Nebraska Department of Natural Resources

2022 Annual Report

of 2021 Data for the

Lower Platte River Basin Coalition's
Basin Water Management Plan

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1. Introduction

In April 2013, The Nebraska Department of Natural Resources (NeDNR) and seven Natural Resources Districts (NRDs) entered into an Interlocal Cooperative Agreement to form the **Lower Platte River Basin Water Management Plan Coalition** (Coalition). The Nebraska Association of Resource Districts (NARD) serves as the coordinator on behalf of the Coalition. The members of the Coalition are:

- Lower Platte South NRD,
- Lower Platte North NRD,
- Papio-Missouri River NRD,
- Lower Loup NRD,
- Lower Elkhorn NRD,
- Upper Elkhorn NRD
- Upper Loup NRD, and
- NeDNR

The Lower Platte River Basin (Basin) overlies portions of central and eastern Nebraska (Figure 1). The Coalition recognizes the hydrologic connectivity of groundwater and surface water resources within the Basin, and desires to work together to manage the resources. The Coalition jointly developed and adopted the Lower Platte River Basin Water Management Plan (Plan) in 2018, to protect and sustain the long-term balance between the water uses and water supplies. The Plan requires reporting on an annual basis, which this report serves to fulfill.

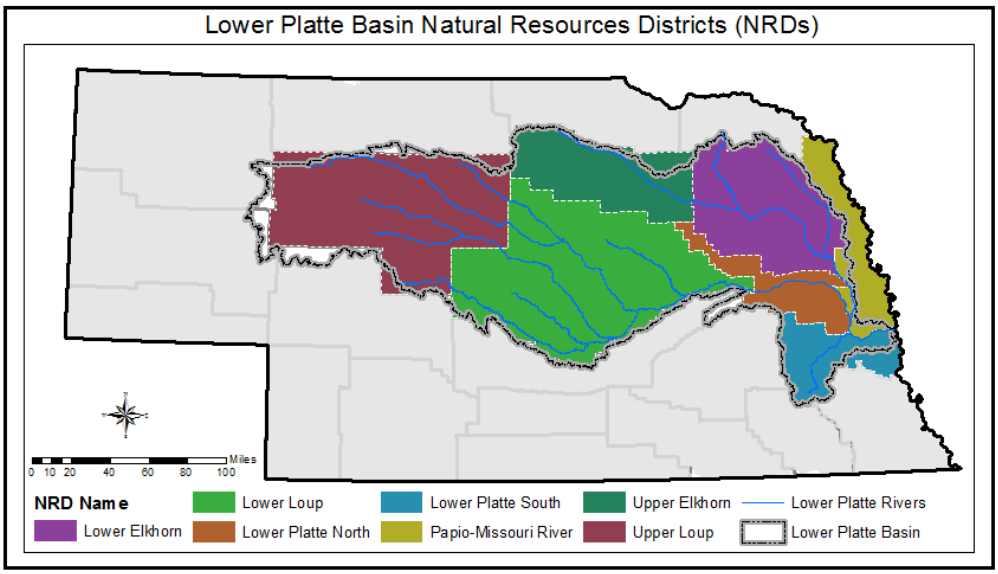

Figure 1. Map of Lower Platte River Basin Coalition NRDs

2. Surface Water and Groundwater Monitoring

A. NeDNR Streamgage Monitoring

NeDNR is authorized to measure and monitor the water flowing in Nebraska streams. Within the Basin, NeDNR maintains 21 streamgages (Table 1). Additional gages are maintained by the U.S. Geological Survey (USGS). Instantaneous and averaged streamflow data for both NeDNR and USGS gages may be accessed by visiting NeDNR's interactive streamgaging map at https://nednr.nebraska.gov/RealTime/. All website data are provisional and subject to revision unless otherwise denoted.

Table 1. A listing of NeDNR maintained streamgages

NeDNR Streamgages in the Lower Platte River Basin		
Station Name	Station Number	River Basin
Middle Loup River at Rockville	6780000	Loup
Mud Creek near Sweetwater	6783500	Loup
Turkey Creek near Dannebrog	6784800	Loup
Calamus River near Harrop	6787000	Loup
Calamus River near Burwell	6787500	Loup
North Loup River at Ord	6788500	Loup
Mira Creek near North Loup	6788988	Loup
Cedar River near Spalding	6791500	Loup
Cedar River near Fullerton	6792000	Loup
Beaver Creek at Loretto	6793500	Loup
Loup River at Columbus	6794500	Loup
Willow Creek near Pierce	232500	Elkhorn
Elkhorn River near Atkinson	6796973	Elkhorn
South Fork Elkhorn River near Ewing	6798000	Elkhorn
Elkhorn River at Neligh	6798500	Elkhorn
Elkhorn River near Tilden	6798780	Elkhorn
Willow Creek near Foster	6799080	Elkhorn
Union Creek at Madison	6799230	Elkhorn
Pebble Creek at Scribner	6799385	Elkhorn
Logan Creek at Pender	6799450	Elkhorn
Elkhorn River near Winslow	6799510	Elkhorn

B. NeDNR Irrigation Canal Monitoring

In addition to streamgaging, NeDNR monitors and measures surface water diversions of irrigation canals at 21 sites across the Basin (Table 2). Instantaneous and averaged canal diversion data may be accessed at NeDNR's interactive streamgage map at: https://nednr.nebraska.gov/RealTime/.

