Lower Platte North NRD Integrated Management Plan 2024 Annual Report

August 28 @ 6:00pm
LPNNRD Office, Wahoo, NE

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LOWER PLATTE NORTH
Natural Resources District

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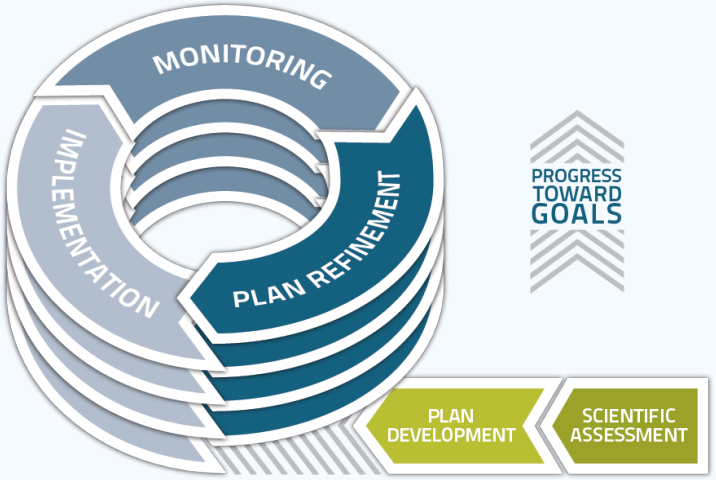
Purpose

- IMP Process
- Surface and Groundwater Data Collection and Monitoring
  - NeDNR and LPNNRD
- Consortium Plan Implementation
- Action Plan

WHY CONDUCT IMP REVIEWS?

Joint management of hydrologically connected (HC) groundwater and surface water:

- Identify new opportunities and challenges
- Increase understanding of HC areas (data, studies)
- Evaluate and convey progress towards goals and objectives
- Prioritize joint management actions for upcoming years



IMP Overview

IMP Goals

Goal 1

Develop and maintain a District-wide water supply inventory.

Goal 2

Develop and maintain a District-wide water demand inventory.

Goal 3

Develop and implement water use policies and practices with the purpose of achieving and sustaining a balance between water uses and supplies.

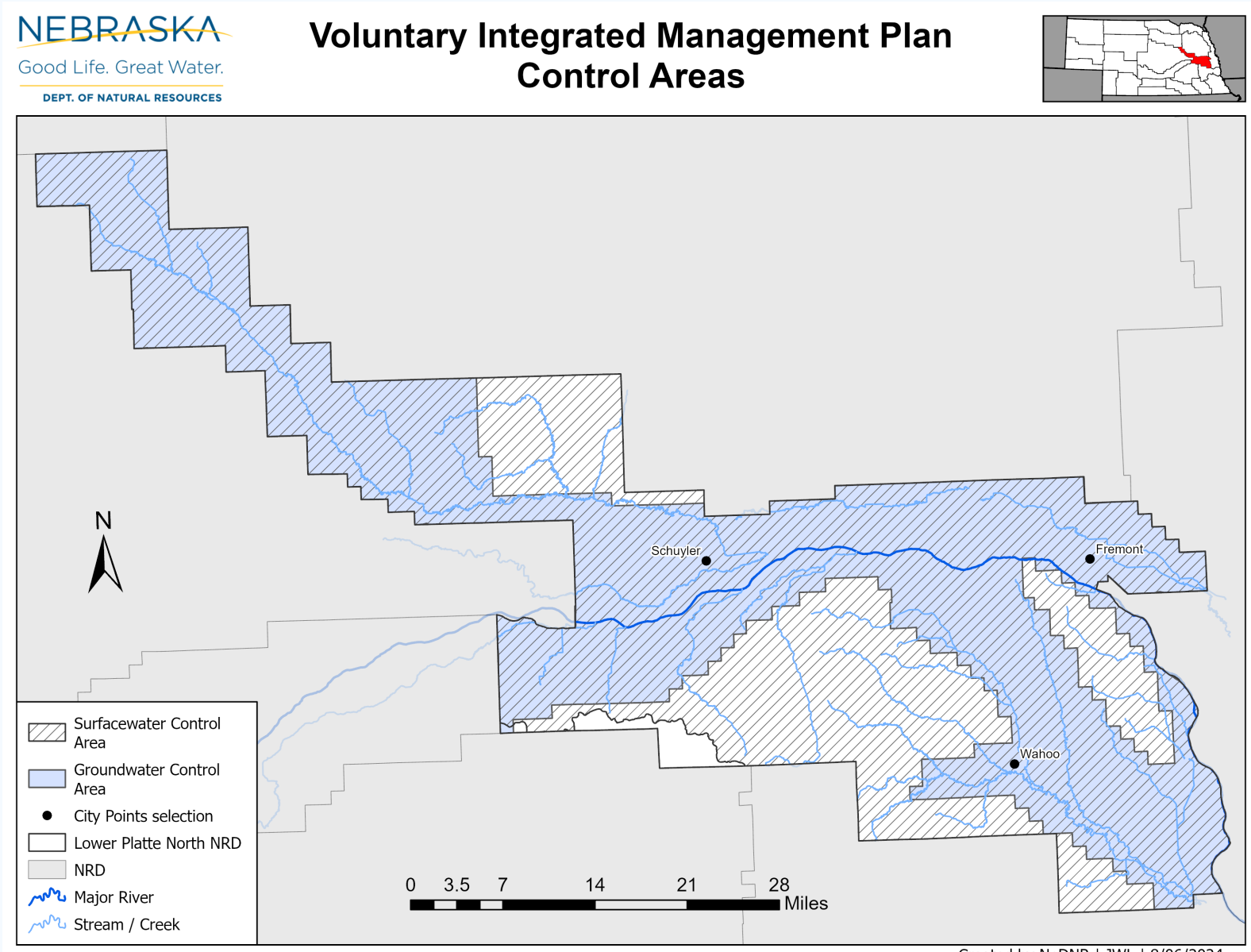
Goal 4

Communicate to the public that Nebraska has a great supply of water, and we need to continue to manage it well.

Goal 5

Coordinate with Lower Platte River Basin NRDs, and appropriate groups and agencies, to develop a water management plan for the Lower Platte River Basin that maintains a balance between current and future water supplies and demands.

LPNNRD IMP Control Areas



IMP Controls

- Groundwater
  - Limit new groundwater uses to 50% of the annually available stream depletions over the Basin Plan's first five-year increment
  - Require annual use reports for municipal groundwater users
- Surface water
  - Limit new groundwater uses to 50% of the annually available stream depletions over the Basin Plan's first five-year increment
  - Require annual use reports for municipal surface water permit holders and municipal groundwater transfer permit holders

Surface Water and Groundwater Monitoring

NeDNR Data Collection & Monitoring

NeDNR Monitoring

- Surface water monitoring: streamgage locations
- Surface water pump site inspections
- Surface water administration
- Voluntary surface water use reporting
- Hydrologic Investigation Project (HIP)

