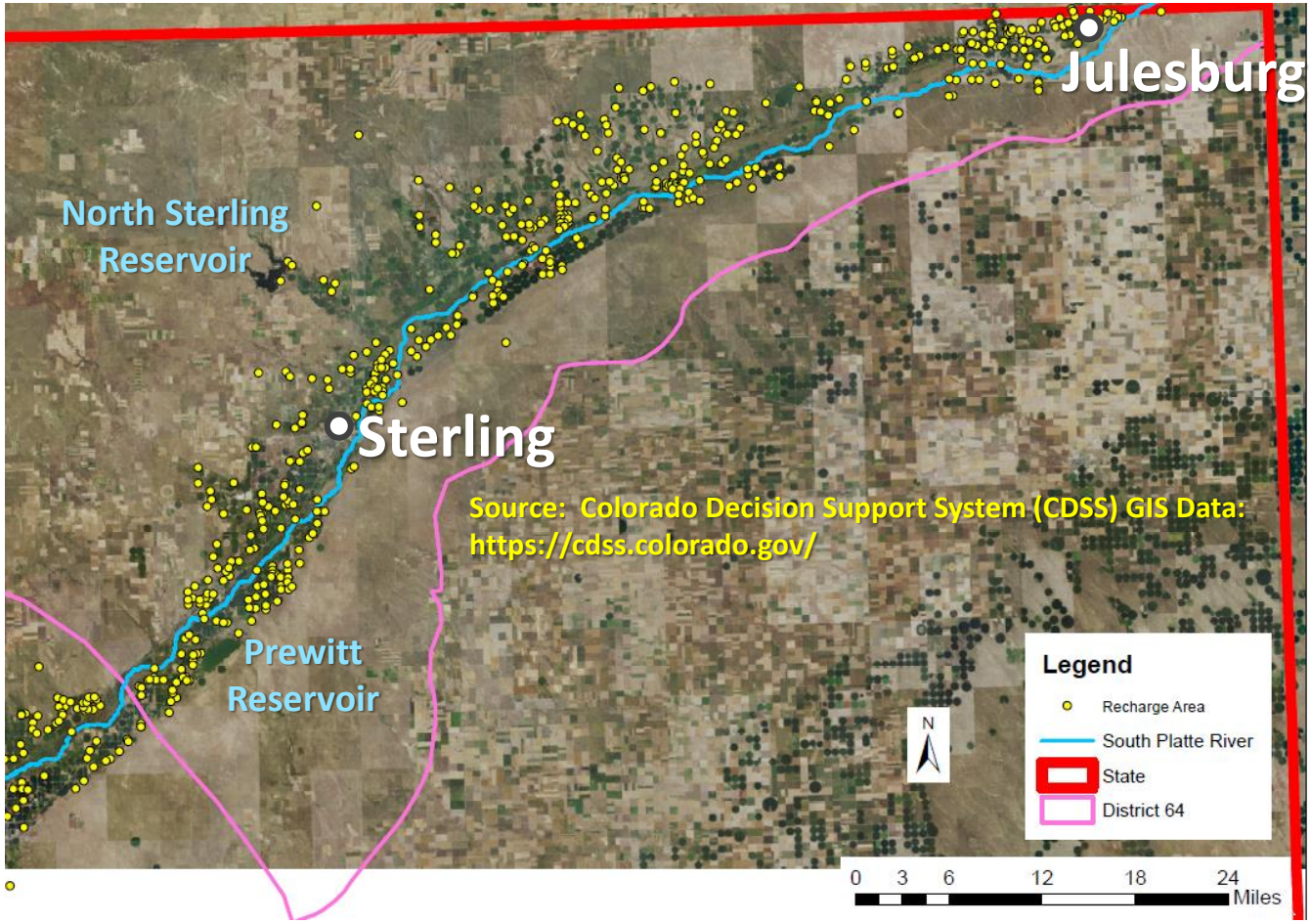


Map 3. High Capacity Wells in the S. Platte Alluvial Aquifer.
Data Source: CO DWR HydroBase Version 20130710