Table 2. A listing of NeDNR irrigation canal measurement sites

NeDNR irrigation Canal Measurement Sites		
Canal Name	Canal Number	River Basin
Calamus Fish Hatchery inlet from Calamus	19800	Loup
Farwell (Sherman Feeder) Canal from Middle Loup River	47000	Loup
Farwell Main Canal from Sherman Reservoir	48000	Loup
Farwell South Canal from Sherman Reservoir	49000	Loup
Fullerton Canal from Davis Creek Reservoir	54700	Loup
Kent Canal from North Loup River	76500	Loup
Loup River Power Canal Return at Columbus	82100	Loup
Inlet Canal to Davis Cr. Res. from Mirdan	88500	Loup
Middle Loup Canal No. 1 from Middle Loup	90000	Loup
Middle Loup Canal No. 1 Pump from Middle	90200	Loup
Middle Loup Canal No. 2 from Middle Loup	91000	Loup
Middle Loup Canal No. 3 from Middle Loup	92000	Loup
Middle Loup Canal No. 4 from Middle Loup	93000	Loup
Middle Loup Canal No. 4 from Sherman Feeder Canal	93200	Loup
Mirdan Canal from Calamus Reservoir	100500	Loup
Taylor-Ord Canal from North Loup River	107000	Loup
Taylor-Ord Canal inlet to Mirdan Canal	107100	Loup
Taylor-Ord Canal outlet from Mirdan Canal	107200	Loup
Burwell-Sumter Canal from North Loup River	108000	Loup
Ord-North Loup Canal from North Loup River	109000	Loup
Sargent Canal from Middle Loup River	130000	Loup

C. Surface Water Pump Site Monitoring

The NeDNR field office staff regularly inspect pump sites of permitted surface water diversions as a part of surface water monitoring. Depending on conditions and staffing, not all pump sites are inspected every year, and some pump sites may be visited more than one time per year. NeDNR field offices within the Basin are in Lincoln, Norfolk, and Ord, Nebraska. Table 3 provides a listing of surface water pump site inspections conducted in 2021. The data are organized by NRD and provide information about the total number of surface water appropriations, the number of pump sites inspected, and of those, how many sites were set up for irrigation at the time of the inspection.

Table 3. Surface water pump site inspections conducted in 2021

2021 Surface Water Pump Site Inspections			
NRD	Total Number of Permits	Number of pump site Inspections	Number of pump sites set up for irrigation
Lower Elkhorn	336	318	88
Lower Loup	775	577	261
Lower Platte North	152	141	21
Lower Platte South	174	177	30
Papio-Missouri River	96	84	21
Upper Elkhorn	79	2	2
Upper Loup	27	22	2
Total	**1639**	**1321**	**425**

D. Surface Water Administration

Surface water administration is the enforcement of the prior appropriation doctrine principle of first in time, first in right, in times of shortage. Surface water administration that affected the Basin occurred on August 12, 13, and 16, 2021. Here, NeDNR issued closing notices for the benefit of the instream flow permits held by Nebraska Game and Parks Commission and by Central Platte Natural Resources District. The closures applied to both storage and natural flow appropriations having a priority date junior to November 30, 1993. Opening notices were sent to the appropriators on August 30, 2021, due to increased flows that exceeded instream flow right amounts. A summary of 2021 water administration is provided in Table 4.

Table 4. 2021 Lower Platte River Basin Surface Water Administration

2021 Lower Platte River Basin Surface Water Administration						
NeDNR Water Division	Date of Closure	Date Reopened	Permit Type	Number of Affected Permits	Reason for closure	Reason for reopening
2A-Loup River Basin	12-Aug	30-Aug	Natural Flow	58	Not enough water for NGPC instream flow right	Water for NGPC instream flow right has been exceeded
	13-Aug	30-Aug	Storage	5		
	13-Aug	30-Aug	Storage	5		
	13-Aug	30-Aug	Natural Flow	3		
	13-Aug	30-Aug	Natural Flow	76		
	13-Aug	30-Aug	Storage	22		
2B-Elkhorn River and Salt Creek	16-Aug	30-Aug	Storage	19		
	16-Aug	30-Aug	Natural Flow	65		
	16-Aug	30-Aug	Storage	67		
	16-Aug	30-Aug	Natural Flow	11		

E. Surface Water Permits for Induced Groundwater Recharge (Previously Issued)

No new induced groundwater recharge permits were issued and no changes to existing permits occurred in 2021. Induced groundwater recharge permits have no reporting requirements as a condition of the permit. Currently, the City of Lincoln and the Metropolitan Utilities District (MUD) are the only two appropriators holding induced groundwater recharge permits within the Basin.

Table 5 provides a summary of the induced groundwater recharge permits within the Basin. The associated municipal groundwater transfer permits, although not surface water, are also included. This is because the groundwater permits are associated with the induced groundwater recharge surface water permits. For example, the City of Lincoln has one induced groundwater recharge surface water permit, A-17312, with two associated municipal groundwater transfer permits for the Ashland wellfield. MUD has two induced groundwater recharge surface water permits, each with an associated municipal groundwater transfer permit, for each of its two wellfields: A-17310 and A-10538 in the south wellfield, and A-17318 and A-17356 in the west wellfield.