USGS Streamgage Locations in LPNNRD

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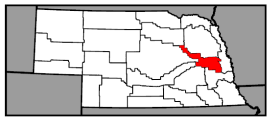
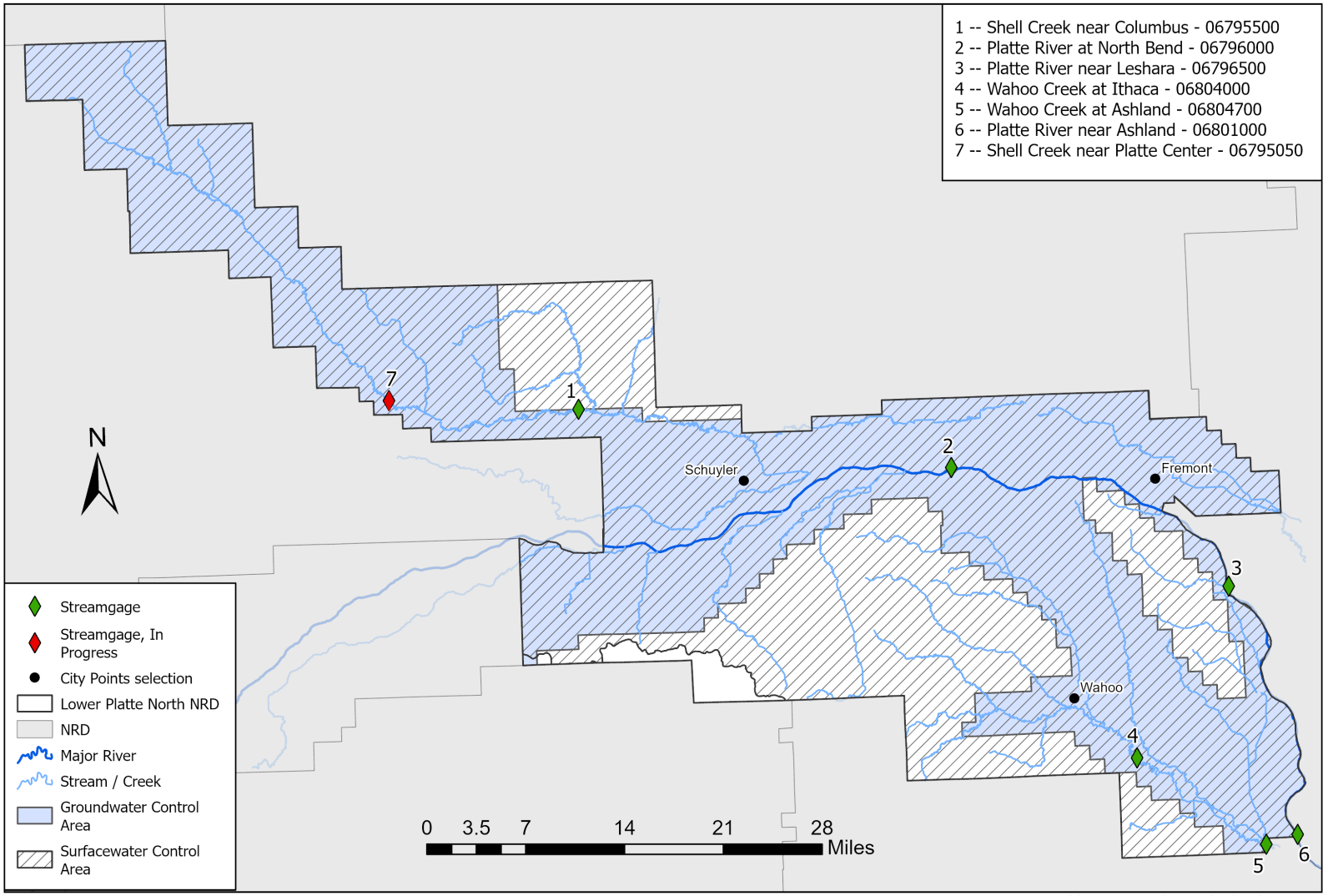
Streamgages within the Lower Platte North IMP Control Area





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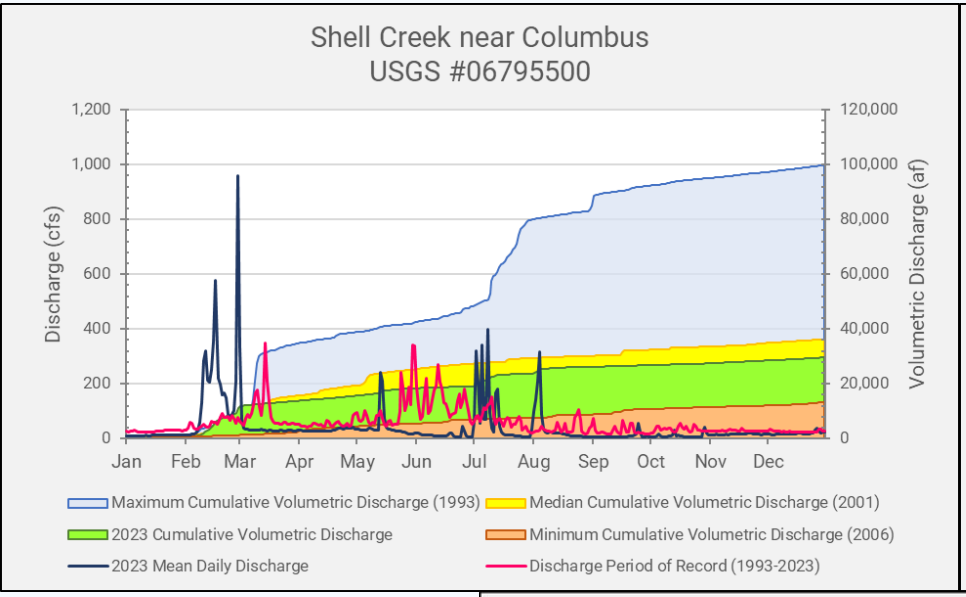
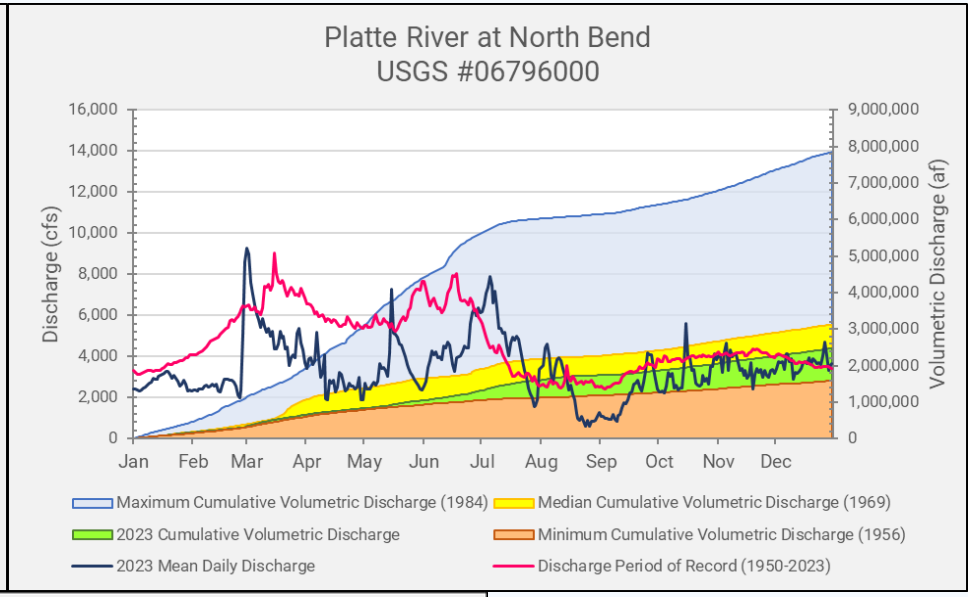
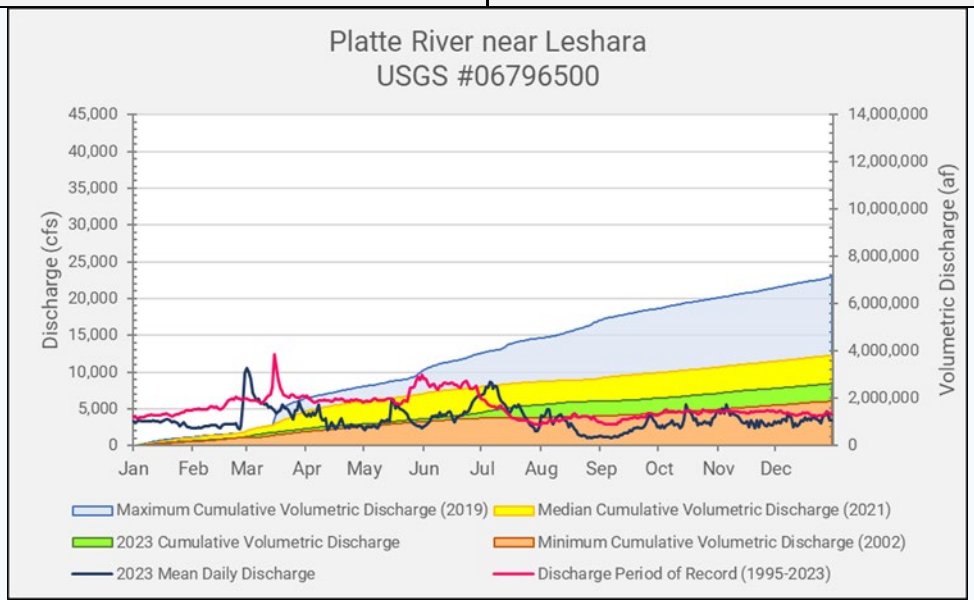
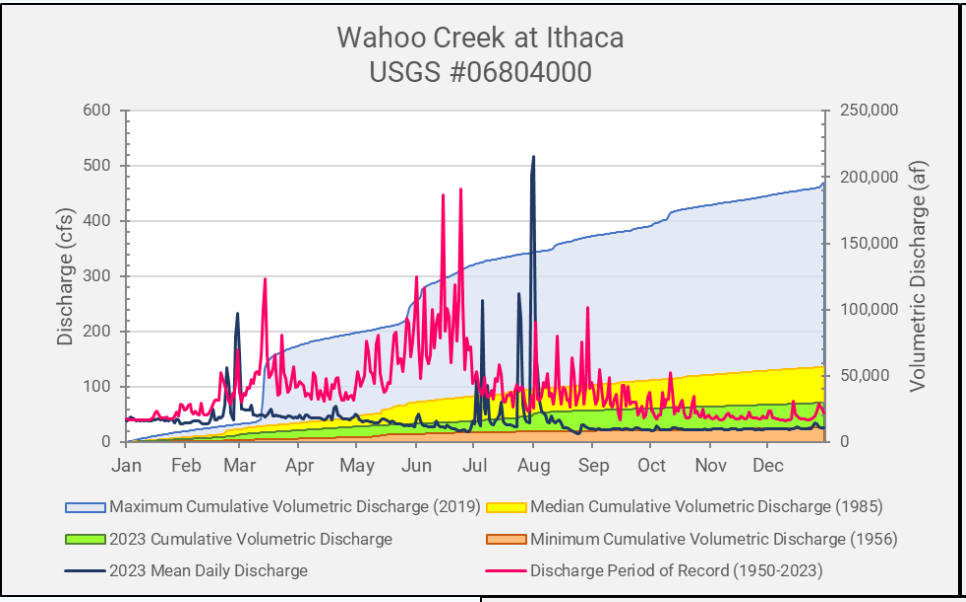
Surface Water Monitoring