- Around 944 High Capacity Irrigation Wells in Lower Section (Water District 64) as of 2010
- Over 110,000 acre-feet/year of Groundwater Pumping in Lower section

Source of Map and Data: Report to the Colorado Legislature, HB12-1278 Study of the South Platte River Alluvial Aquifer, December 31, 2013

Recharge Areas in Lower Section (Water District 64)



- Around 500 recharge projects currently (Source Colorado CDSS, 2022)
- Recharge augmentation about 92,000 acre-feet/year 2008-2012 (HB12-1278 Report to Colorado Legislature 2013)

“Junior” Non-Irrigation Season Diversions in Colorado

~30 kAF

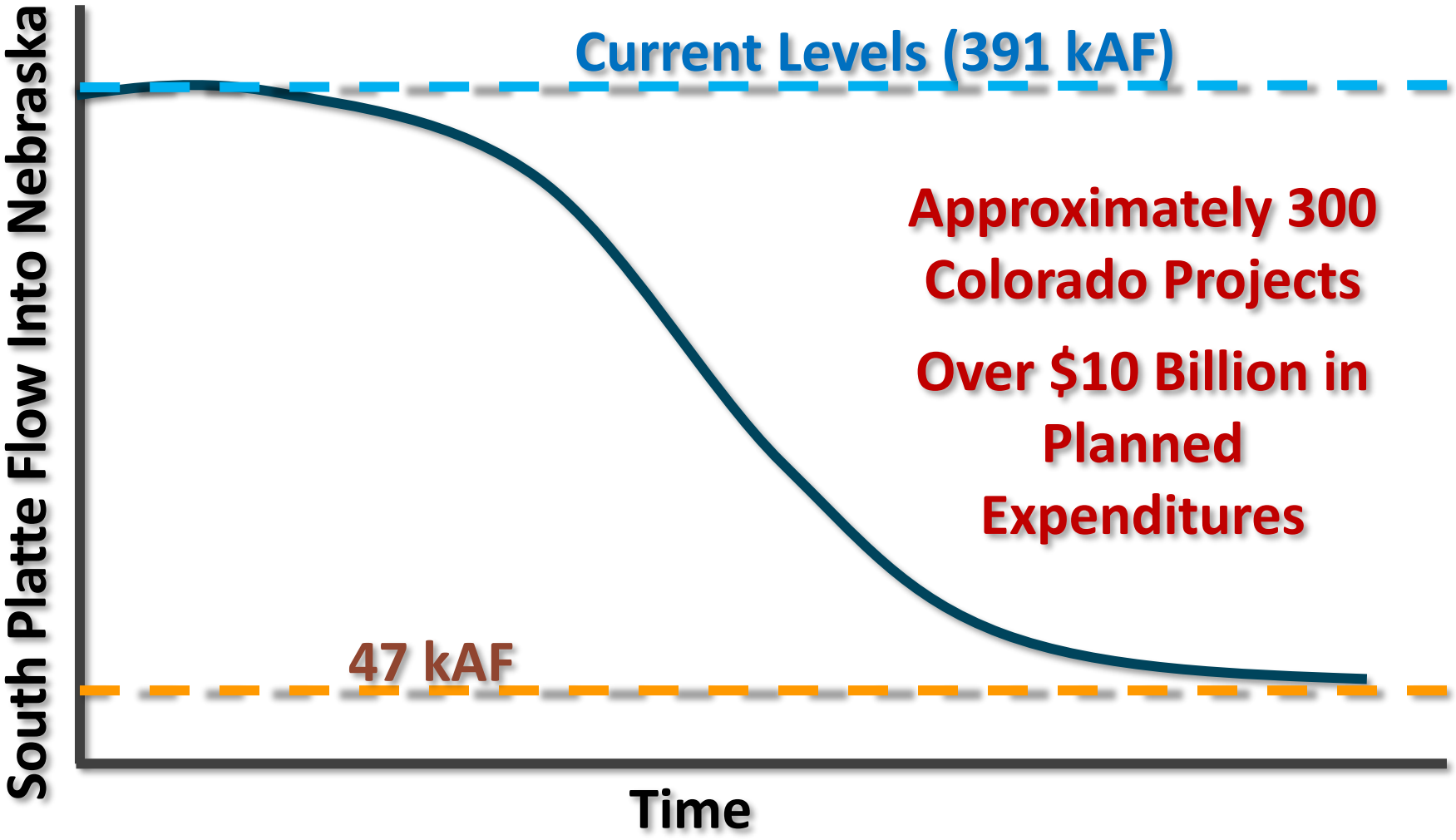
~60 kAF

Irrigation Well Depletions

Recharge Diversions

~90 kAF
Combined

~270 cfs
Diversions Junior to Article VI Call


South Platte Flow Into Nebraska
Current Levels (391 kAF)
Approximately 300 Colorado Projects
Over $10 Billion in Planned Expenditures
47 kAF
Time

SPROWG Proposal

50,000 AF Firm Yield

Storage:

Henderson	50,000 AF
Kersey	100,000 AF
Balzac	25,000 AF

Total Cost $1.655 to Over $2.439 Billion

Source: Brown and Caldwell, May, 2019 Informational SPROWG Presentation

Example of Colorado Project

Platte Valley Water Partnership — Pioneering a Collaborative and Sustainable Water Future