Table 5. City of Lincoln and MUD surface water permits for induced groundwater recharge

Surface Water Permits for Induced Groundwater Recharge						
Permit Holder	Permit Number	Priority Date	Associated GW Municipal Transfer	Number of Wells	Rate in cubic feet per second (cfs)	Required Reporting
City of Lincoln	A-17312	1/21/1964	A-10367	31	704 - Summer	No
					200 - All Other Seasons	
		1/1/1970	A-16917	7	No additional streamflow	No
		1/1/1980		6	No additional streamflow	
		1/1/1990		2	No additional streamflow	
		1/1 /1993		2	No additional streamflow	
MUD	A-17310	1/1/1970	A-10538	38	480	No
		1/1/1990		1	20	
	A-17318	10/6/1993	A-17356	42	160	No

Table 6 provides a summary of the permitted maximum water withdrawals for the City of Lincoln's and MUD's Municipal Groundwater Transfer Permits. The annual reports submitted by City of Lincoln and MUD for these permits are available upon request.

Table 6. Municipal groundwater transfer permits held by the City of Lincoln and MUD

Municipal Groundwater Transfer Permits					
Permit Holder	Appropriation Number	Priority Date	Maximum Daily Withdrawal	Total Annual Withdrawal	Required Reporting
City of Lincoln	A-10367	6/15/1931	60 Million Gallons	NA	Yes
	A-16917	1/25/1990	50 Million Gallons	NA	Yes
MUD	A-10538	2/15/1965	60 Million Gallons	NA	Yes
	A-17356	3/1/1994	104 Million Gallons	19 Billion Gallons	Yes

F. Groundwater Permits (Previously Issued by NeDNR)

The data provided by permit holders of groundwater pumped in 2021, for the applicable permits listed in Table 7, are available electronically upon request. The types of groundwater permits shown are authorized as follows:

- "Municipal" is a Municipal Groundwater Transfer Permit pursuant to Neb. Rev. Stat. §46-613.01, §§46-639 - 46-650
- "Industrial Transfer" is an Industrial Groundwater Transfer Permit pursuant to Neb. Rev. Stat. §§46-675 – 46-689
- "Municipal Notice of Intent" is a notice pursuant to Neb. Rev. Stat. §46-655.01

Table 7. NeDNR groundwater permits (previously issued)

NeDNR Groundwater Permits (Previously Issued)				
Index Number	Permit Holder	Appropriation Number	Approval Date	Permit Type
3	Lincoln, City of	A-10367	5/28/1964	Municipal
4	Fremont, City of	A-10411	8/21/1964	Municipal
8	Wakefield, City of	A-10531	3/8/1965	Municipal
9	Plattsmouth, City of	A-10533	3/8/1965	Municipal
11	Metropolitan Utilities District	A-10538	6/9/1965	Municipal
17	Leigh, Village of	A-10578	5/10/1965	Municipal
18	Laurel, City of	A-10579	5/10/1965	Municipal
24	Ashland, City of	A-10589	5/10/1965	Municipal
26	Lincoln, City of	A-10595	5/10/1965	Municipal
27	Columbus, City of	A-10596	5/10/1965	Municipal
32	Fremont, City of	A-12171	4/29/1971	Municipal
33	Fremont, City of	A-13909	2/19/1976	Municipal
34	Columbus, City of	A-15704	10/17/1980	Municipal
41	Wayne, City of	A-16525	1/16/1987	Municipal
42	Laurel, City of	A-16530	1/16/1987	Municipal
49	Howells, Village of	A-16888	12/8/1989	Municipal
51	Howells, Village of	A-16911	4/6/1990	Municipal
52	Lincoln, City of	A-16917	8/31/1990	Municipal
53	Wayne, City of	A-16927	6/25/1990	Municipal
54	Bruno, Village of	A-16964	7/12/1990	Municipal
57	Howells, Village of	A-17082	9/16/1991	Municipal
58	Valparaiso, Village of	A-17086	9/16/1991	Municipal
63	Valparaiso, Village of	A-17212	9/29/1992	Municipal
71	Columbus, City of	A-17325	12/11/1995	Municipal

NeDNR Groundwater Permits (Previously Issued)				
Index Number	Permit Holder	Appropriation Number	Approval Date	Permit Type
72	Pleasant Dale, Village of	A-17351	4/11/1994	Municipal
73	Eagle, Village of	A-17352	10/27/1994	Municipal
74	Metropolitan Utilities District	A-17356	12/10/1998	Municipal
78	St. Paul, City of	A-17426	1/4/1996	Municipal
121	Clarkson, City of	A-17556	4/2/1998	Municipal
158	Humphrey, City of	A-17807	3/7/2001	Municipal
194	Palmer, Village of	A-17949	2/19/2002	Municipal
128	Ceresco, Village of	A-18018	8/27/2002	Municipal
199	Cuming County Rural Water District #1	A-18024	6/13/2005	Municipal
218	Weston, Village of	A-18070	6/13/2005	Municipal
212	Springfield, City of	A-18104	4/14/2006	Municipal
225	Cass County Rural Water District #2	A-18163	5/3/2006	Municipal
109	Tyson Fresh Meats, Inc.	I-4	10/22/1996	Industrial Transfer
110	Nebco, Inc.	I-5	9/27/1996	Industrial Transfer
270	Nebco, Inc.	I-5A	7/31/2006	Industrial Transfer
141	Hormel Foods Corp.	I-6	1/5/1999	Industrial Transfer
423	Coleridge, Village of	MNI-22	1/22/2014	Municipal Notice of Intent
261	Waverly, City of	MT-13	9/12/2007	Municipal
262	Cuming County Rural Water District #1	MT-14	6/7/2006	Municipal
263	Pierce, City of	MT-15	7/12/2007	Municipal
264	Madison, City of	MT-16	1/11/2007	Municipal
268	Papillion, City of	MT-18	11/6/2018	Municipal
284	Louisville, City of	MT-23	9/29/2006	Municipal
332	Wayne, City of	MT-24	7/12/2007	Municipal
351	Palmer, Village of	MT-27	10/5/2007	Municipal
375	Broken Bow, City of	MT-35	11/30/2009	Municipal
391	Waverly, City of	MT-38	2/25/2011	Municipal
473	Archer Daniels Midland Company and Vantage Corn Processing, LLC	I-25	5/1/2020	Industrial Transfer