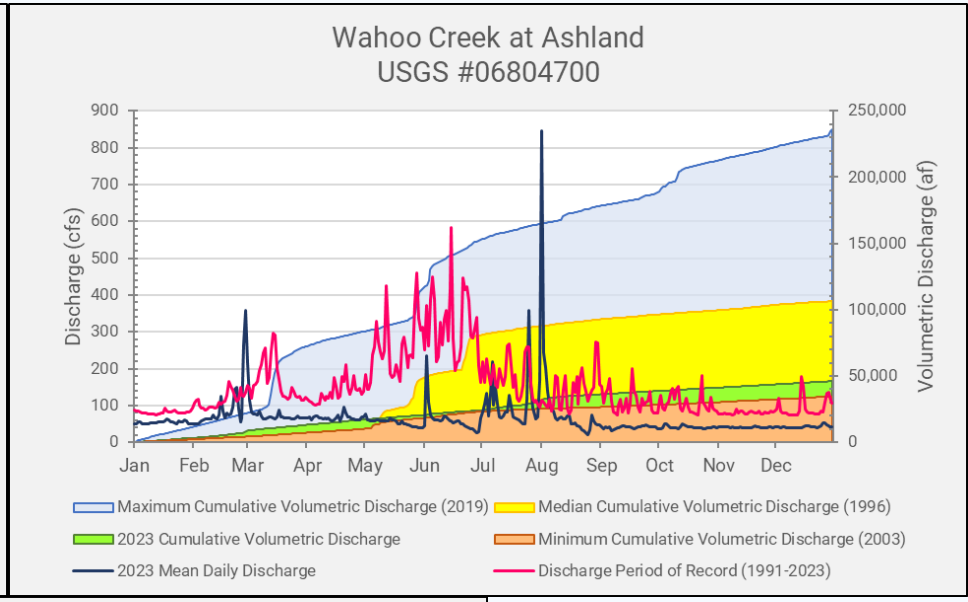


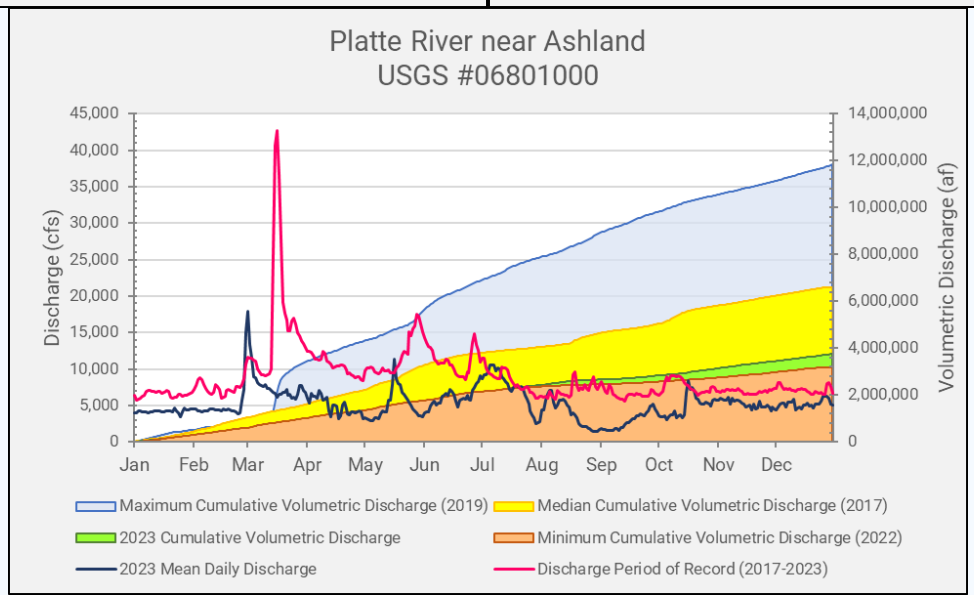




SURFACE WATER MONITORING







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NeDNR Surface Water Pump Site Inspections

During Summer 2023, the Department inspected 143 pump sites within the LPNNRD. Of the sites visited:

- 24 were surface water
- 54 were groundwater
- 70 appeared to be dryland
- 2 comingled
- A total of 220 pump site observations were made. Some rights were visited more than once for water administration purposes.

As time and conditions allow, the NeDNR field office staff visit pump sites for each appropriation to check for compliance and collect various data.

NeDNR Surface Water Pump Site Inspections

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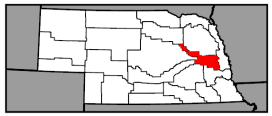
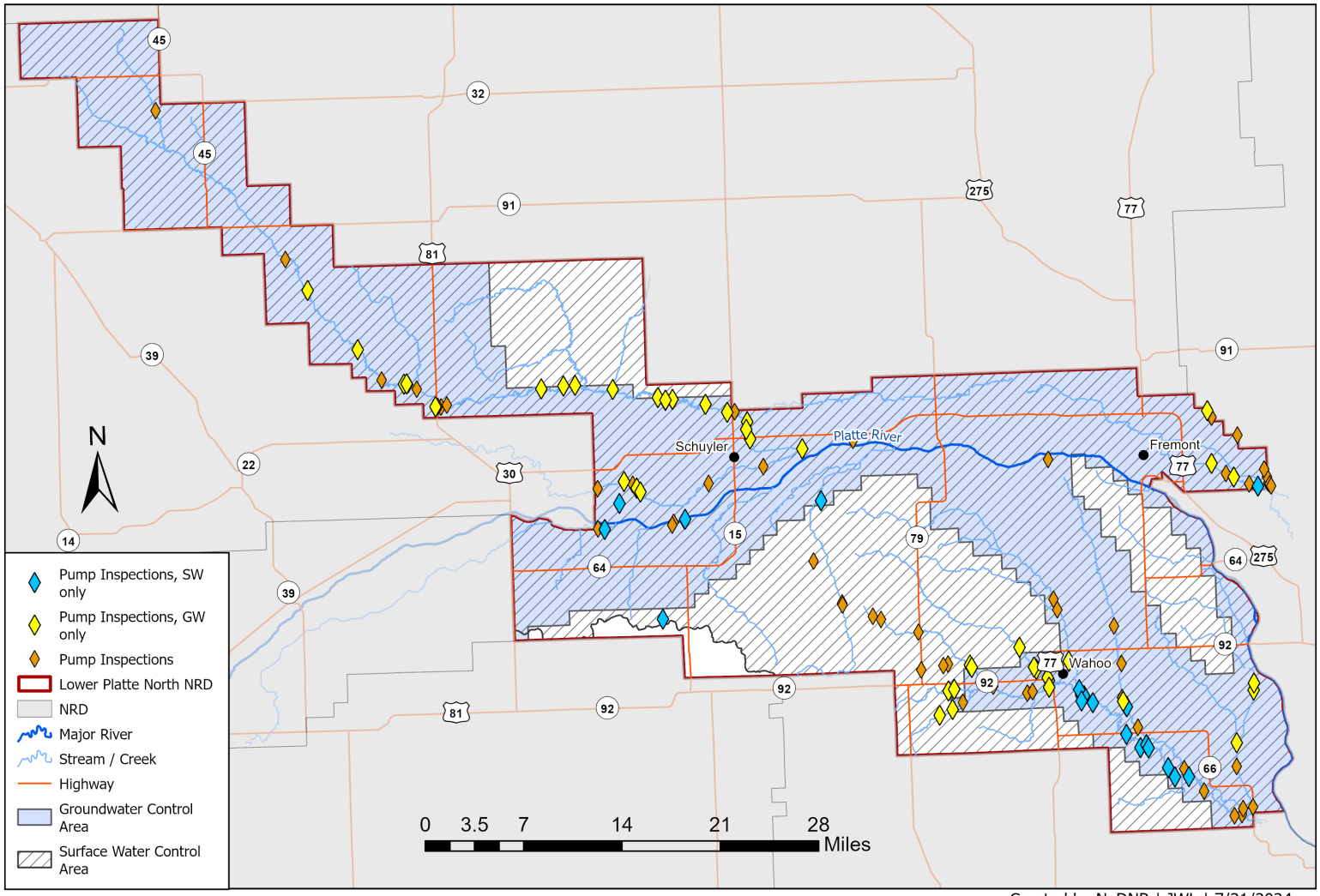
2023 Pump Site Inspections within the Lower Platte North IMP Control Area