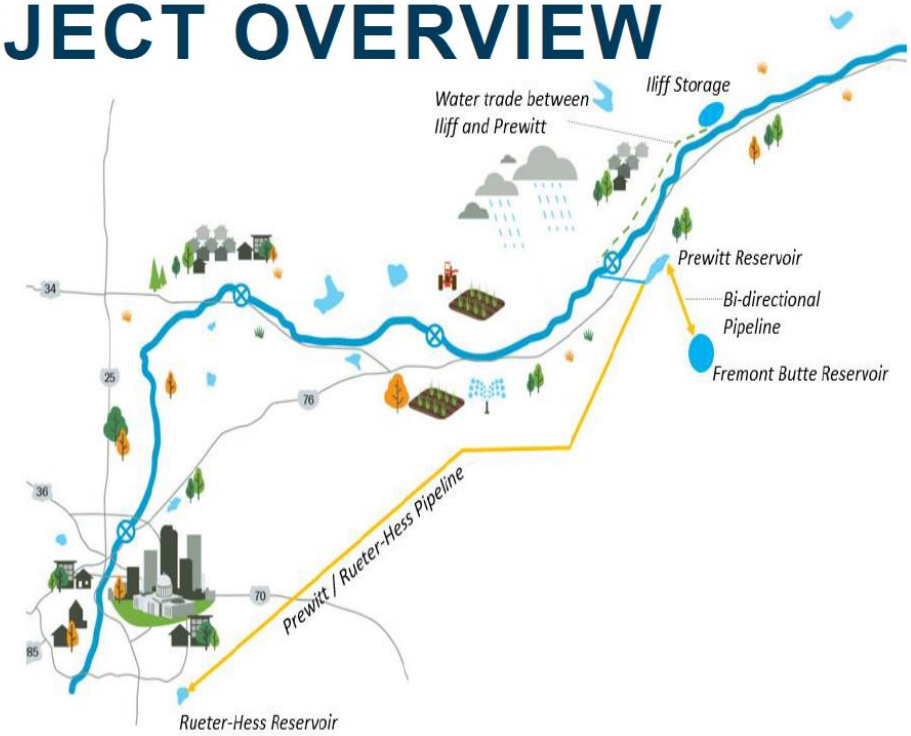
PROJECT OVERVIEW

Iliff Reservoir – 6,500 ac-ft

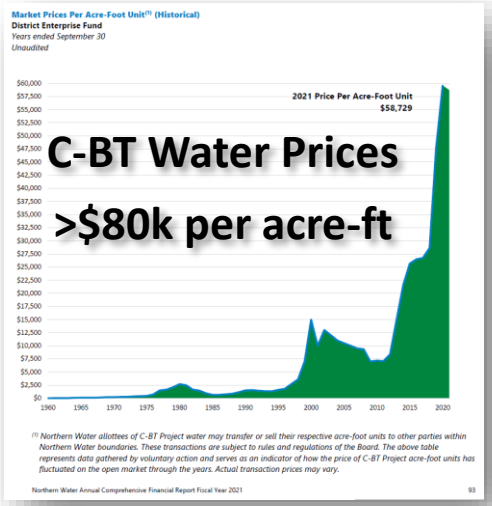
Prewitt Reservoir – 6,500 ac-ft forebay utilizing existing infrastructure

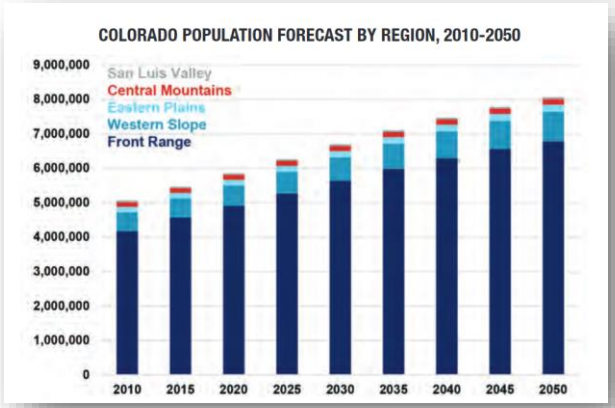
Trade between Iliff and Prewitt Reservoirs.

Fremont Butte Reservoir – 72,000 ac-ft, up to 250 cfs pumped and piped from Prewitt Reservoir (Phase II).



Colorado Actions

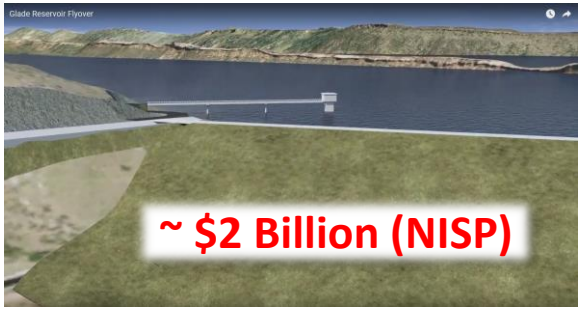




2020 Colorado State Demography Office

Chimney Hollow Construction
350 ft tall dam, 90,000 acre-ft

Lake Mead – Colorado River



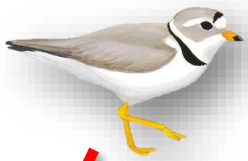
Glade Reservoir (Part of NISP)
170,000 acre-ft

No Canal, No Protection…

To the extent your letter requests administration of junior water appropriations in the Lower Section, I must also deny your request. Article VI, paragraph 2, provides that *the canal* may divert the net flow "which may remain after supplying all appropriations from the Lower Section perfected prior to the seventeenth day of December, 1921, and after supplying the additional future appropriations in the Lower Section for the benefit of which a prior and preferred use of thirty-five thousand acre-feet is reserved" for Colorado, among additional limitations in the Compact. Because Nebraska has not constructed the Perkins County Canal, there is no basis for Colorado to administer junior water appropriations in the Lower Section