3. NeDNR Surface Water and Groundwater Permitting Activities

A. Surface Water Permitting Activity

Details of surface water permitting activities are provided in Table 8 through Table 16. To summarize, the following surface water permitting activities occurred in 2021:

- Irrigation (IR) – Nine permits were approved. Seven were within the Basin and two were outside of the Basin. Six permits were cancelled; all were within the Basin.
- Manufacturing Permits (MF) — three temporary (one year) manufacturing permits were approved in the basin for road construction. Outside of the Basin, two temporary manufacturing permits were approved; one was for repair of an Offutt Airforce Base runway.
- Three manufacturing permits from 2020 expired in 2021.
- Municipal Permits (MU) — One permit was granted and one was a temporary permit that was cancelled in 2021. Both permits were outside of the Basin.
- Storage-Only Permits (SO) — Within the Basin, three permits were granted and four were cancelled.
- Storage Permits (ST) — Within the Basin, one permit was granted and one was cancelled.
- Supplemental Irrigation (SI) – One permit was granted and none were cancelled.
- Transfers – one non-expedited and 18 expedited transfers were approved.
- Irrigation District Filings–Twin Loups Reclamation District filed eight Relinquishments and Reassignments. Farwell Irrigation District approved a District Transfer involving 14 surface water permits.

New Surface Water Appropriations Granted in 2021

Table 8 contains the surface water applications approved from January 1, 2021, to December 31, 2021, within the Lower Platte Basin Coalition NRDs and the area within the Lower Platte Basin. Permit use codes within the table are as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation
- MF (Manufacturing) is a permit to divert water for manufacturing, construction, or industrial uses
- MU (Municipal) is a permit to divert water for municipal uses
- SO (Storage-only) is a permit to divert from a reservoir for irrigation, on lands not covered by a natural flow appropriation
- ST (Storage) is a permit to store water
- SI (Supplemental Irrigation) is a permit to divert water from a reservoir for irrigation, on lands that are also covered by a natural flow appropriation.

Table 9 provides a listing of new surface water applications that were approved within the seven NRDs in calendar year 2021 but are outside of the Lower Platte Basin. While the permits do not count as new uses within the Basin, these are included to meet the reporting requirements for those NRDs' Integrated Management Plans.

Table 8. Surface water applications approved in 2021 within the Lower Platte River Basin

Surface Water Applications Approved January 1, 2021 to December 31, 2021										
NRD	Appropriation Number	Date Approved	Source	Diversion/ Reservoir Location	Sub-basin	Use	Grant (cfs)	Grant in af	Acres	New Acres
Lower Elkhorn	A-19752[1]	3/16/2021	Logan Creek, south, Trib. to	S26-T26N-R1E	Elkhorn River Norfolk to Waterloo	MF	0.89	NA	NA	1.89
	A-19762	6/21/2021	Logan Creek Dredge	S29-T20N-R8E		IR	1.34	NA	NA	1.34
	A-19791	11/15/2021	Elkhorn River	S12-T19N-R7E		IR	1.34	NA	NA	1.34
Lower Loup	A-19722A[2]	1/19/2021	Loup River, North	S12-T16N-R12W	North Loup River	IR	0.34	NA	23.9	23.9
	A-19722B[2]	1/19/2021	Loup River, North	S12-T16N-R12W		IR	0.08	NA	11.5	11.5
	A-19744	4/5/2021	Spring Branch	S6-T16N-R9W	Lower Loup River	IR	0.20	NA	14.3	14.3
	A-19768	6/22/2021	Turkey Creek	S19-T14N-R10W	Middle Loup River	IR	0.61	NA	43.0	43.0
	A-19766	8/18/2021	Calamus Reservoir	S6-T21N-R16W	North Loup River	SO	NA	67.8	22.6	NA
	A-19767[3]	8/18/2021	Davis Creek Reservoir	S30-T17N-R12W		SO	NA	67.8	22.6	NA
Lower Platte North	A-19753	3/8/2021	Platte River, Trib. to	S32-T17N-R2E	Lower Platte River Above North Bend	IR	0.17	NA	NA	11.9
Lower Platte South	A-19760[1]	4/28/2021	Butch Cassidy Pond	S5-T8N-R7E	Lower Platte River North Bend to Louisville	MF	NA	10.00	NA	NA
	A-19765[1]	4/28/2021	Salt Creek, Trib. to	S5-T8N-R7E		ST	NA	10.00	NA	NA
	A-19779[1]	6/14/2021	Salt Creek	S1-T8N-R6E		MF	NA	4.9	NA	NA
Upper Elkhorn	A-19739A	3/24/2021	Kerkman's Cove Reservoir	S21-T24N-R6W	Elkhorn River Above Norfolk	SI	NA	177.2	156.4	NA
	A-19739B	3/24/2021	Kerkman's Cove Reservoir	S21-T24N-R6W		SO	NA	177.2	1.0	NA

[1] A-19752, A-19760, A-19765, and A-19779 are temporary permits that will expire one year from approval date.
[2] A-19722 is shown as two records in NeDNR's records for the purpose of water administration. A-19722A is the portion of the appropriation that is on land not already covered by a surface water appropriation. A-19772B provides additional water to land already approved for irrigation under A-2660.
[3] A-19767 acres are covered by acres in A-19766 with two different water sources (Calamus and Davis Reservoirs).