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NeDNR Surface Water Pump Site Inspections

2023 Surface Water Pump Site Inspections – Lower Platte Basin NRDs			
NRD	**Total Number of Permits**	**Number of pump site Inspections**	**Number of pump sites set up for irrigation**
Lower Elkhorn	344	341	85
Lower Loup	758	656	368
Lower Platte North	137	137	24
Lower Platte South	201	175	36
Papio-Missouri River	109	91	19
Upper Elkhorn	86	84	21
Upper Loup	30	18	0
Total	**1665**	**1502**	**553**

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NeDNR Voluntary Surface Water Use Reporting for LPNNRD

	Surface Water Only	Groundwater Only	Co-Mingled	Dryland	Average Inches
2023 Water Use Acres and Source					
# Responses	16	6	2	9	
Acres Irrigated	1765		217		
2023 Estimated Water Use*					
# Responses	9		3		6.3
Acres Irrigated	831.5		65		

**The estimated water applied is reported by a sub-set of the total voluntary responses. The estimate here represents those who included water use data in their response.*

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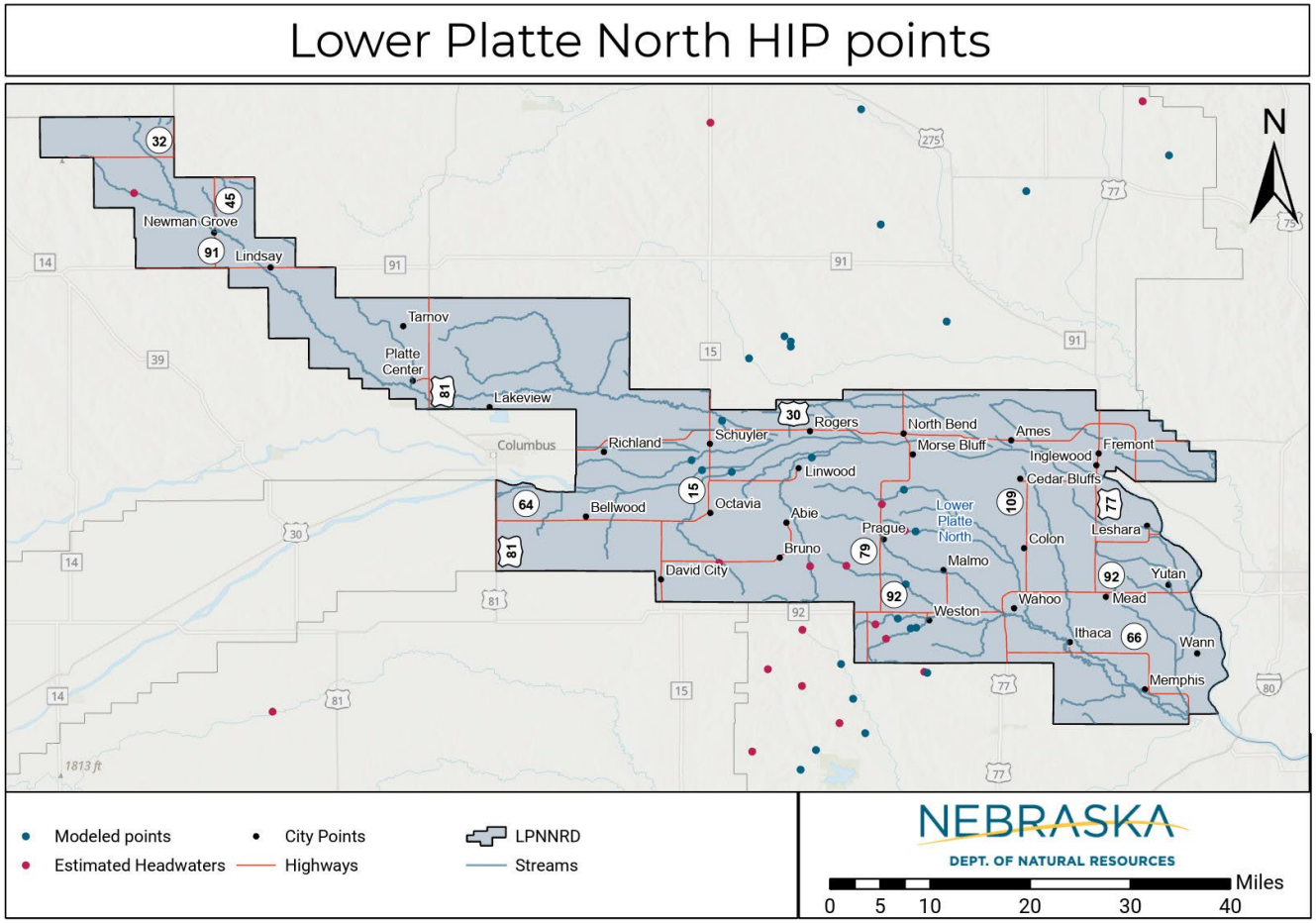
Hydrologic Investigation Project (HIP)

- Designed to identify GW/SW interaction throughout Eastern Nebraska
- Assist in aligning and verifying actual conditions with the LPMT model
- Recent efforts
  - Installation of streamgages to monitor wet/dry conditions
  - Identification of perennial and intermittent streams to increase the accuracy of the sub-regional modeling streams layer

Hydrologic Investigation Project



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NeDNR Surface Water Administration

2023 Surface Water Administration in the Lower Platte Basin					
Date of closure	Date Reopened	Permit Type	Number Affected	Reason for Closure	Reason for Reopening
8/21/2023	9/26/2023	Natural Flow	139	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded
8/21/2023	9/26/2023	Storage	31	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded
10/4/2023	10/16/2023	Natural Flow	139	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded
10/4/2023	10/16/2023	Storage	31	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded

NeDNR Groundwater Permitting Actions

Groundwater permits cancelled = 0
Groundwater permits issued = 1 (Pending)

Includes groundwater permits for the following uses:

- Application to Drill Without Regard to Spacing
- Industrial Groundwater Transfers
- Industrial Transfer Notice
- Municipal Groundwater Transfers
- Municipal Notice of Intent
- Permit to Violate Well Spacing
- Permit to Transfer to Adjoining State

Note: the groundwater permit is for well spacing, proposed well is in violation of a well in Lower Elkhorn NRD and has since been dismissed.

Municipal & Industrial Surface Water Uses

- No new surface water applications for municipal or industrial uses were approved during 2023.