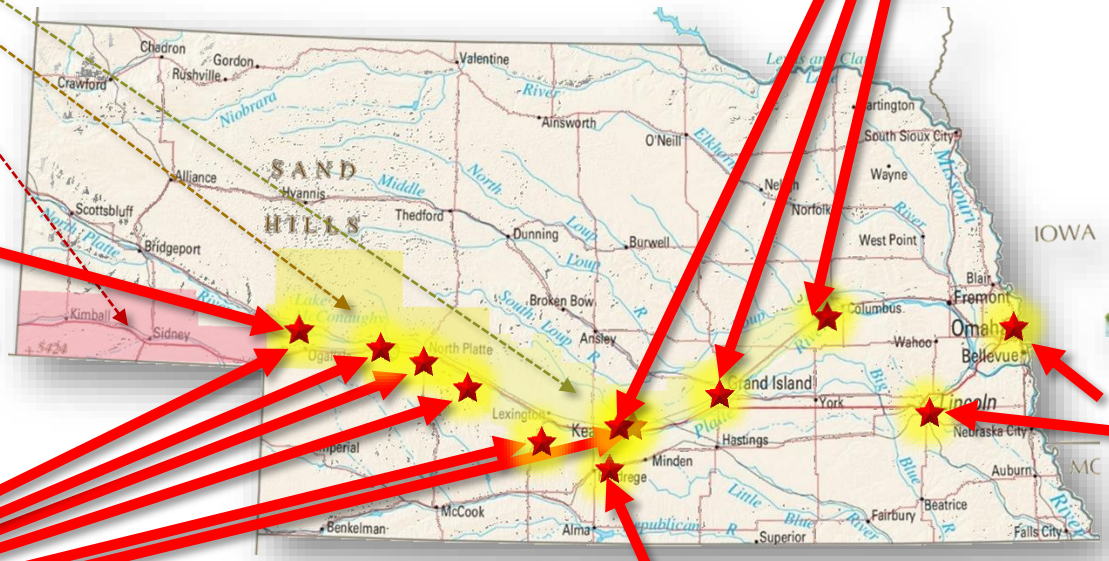
1313 Sherman Street, Room 821, Denver, CO 80203 P 303.866.3581 dwr.colorado.gov
Jared S. Polis, Governor | Dan Gibbs, Executive Director | Kevin G. Rein, State Engineer/Director

SPNRD, TPNRD, CPNRD, and other Natural Resources Districts

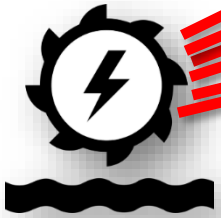


Environmental Flows (PRRIP, Instream Flows)