Table 9. Surface water applications approved in 2021 outside of the Basin

Surface Water Applications Approved between January 1, 2021, to December 31, 2021 (Outside of the Lower Platte River Basin but Within Coalition NRDs)									
NRD	Appropriation Number	Date Approved	Source	Diversion/ Reservoir Location	Sub-basin	Use	Grant (cfs)	Grant (af)	Acres
Lower Platte South	A-19750	3/1/2021	Weeping Water Creek	S13-T10-R12E	Weeping Water Creek	IR	1.21	NA	84.6
	A-19733	7/9/2021	Weeping Water Creek, North Branch, Trib to	S32-T11-R13E	Weeping Water Creek	IR	1.56	NA	109.0
Papio-Missouri River	A-19758[1]	3/31/2021	Offutt AFB Lake	S7-T13N-R14E	Missouri River	MF	NA	36.0	NA
	A-19746	3/25/2021	Missouri River	S23-T15N-R13E	Missouri River	MF	15.6	NA	NA
	A-19763	7/26/2021	Ponca Creek	S18-T16N-R13E	Missouri River	MU	0.17	NA	NA

[1] A-19758 is a temporary permit that will expire one year from approval date.

Expired and Cancelled Surface Water Appropriations in 2021

Table 10 provides a listing for Basin surface water appropriations that expired, were cancelled in full, or cancelled in part in 2021. Table 11 lists those expired or cancelled appropriations that are outside of the Lower Platte River Basin but within Coalition NRDs. NeDNR must follow statutory requirements when proceeding with any cancellation, in full or in part, of a surface water appropriation. The "Basis for Action" columns in both tables pertain to one of the authorities listed below.

- BUC (Beneficial Use Cancellation): The field offices investigate all new appropriations after the time period given in the approval order to perfect the water right. If for any reason the appropriation had not been perfected, and water has not been put to beneficial use as stated in the approval order, it may be cancelled in full or in part.
    - Authority upon which the action was based: *Neb. Rev. Stat.* §46-229.02(7) "A water appropriation that has not been perfected pursuant to the terms of the permit may be canceled by the department without complying with sections 46-229.01 to 46-229.04 if the owner of such appropriation fails to comply with any of the conditions of approval in the permit, except that this subsection does not apply to appropriations to which subsection (2) of section 46-237 applies."
- PDNU (Preliminary Determination of Non-use): After a field investigation found the appropriation had not been used in the last five years, and the owner did not successfully contest the preliminary determination of nonuse.
    - Authority upon which the action was based: *Neb. Rev. Stat.* §§ 46-229.02(1) through 46-229.02(6) which state that if the NeDNR makes a preliminary determination that an appropriation has not been used for more than five consecutive years, and the owner of said appropriation does not successfully contest the determination, then NeDNR may cancel said appropriation in whole or in part.
- REL (Relinquishment): Appropriator filed a voluntary relinquishment of water appropriation.
    - Authority upon which the action was based: Department of Natural Resources *Rules for Surface Water, Neb. Admin. Code. Title 457*, Chapter 3, which specifies that any appropriation, or part of any appropriation, may be voluntarily relinquished.
- Temporary permits: Temporary permits may not be granted for a term of more than one year. These permits expire one year from the order date and are cancelled without further action by the Department as of that date.

Table 10. Expired or cancelled surface water appropriations in 2021 within the Lower Platte River Basin

Surface Water Appropriations Expired, Cancelled in Full or Cancelled in Part from January 1, 2021 to December 31, 2021												
NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Diversion Location	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Cancelled Grant (af)	Estimated Last Use	Basis for Action
Lower Loup	A-2051C	2/16/2021	Mud (Beaver) Creek	Cancelled in Full	S31-T15N-R17W	IR	10.5	10.5	0.15	NA	Never used	PDNU-8949
	A-3870[1]	3/23/2021	Loup River	Cancelled in Full	S6-T16N-R4W	SO	74.2	18.4	NA	0.00	2007	REL-9290
	A-14765	12/21/2021	Turtle Creek	Cancelled in Full	S31-T20N-R14W	IR	320.0	265.0	3.79	NA	1982	REL-9470
	A-19493	12/21/2021	Oak Creek	Cancelled in Full	S22-T15N-R13W	IR	11.7	11.7	0.17	NA	1964	BUC-9478
	A-14623	4/28/2021	Loup River	Cancelled in Part	S6-T16N-R4W	IR	117.5	112.2	1.6	NA	1995	REL-9366
	A-16915	3/23/2021	Loup River	Cancelled in Part	S6-T16N-R4W	IR	134.5	44.0	0.26	NA	1995	REL-9332
	A-19425	3/10/2021	Calamus Reservoir	Cancelled in Part	S6-T21N-R16W	SO	143.9	37.5	NA	0.00	2017	BUC-9321
	A-19472	3/10/2021	Calamus Reservoir	Cancelled in Part	S6-T21N-R16W	SO	133.0	7.0	NA	0.00	Never Used	BUC-9622
	A-19535	3/10/2021	Davis Creek Reservoir	Cancelled in Part	S30-T17N-R12W	SO	34.7	12.0	NA	0.00	Never Used	BUC-9323
	A-19726	9/4/2021	Loup River	Expired	S24-T17N-R2W	MF	NA	NA	0.20	10.0	2020	Temp Permit
Upper Loup	A-16918B	2/26/2021	Loup River, Middle	Cancelled in Full	S6-T24-R32	IR	10.0	10.0	0.14	NA	2014	REL-9325