NeDNR Surface Water Permitting Actions

- Approved for expedited transfer = 0
- Applications approved = 1
  - Permit is for irrigation, pumps out of Wahoo Creek for a total of 27 acres

NeDNR Surface Water Permitting Actions

Surface Water Appropriations Expired, Cancelled-in-Part or Cancelled-in-Full in 2023 Within the Voluntary IMP Area											
Appropriation Number	Cancel Date	Source	NeDNR Action	Location Diversion or Reservoir	Use	Begin Acres	Cancelled			Estimated Date of Last Use	Basis for NeDNR Action
							Acres	Grant (cfs)	Grant (af)		
A-9116	4/25/2023	Clear Cr.	Cancelled in Full	S8-T16N-R2E	IR	95.0	95.0	1.36	285.0	1980	REL-9860
A-12183	4/25/2023	Platte River	Cancelled in Full	S8-T16N-R2E	IR	92.0	92.0	1.32	277.5	1997	REL-9861
A-15841	4/17/2023	Platte River	Cancelled in Full	S11-T16N-R2E	IR	21.6	21.6	0.31	64.8	Never used	PDNU-9848
A-13534	4/17/2023	Bone Cr.	Cancelled in Full	S33-T16N-R3E	IR	57.5	57.5	0.82	172.5	1996	PDNU-9867
A-7244	3/30/2023	Platte River, Trib to	Cancelled in Full	S21-T17N-R6E	IR	1.0	1.0	0.01	3.0	1977	REL-9851
A-12070	11/27/2023	Platte River	Cancelled in Full	S21-T17N-R7E	IR	15.0	15.0	0.21	45.0	1993	REL-11032
A-12069	3/3/2023	Platte River, Trib to	Cancelled in Full	S21-T17N-R7E	IR	45.1	45.1	0.64	135.3	1993	REL-9868

NeDNR Surface Water Permitting Actions

Surface Water Appropriations Expired, Cancelled-in-Part or Cancelled-in-Full in 2023 Within the Voluntary IMP Area											
Appropriation Number	Cancel Date	Source	NeDNR Action	Location Diversion or Reservoir	Use	Begin Acres	Cancelled			Estimated Date of Last Use	Basis for NeDNR Action
							Acres	Grant (cfs)	Grant (af)		
A-13142	5/4/2023	Cottonwood Cr.	Cancelled in Full	S23-T15N-R6E	IR	29.00	29.00	0.41	87.0	1977	REL-9885
A-13322	3/13/2023	Sand Cr.	Cancelled in Full	S30-T16N-R7E	IR	54.00	54.00	0.77	162.0	1988	REL-9872
A-13945	4/25/2023	Sand Cr.	Cancelled in Full	S32-T16N-R7E	IR	77.60	77.60	1.11	232.8	2018	PDNU-9878
A-8174	1/17/2023	Sand Cr.	Cancelled in Full	S15-T15N-R7E	IR	36.00	36.00	0.26	108.0	1980	REL-9833
A-8528	10/4/2023	Sand Cr.	Cancelled in Full	S34-T15N-R7E	IR	1.50	1.50	0.01	4.5	2008	PDNU-10027
A-14282	5/12/2023	Wahoo Cr.	Cancelled in Full	S20-T14N-R8E	IR	152.70	152.70	2.18	458.1	2018	PDNU-9904
A-16612	3/31/2023	Silver Cr.	Cancelled in Full	S29-T15N-R8E	IR	107.20	107.20	1.53	321.6	Never Used	PDNU-9890 REL-9891

NeDNR Surface Water Permitting Actions

Surface Water Appropriations Expired, Cancelled-in-Part or Cancelled-in-Full in 2023 Within the Voluntary IMP Area											
Appropriation Number	Cancel Date	Source	NeDNR Action	Location Diversion or Reservoir	Use	Begin Acres	Cancelled			Estimated Date of Last Use	Basis for NeDNR Action
							Acres	Grant (cfs)	Grant (af)		
A-5982	3/13/2023	Silver Cr.	Cancelled in Full	S28-T14N-R8E	IR	145.00	145.00	1.40	435.0	2017	PDNU-9829
A-15521	5/12/2023	Silver Cr.	Cancelled in Full	S35-T14N-R8E	IR	80.00	80.00	1.14	240.0	Never Used	PDNU-9905
A-11785	8/31/2023	Wahoo Cr.	Cancelled in Full	S34-T13N-R9E	IR	82.50	82.50	1.18	247.0	2008	PDNU-9829
A-8322	4/24/2023	Silver Cr.	Cancelled in Full	S17-T13N-R9E	IR	22.00	22.00	0.31	66.0	1978	PDNU-10031
A-14657	6/20/2023	Clear Cr.	Cancelled in Full	S35-T14N-R9E	IR	281.90	281.90	4.03	845.7	2018	REL-9933
A-12070*	11/27/2023	Platte River	Cancelled in Part	S21-T17N-R7E	IR	40.0	25.0	36.0	75.0	1994	REL-9951
A-8528*	10/4/2023	Sand Cr.	Cancelled in Part	S34-T15N-R7E	IR	34.8	33.3	24.0	99.9	2008	REL-9889 REL-9975

* A-8528 and A-12070 are also cancelled in full on the same date as the cancelled in part. There are different relinquishment numbers assigned for each action.

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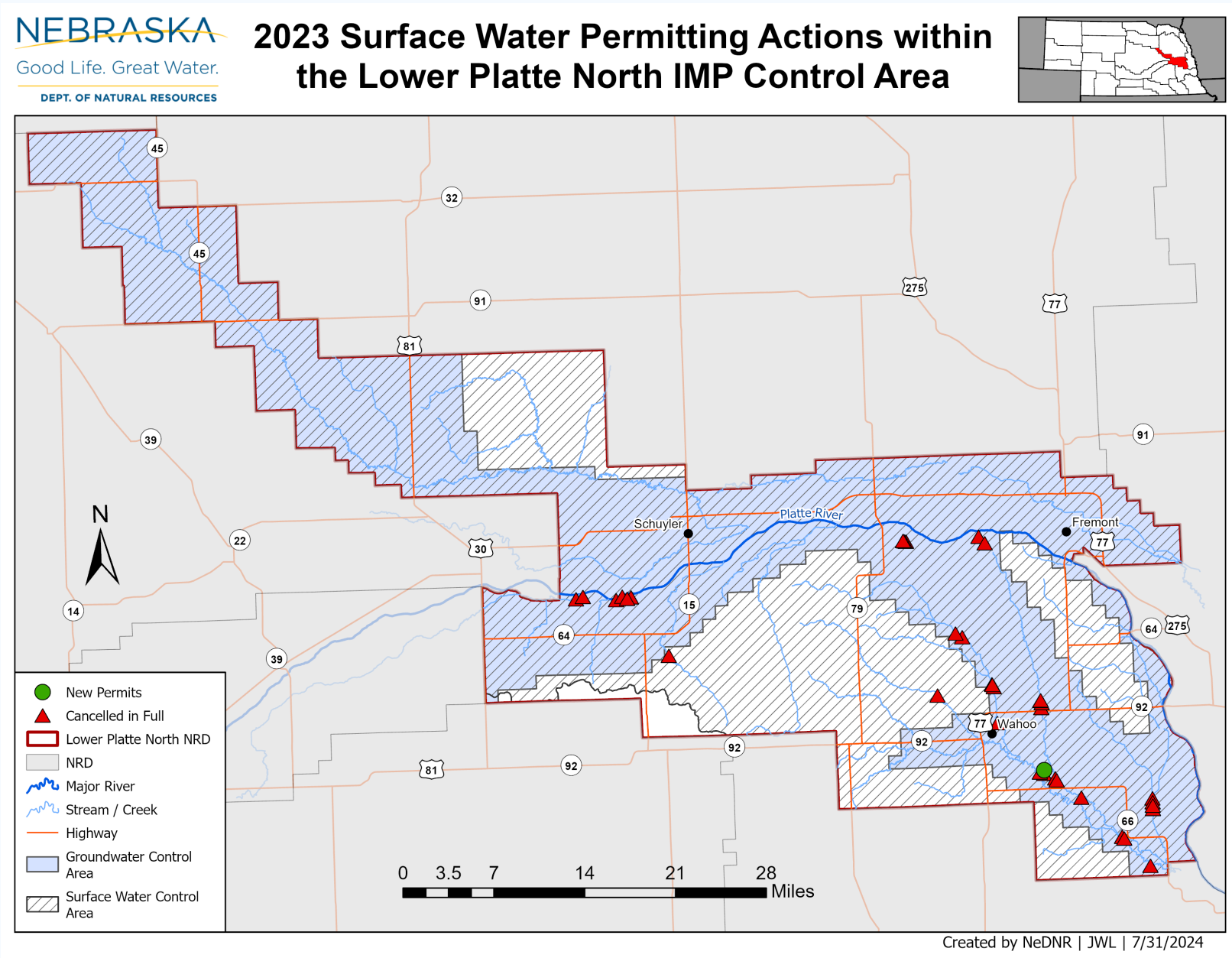
MAP OF SURFACE WATER PERMITTING ACTIONS