Lake McConaughy Operations



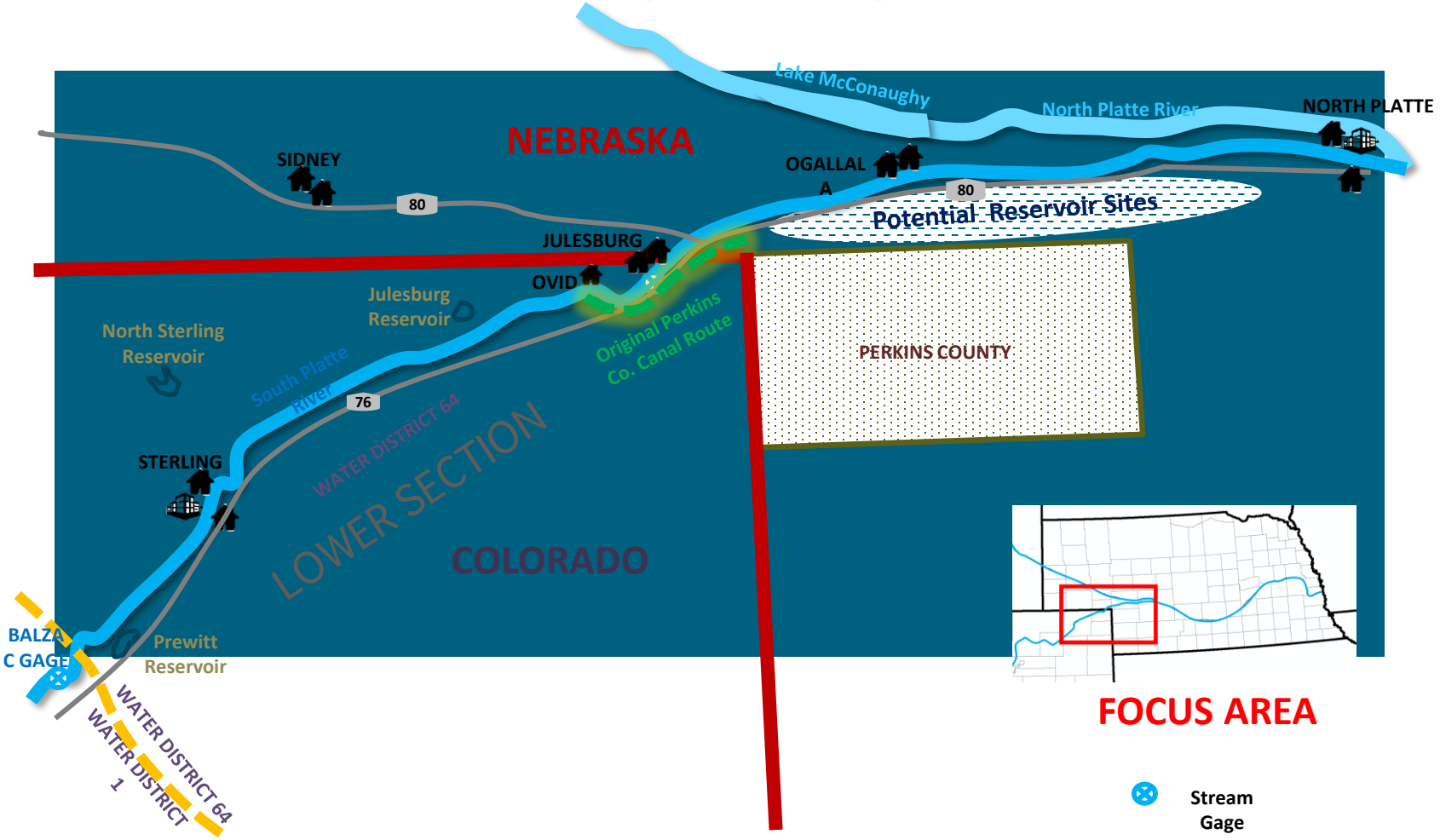
Municipal Supplies (Lincoln, Omaha, Others)