[1] A-3870 was divided into A-3870A with 55.0 acres & 45 AF and A-3870B with 0.8 acres & 45 AF, the remaining 18.4 acres were cancelled through relinquishment REL-9290.

Surface Water Appropriations Expired, Cancelled in Full or Cancelled in Part from January 1, 2021 to December 31, 2021												
NRD	Permit Number	Cancelled Date	Source	NeDNR Action	Diversion Location	Use	Begin Acres	Cancelled Acres	Cancelled Grant (cfs)	Cancelled Grant (af)	Estimated Last Use	Basis for Action
Lower Platte North	A-19778[1]	7/26/2021	Clear Creek	Dismissed	S22-T15N-R9E	ST	NA	NA	NA	550	Never used	NA
Lower Platte South	A-19703	5/15/2021	Salt Creek	Expired	S1-T8N-R6E	MF	NA	NA	4.90	NA	2020	Temp Permit
	A-19713	5/27/2021	Salt Creek, Trib to	Expired	S2-T8N-R6E	MF	NA	NA	4.90	NA	2020	Temp Permit

Table 11. Expired or cancelled surface water appropriations, outside of the Basin

NRD	Permit Number	Canc-elled Date	Source	NeDNR Action	Location of Diversion	Use	Begin Acres	Canc-elled Acres	Canc-elled Grant (cfs)	Estimated Year of Last Use	Basis for Action
Papio-Missouri River	A-19731[2]	7/26/2021	Ponca Creek	Cancelled in Full	S18-T16N-R13E	MU	NA	NA	0.29	2021	REL-9370

[1] A-19778 was dismissed because it was filed incorrectly as an Application for a Permit to Appropriate Water rather than as an Application for a Permit to Impound Water.

[2] A-19731 is a temporary permit that will expire one year from approval date.

Transferred Surface Water Permits in 2021

Table 12 summarizes the appropriation granted a "Non-Expedited" transfer, while Table 13 summarizes appropriations granted an "Expedited Transfer." The permit use code used in Table 12 and Table 13 is defined as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation

According to *Neb. Rev. Stat*. §46-291(1) "Expedited Transfers" are restricted to the following but not limited to: appropriations that are for irrigation; no increase in the number of acres; location of use may only change to adjacent lands; and the point of diversion may not change significantly.

Table 12. Appropriation(s) approved for a change of appropriation (non-expedited transfer)

Surface Water Appropriations Approved for Non-expedited Transfer January 1, 2021 to December 31, 2021									
NRD	Permit Number	Approval Date	Source	Use	Diversion Location	Acres Trans-ferred	Grant Transferred (cfs)	Increase in Acres?	Application Number
Lower Elkhorn	A-3200B	7/26/2021	Mud (Beaver) Creek	IR	S32-T15-R17W	22.9	0.33	No	NEX-9409

Table 13. Appropriations granted a location of use transfer (expedited transfer)

Surface Water Appropriations Approved for an Expedited Transfer from January 1, 2021 to December 31, 2021									
NRD	Permit Number	Approval Date	Source	Use	Diversion Location	Acres Transferred	Grant (cfs) Transferred	Increase in Acres?	Application Number
Lower Elkhorn	A-12427	6/21/2021	Union Creek	IR	S3-T21N-R1W	65.0	0.93	No	EXT-9240
	A-15281	11/15/2021	Elkhorn River	IR	S12-T19N-R7E	105.0	1.50	No	EXT-9451
Lower Loup	A-2051A	5/13/2021	Mud (Beaver) Creek	IR	S31-T15N-R17W	83.8	1.19	No	EXT-9355
	A-13823	7/26/2021	Turkey Creek	IR	S20-T14N-R10W	87.0	1.24	No	EXT-9381
	A-6993	7/26/2021	Cedar River	IR	S24-T17N-R7W S25-T17N-R7W	148.7	1.06	No	EXT-9387
	A-3881	8/4/2021	Deer Creek, Trib. to	IR	S8-T13N-R19W	110.3	1.0	No	EXT-9390
	A-18990	8/4/2021	Deer Creek, Trib. to	IR	S8-T13N-R19W	110.3	0.58	No	EXT-9391
	A-14918R	9/13/2021	Loup River, South	IR	S20-T14N-R20W S21-T14N-R20W	143.0	2.04	No	EXT-9396
	A-6487	9/28/2021	Cedar River	IR	S36-T18N-R7W	61.0	0.44	No	EXT-9015
	A-2794BR	9/28/2021	Mud (Beaver) Creek	IR	S25-T15N-R18W	48.65	0.35	No	EXT-9400
	A-11210	10/12/2021	Cedar River	IR	S1-T19N-R9W	92.5	1.32	No	EXT-9399
	A-4095R	10/14/2021	Cedar River	IR	S13-T17N-R7W	142.0	1.02	No	EXT-9444
	A-17316R	11/1/2021	Mud (Beaver) Creek	IR	S32-T15N-R17W S5-T14N-R17W	25.0	0.36	No	EXT-9410
	A-15004	11/1/2021	Cedar River	IR	S4-T16N-R6W	40.0	0.57	No	EXT-9427
	A-8729BR	11/1/2021	Cedar River	IR	S4-T16N-R6W	132.0	1.89	No	EXT-9428
Lower Platte North	A-4726	5/25/2021	Platte River, Trib. to	IR	S32-T17N-R2E	45.0	0.32	No	EXT-9330
	A-17623	5/25/2021	Platte River, Trib. to	IR	S32-T17N-R2E	45.0	0.32	No	EXT-9331
Lower Platte South	A-17206[1]	10/19/2021	Reservoir 15B	IR	S32-T11N-R13E	43.41	NA	No	EXT-9392