LPNNRD
Data Collection & Monitoring

IMP includes 14 collection and monitoring activities for the NRD

- NRD Monitoring
  - Irrigated acres expansion
  - Groundwater level measurements
  - Municipal water use
- Other
  - Studies and Planning
  - Education/Outreach Collaborations

LPNNRD
Data Collection and Monitoring

- Groundwater elevation data
  - The following compares Spring 2024 to 2023 with all areas lower in 2024.Districtwide Spring of 2024 was 1.17 feet lower.
    - The Upland area was 2.16 feet lower
    - The Todd Valley area was 1.62 feet lower.
    - The Platte Valley area was 0.58 feet lower.
    - The Shell Creek area was 0.71 feet lower
    - The WANN Basin area was 0.86 feet lower

**Access data from the LPNNRD's 2023 Report for the Lower Platte River Basin-Wide Management Plan—put in a HyperLink*

LPNNRD
Data Collection and Monitoring

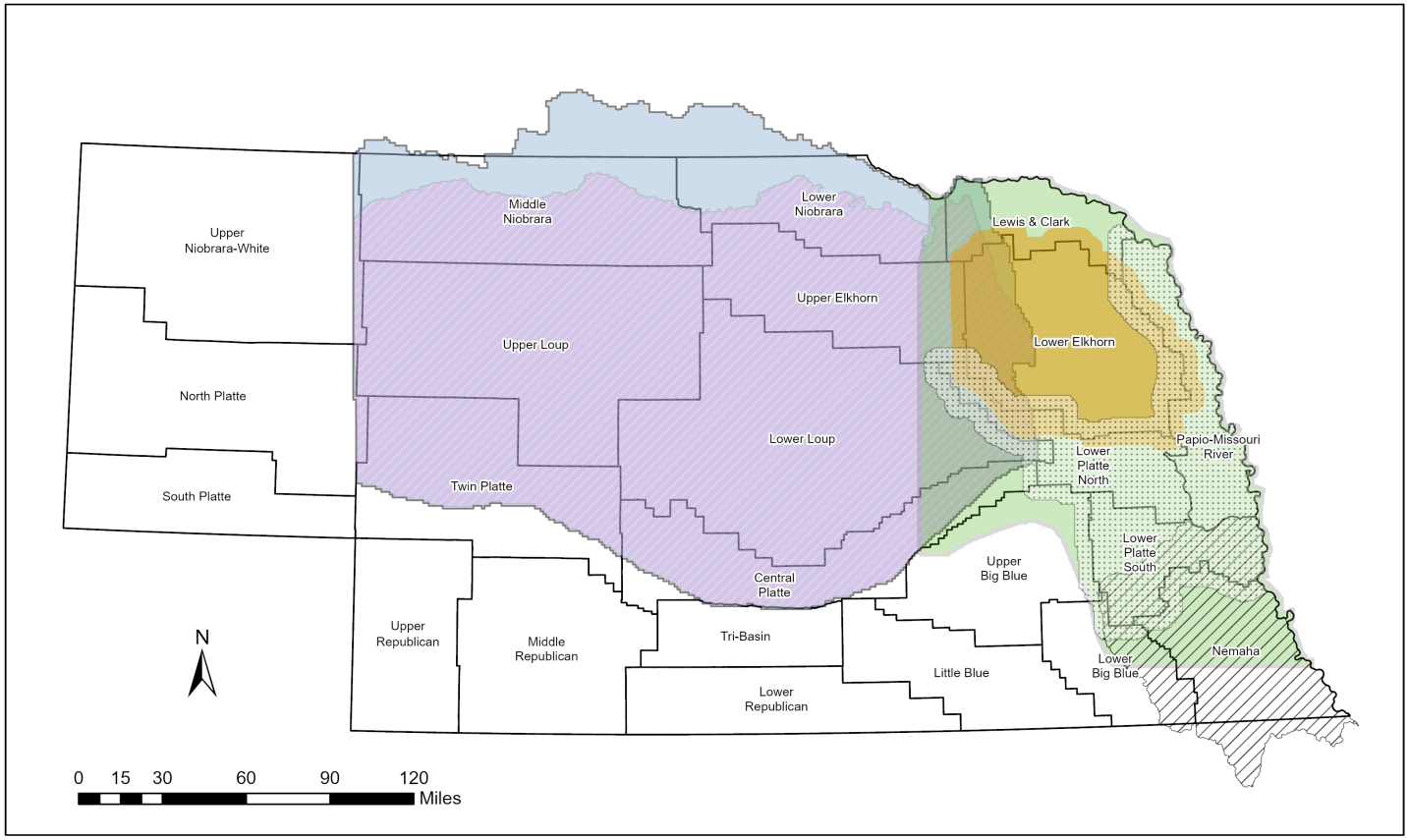
- Flow meter data – 2023
  - 1312 flow meters throughout District
  - 1155 flow meters are on irrigation systems
  - Water Use Information
    - SQS#1 – 4.65 in/ac
    - SQS#2 – 4.59 in/ac.
    - Rest of the District – 5.56 in/ac
- Certified irrigated groundwater acres
  (HCA – Hydrological Connected Area)
  - Total Irrigated - 392,484.47 acres
  - HCA Area – 335,720.95 acres
  - Non-HCA – 56,763.52 acres
- Municipal and industrial groundwater uses
  - Communities are required to report
    - In 2026 communities new water uses might need to considered for consumptive use.
  - Industrial reports are voluntary

LPNNRD
Data Collection and Monitoring

- New groundwater consumptive uses (agricultural, municipal, industrial)
  - Agricultural: 203.76 Acre Feet
    - 1287.14 acres approved for irrigation
  - None for industrial or municipal
    - These are for wells permitted by the NRD
- Transfer of acres for groundwater consumptive uses (agricultural, municipal, industrial)
  - Agricultural - 1.61 Acre Feet
    - Saunders County