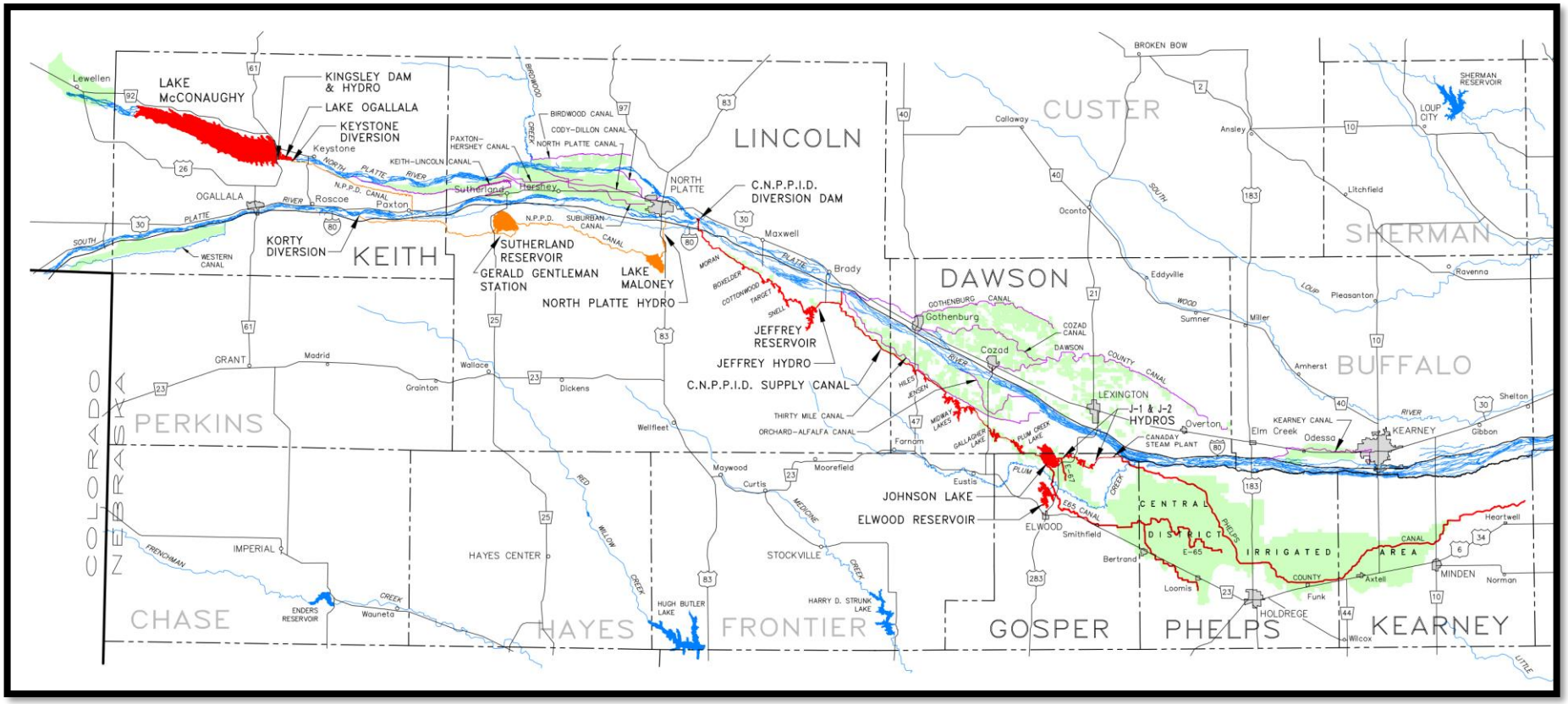


Hydropower and Power Plant Cooling

Agricultural Water Use and Costs (throughout basin)

Perkins County Canal Project Area




LAKE McCONAUGHY
KINGSLEY DAM & HYDRO
LAKE OGALLALA
KEYSTONE DIVERSION
KORTY DIVERSION
SUTHERLAND RESERVOIR
GERALD GENTLEMAN STATION
LAKE MALONEY
NORTH PLATTE HYDRO
C.N.P.P.I.D. DIVERSION DAM
JEFFREY RESERVOIR
JEFFREY HYDRO
C.N.P.P.I.D. SUPPLY CANAL
J-1 & J-2 HYDROS
JOHNSON LAKE
ELWOOD RESERVOIR
ENDERS RESERVOIR
HUGH BUTLER LAKE
HARRY D. STRUNK LAKE
CANADAY STEAM PLANT
CENTRAL DISTRICT IRRIGATED AREA
COLORADO
NEBRASKA
KEITH
LINCOLN
DAWSON
CUSTER
SHERMAN
BUFFALO
PERKINS
CHASE
HAYES
FRONTIER
GOSPER
PHELPS
KEARNEY

Perkins County Canal Project
Next Steps:

- Permitting
  - Pre-consultation with USACE/USFWS
  - Continue conversations with Colorado
  - Continue discussions with PRRIP
  - Discuss with NGPC
- Design
  - Continue to advance design concepts
  - Identify potential storage needs
  - Evaluate approaches to optimize water user outcomes
- Land Acquisition
  - Landowner meetings for potential diversion sites and canal route in Colorado
  - Begin executing land purchases for canal route

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