Basin-wide Modeling Efforts

Lower Platte Missouri Tributaries Basin Model Coverage



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LPMT 3D (District) Model

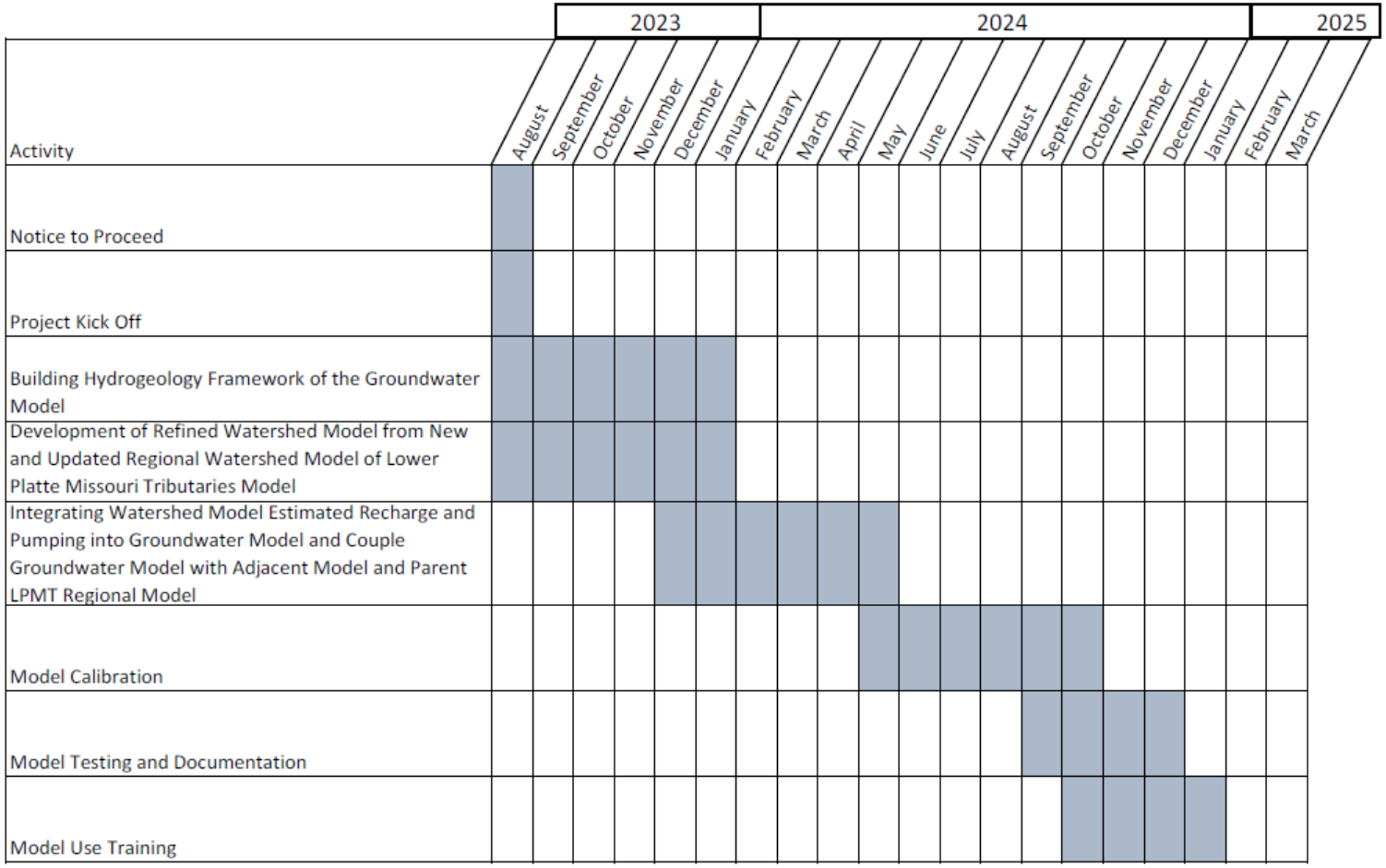
- Currently working on constructing model inputs into sub-regional model (LPMT 3D)
- To be used in Basin wide analysis
- Analysis will include an updated Hydrological Connected Area (HCA) area.
  - Currently called LPN Blue Area
- HCA would be an area that a groundwater well that is constructed in the 10/50 area would deplete river flow by at least 10 percent of the water pumped over a 50-year period.

Modeling Updates
Sub-Regional Model

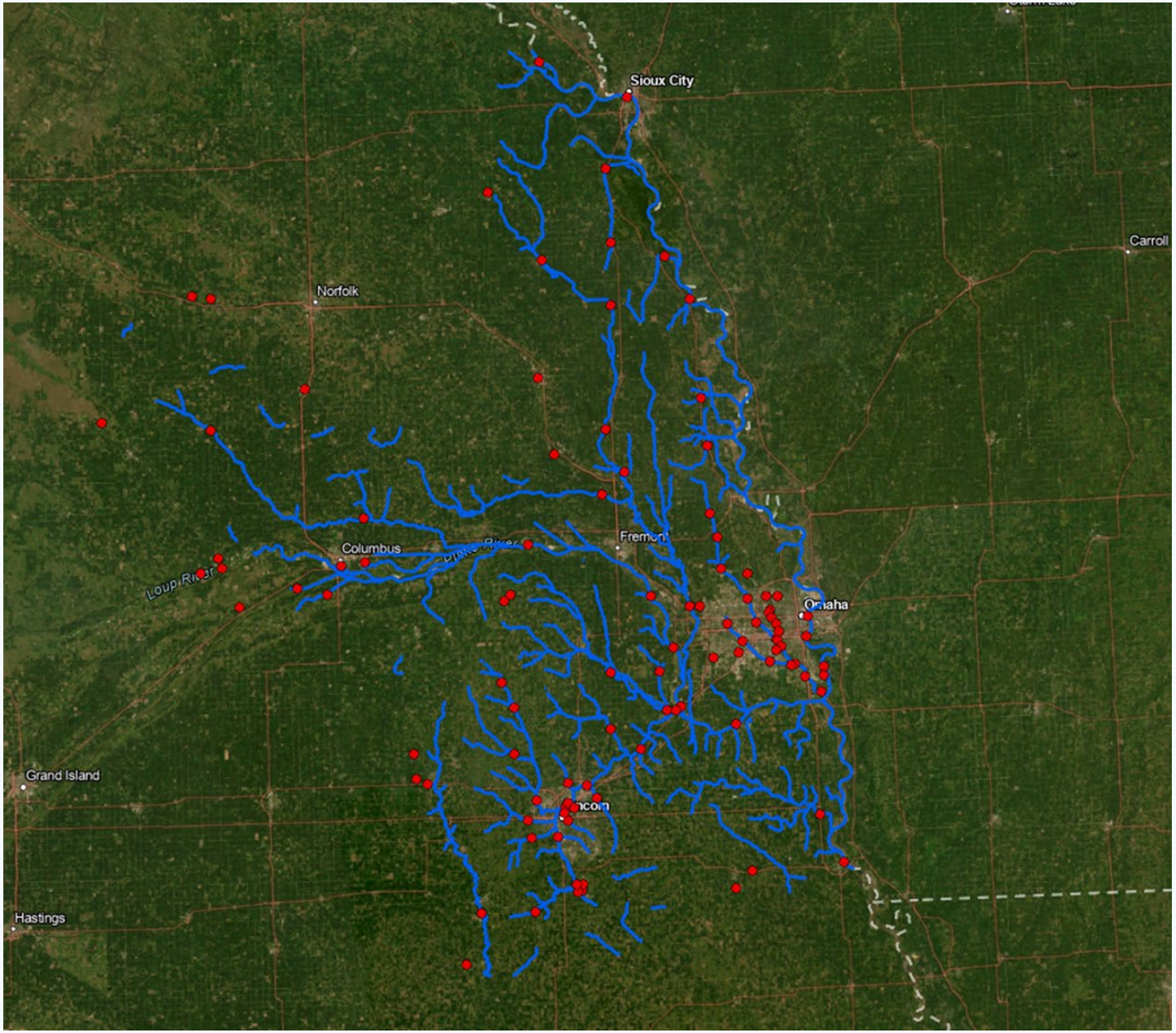
Revised Schedule

LOWER PLATTE RIVER SUB-REGIONAL GROUNDWATER MODELING

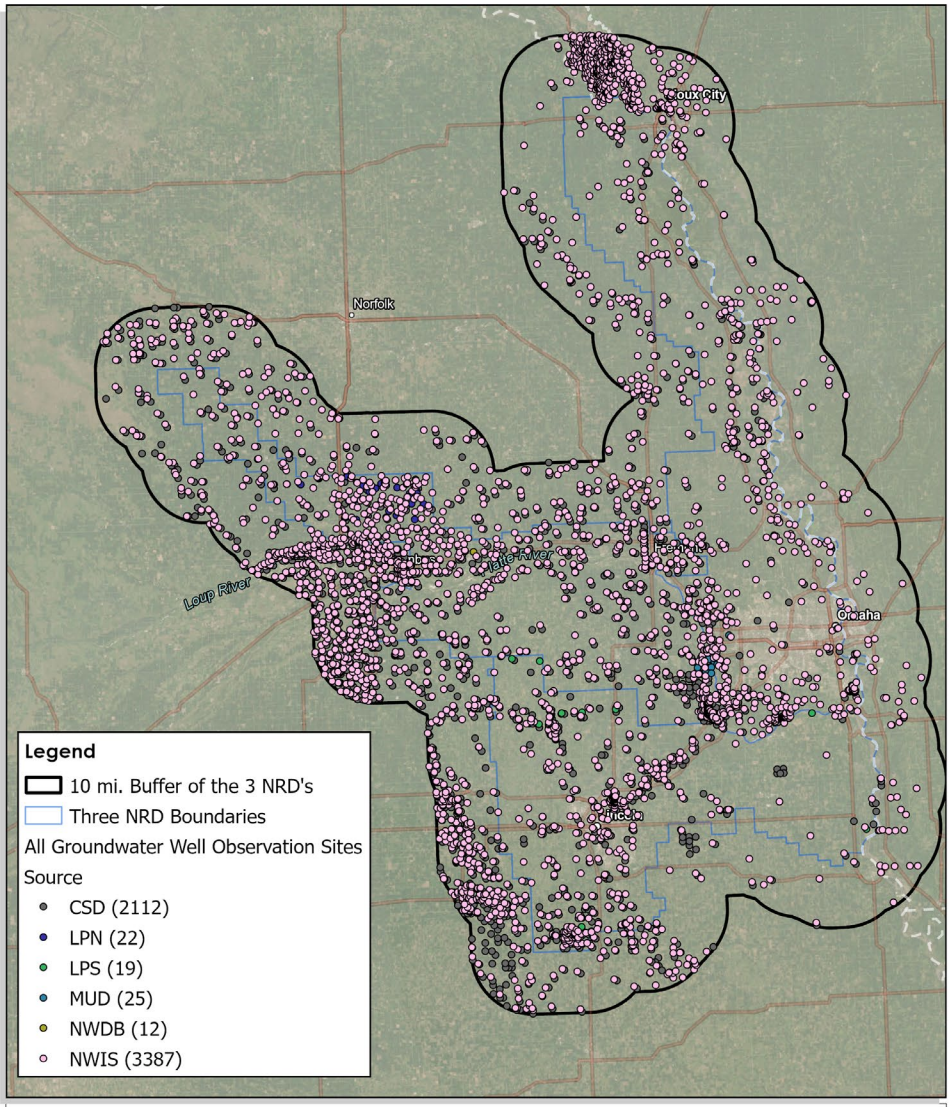
JEO Project No. 221004.00



LPMT 3D STREAMS LAYER



LPMT Groundwater Sites



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Date: 05/30/2024
Revised: 07/25/2024
Software: ArcPro 3.2.2
File: 221004.00

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Available Groundwater Sites

Eastern Nebraska

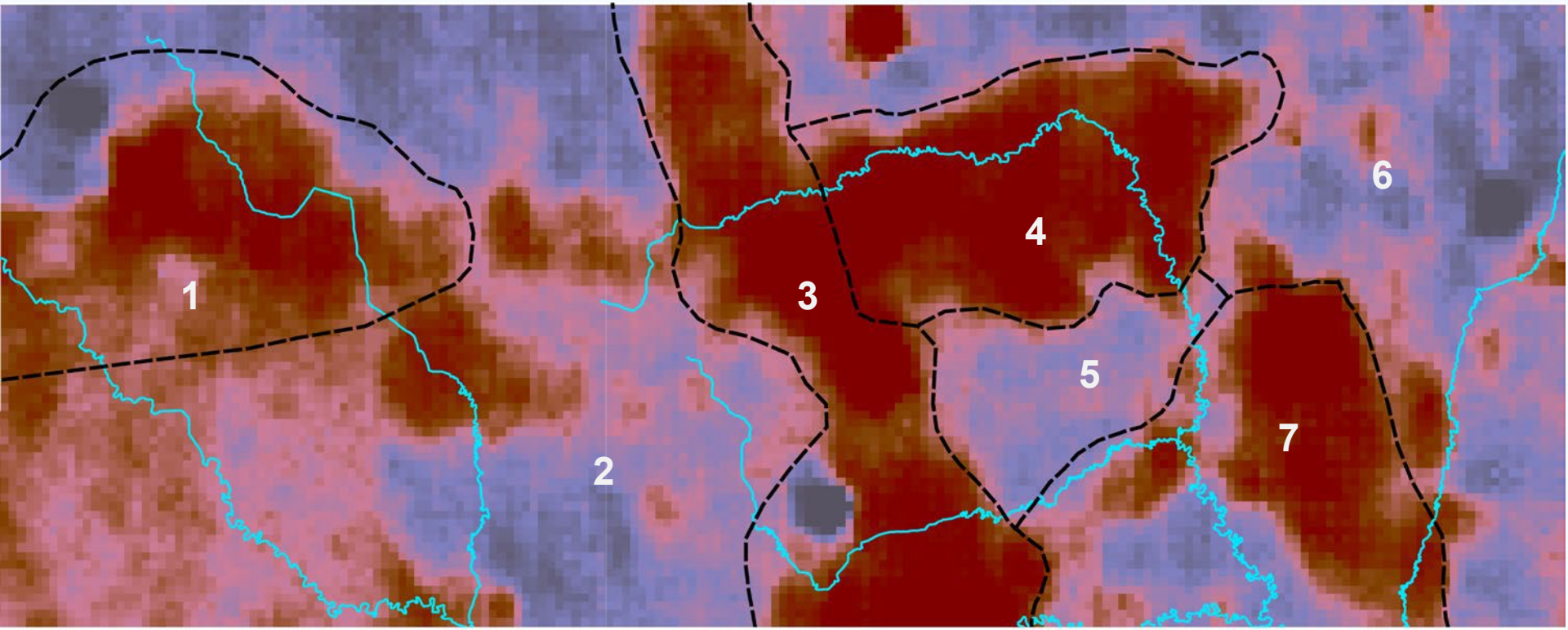
0 5 10 20 Miles

N

JEO CONSULTING GROUP INC

IMP Modeling Updates

- LPNNRD hydrogeologic framework study with UNL-CSD (SQS # 2)
  - Seven groundwater management zones were developed based on hydrofacies probability and hydrograph characteristics
  - Map is from UNL-CSD published study June 2023



Basin Coalition Plan Implementation

Basin-Wide Activities

LPNNRD and NeDNR participate in the Lower Platte River Basin Coalition (LPRBC)

- Managers' and Technical Team meetings
- Annual reporting (see next slide)
- Annual Reporting Database
  - Tool to report and store annual water use data
- Lower Platte Missouri Tributaries Model
  - Tool to analyze aquifer-stream interactions

Estimated Stream Depletions

New Depletions Accounting

Lower Platte River Basin 2022-2023

2022 and 2023 Estimated Stream Depletions and Accretions Summary										
NRD	2022				2023				Net Total Depletions	
	Depletions		Accretions		Depletions		Accretions			
	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak
Lower Elkhorn	0	0	10	0	0	0	38.02	0	28.0	0
Lower Loup	145.97	17.4	83.87	9.5	46.1	0	19.2	0	127.4	7.9
Lower Platte North	0	0	0	0	14	0	0	0	14.0	0
Lower Platte South	39.2	10	20	10	0	0	0	50	19.2	-50
Papio-Missouri River	0	18	0	0	0	0	0	0	0.0	18
Upper Elkhorn	0	0	0	0	0	30.9	0	0	0.0	30.9
Upper Loup	0	0	0	0	0	0	0	0	0.0	0
Basin Total	185	45	114	20	60	31	57	50	189	7

DEPLETIONS PERCENTAGES

BASIN WIDE AND LPNNRD

NRD	Total New Peak Season Depletions	Remaining 5-YR Allowable Depletion (AF)	Combined Percent of Allowable	Percent of Remaining 5-YR Allowable Depletion
Upper Loup NRD	39.5	5354.0	0.7%	99.3%
Lower Loup NRD	15.2	11913.5	0.1%	99.9%
Upper Elkhorn NRD	0.3	2927.0	0.0%	100.0%
Lower Elkhorn NRD	267.9	8088.1	3.2%	96.8%
Papio-Missouri River NRD	88.5	1722.9	4.9%	95.1%
Lower Platte South NRD	-0.9	2066.5	0.0%	100.0%
Lower Platte North NRD	219.4	3571.4	5.8%	94.2%
TOTALS	**630**	**35,643**	**1.7%**	**98%**

Education & Outreach Activities

NeDNR
- State Fair
- Husker Harvest Days

LPNNRD
- Nitrogen Certification Classes
- School Presentations

Joint Activities
- Spring Conservation Educational Event

Actions and Goals

Jointly Identified Actions for Next Two Years

- Cooperate on efforts to increase sources of available surface & groundwater data
- Participate in basin-wide and regional planning efforts such as ENWRA, the Lower Platte River Consortium (drought planning), and Lower Platte River Basin Coalition (LPRBC)
- Participate in education and outreach events
- Update the LPNNRD plan to work together with the Basinwide Plan
- Finish the LPMT-3D Model for inclusion in the 5-year BWP update

Questions?

Thank You!

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