[1] Permit A-17206 is irrigated from a reservoir with a 30.7 af grant annually, which did not transfer. This permit is also outside the Basin, but within LPSNRD.

Surface Water Irrigation District Filings with NeDNR

In 2021, the Twin Loups Reclamation District (Twin Loups) filed eight "Relinquishments and Reassignments" with NeDNR. These are listed in Table 14, and are grouped by water source in Table 15. Here, Twin Loups is exercising the latitude provided by *Neb. Rev. Stat.* § 46-229.04 (5) to file, with NeDNR, provisional relinquishments and reassignments of district land. These reassignments must occur within five years after an order of cancellation issued by the department following the filing of a voluntary relinquishment of the water appropriation; to assign the right to use that portion of the appropriation to other land within the district or the area served by the company. The department shall be notified of any such assignment within thirty days after such assignment. Such appropriators are bound by all terms and conditions set forth in the appropriation, and in no way does this relinquishment/reassignment allow any increase in the number of acres irrigated by surface water. Table 16 summarizes District Transfer DST-7883[1]. No other types of transfers were acted upon in 2021.

[1] Pursuant to *Neb. Rev. Stat.* §§ 46-2,127 through 46-2,130 "After obtaining approval of an application for transfer and map pursuant to sections 46-2,122 to 46-2,126, the board of directors of any irrigation district, reclamation district, public power and irrigation district, rural water district, or mutual irrigation or canal company may transfer an appropriation of water distributed for agricultural purposes from a tract or tracts of land within the district or served by the company to another tract or tracts of land within the boundaries of the district or served by the company…" The Department does not issue an order for this action. The appropriator is responsible for following statutory requirements related to this type of transfer.

Table 14. Twin Loup Reclamation District 2021 filings

Provisional Relinquishments and Reassignments Filed by Twin Loups Reclamation District							
Permit Number	Source	Provisional Relinquishment	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Reassign-ment	Acres Reassigned	Grant Reassigned
A-9642	Calamus River	PREL-9178	174.7	2.5	REA-9188	235.0	3.36
A-15088	Loup River, North	PREL-9179	174.7	2.5	REA-9189	235.0	3.36
A-17890R	Calamus River	PREL-9180	18.0	0.26	REA-9190	18.0	0.26
A-17602	Calamus Reservoir	PREL-9181	101.7	NA	REA-9191	122.4	NA
A-17105	Davis Creek Reservoir	PREL-9182	39.2	NA	REA-9192	39.2	NA
A-18290	Calamus Reservoir	PREL-9183	73.0	NA	REA-9193	112.6	NA
A-18291	Davis Creek Reservoir	PREL- 9185	41.9	NA	REA-9195	41.9	NA
A-19536	Calamus Reservoir	PREL-9187	21.3	NA	REA-9197	21.3	NA

Table 15. Twin Loup Reclamation District's 2021 filings grouped by water source

Twin Loups Reclamation District Provisional Relinquishments and Reassignments Filings by water source				
Water Source	Acres Provisionally Relinquished	Grant Provisionally Relinquished (cfs)	Acres Reassigned	Grant Reassigned
Calamus River	192.7	2.76	253	3.62
Loup River, North	174.7	2.5	235	3.36
Calamus Reservoir	196	NA	256.3	NA
Davis Creek Reservoir	81.1	NA	81.1	NA

Table 16. District Transfer Approved by the Loup Basin Reclamation District, Farwell Irrigation District

District Transfer ST-9306: Approved on April 7, 2021 by Loup Basin Reclamation District, Farwell Irrigation District				
Associated Permit Numbers	Use	Source	Total Number of Acres Transferred Out	Total Number of Acres Transferred In
A-4423	IR	Loup River, Middle	159.9	159.9
A-18311	SI	Sherman Reservoir		
A-18310	IR	Loup River, Middle		
A-15660	IR	Turkey Creek		
A-17307	SI	Sherman Reservoir		
A-5710	IR	Loup River, Middle		
A-10470	IR	Loup River, Middle		
A-16399	IR	Loup River, Middle		
A-16806	IR	Loup River, Middle		
A-17306	IR	Loup River, Middle		
A-4423A	IR	Loup River, Middle		
A-10260A	SI	Sherman Reservoir		
A-16400	SI	Sherman Reservoir		
A-16814	SI	Sherman Reservoir		

B. Groundwater Permitting Activity

The following is a listing of all the types of groundwater permits authorized by statute to be issued by NeDNR. In 2021, NeDNR had no groundwater permitting activity within the Basin for the following uses:

- Application to Drill Without Regard to Spacing —No cancellations or new permits issued
- Industrial Groundwater Transfers —No cancellations or new permits issued
- Industrial Transfer Notice —No cancellations or new permits issued
- Municipal Groundwater Transfers —No cancellations no new permits
- Municipal Notice of Intent —No cancellations or new permits issued
- Permit to Violate Well Spacing —No cancellations and no new permits were
- Permit to Transfer to Adjoining State —No cancellations or new permits issued

4. Estimated Stream Depletions for New Surface Water Permits

The Plan provides an overview of the agreed-upon methodology to calculate stream depletions for newly permitted irrigated acres. NeDNR calculated stream depletions for new surface water uses and acres using this methodology. More details on the new permits are provided above in Chapter 3, Table 8.

The net stream depletion estimates by NRD are provided in Table 177. For permits with new acres, the Net Irrigation Requirement (NIR), based on corn, was applied. For the new acres within the Lower Loup NRD, the NIR was based on averaged 1996 to 2020 values computed for the CENEB model. For new acres within the Lower Elkhorn and Lower Platte North NRDs, the NIR was based on averaged 1988 to 2012 values. There were no permits with new acres in the remaining NRDs. All permits with a use of "SO" are to divert water from a reservoir for irrigation; therefore, depletions to streamflow are consider to occur in the non-peak season.

The permit use codes shown in Table 17 are defined as follows:

- IR (Irrigation) is a permit to divert water from natural flow for irrigation
- MF (Manufacturing) is a permit to divert water for manufacturing, construction, or industrial uses
- SO (Storage-only) Irrigation from a reservoir on lands not covered by a natural flow appropriation
- ST (Storage) is a permit to store water
- SI (Supplemental Irrigation) is a permit to divert water from a reservoir for irrigation, on lands that are also covered by a natural flow appropriation.

Table 18 shows accretions that occurred in 2021. Accretions may be due to 1) any new permits reported in 2016 or later, but had since expired, or 2) other permits that were granted but not used since the plan implementation date. Table 19 provides a summary of depletions and accretions that have been reported since 2016, which marked the first year of reporting for the Plan.

Table 17. Estimated stream depletion by NRD for newly permitted surface water uses and acres

Estimated Stream Depletion for New Surface Water Permits between January 1, 2021 and December 31, 2021								
NRD	Permit Number	Use	Sub-basin	Net Irrigation Requirement (In)	Permitted Acres	Annual Consumptive use in acre feet (af)	Peak Season Depletion (af)[1]	Non-Peak Season Depletion (af)[1]
Lower Elkhorn	A-19752[2]	MF	Elkhorn River Norfolk to Waterloo	Grant = 10.0 af	NA	10.0	10	0
	A-19762	IR		4.89	94.1	94.1* 4.89 = 459.77 ac-in 459.77/12 = 38.31	38	0
	A-19791	IR		5.91	94.1	94.1* 5.91= 556.04 ac-in 556.04/12 = 46.34	46	0
Lower Loup	A-19722A	IR	North Loup River	7.44	23.9	23.9* 7.44= 177.94 ac-in 177.94/12 = 14.83 ac-ft	15	0
	A-19722B[3]	IR		NA	11.5	0.00	0	0
	A-19744	IR	Lower Loup River	7.06	14.3	14.3* 7.06 = 100.96 ac-in 100.96/12 = 8.41	8	0
	A-19768	IR	Middle Loup River	6.325	43.0	43.0* 6.32 = 271.98 ac-in 271.98/12 = 22.66	23	0
	A-19766[4]	SO	North Loup River	7.236	22.6	22.6*7.24=163.53 ac-in 163.53/12 = 13.63 ac-ft	0	14
	A-19767[5]	SO		NA	22.6	0.00	0	0
Lower Platte North	A-19753	IR	Lower Platte R. Above North Bend	7.542	11.9	11.9* 7.54 = 89.75 ac-in 89.75/12 = 7.48	7	0
Lower Platte South	A-19760[2]	MF	Lower Platte R. North Bend to Louisville	Grant = 10.0 af	NA	10.0	10	0
	A-19765[2]	ST		Grant = 10.0 af	NA	10.0	0	10
	A-19779[2]	MF		Grant = 4.9 af	NA	4.9	5	0

[1] Peak season, non-peak season, and total depletions are rounded to the nearest whole number, after calculations where applicable.
[2] A-19752, A-19760, A-19765, and A-19779 are temporary permits that will expire one year from the approval date.
[3] A-19772B acres are already approved for irrigation under A-2660. A-2660 has a priority date of 11/14/1936.
[4] A-19766 reallocates storage use water from appropriation A-9517 (Calamus Reservoir).
[5] A-19767 acres are the same acres in A-19766, this permit adds a second source of water, Davis Creek Reservoir (A-9518R).

Estimated Stream Depletion for New Surface Water Permits between January 1, 2021 and December 31, 2021								
NRD	Permit Number	Use	Sub-basin	Net Irrigation Requirement (In)	Permitted Acres	Annual Consumptive use in acre feet (af)	Peak Season Depletion (af)[1]	Non-Peak Season Depletion (af)[1]
Upper Elkhorn	A-19739A[1]	SI	Elkhorn River Above Norfolk	NA	156.4	0	0	0
	A-19739B[2]	SO		4.667	1	1.00*4.67=4.67 ac-in 4.67/12 = 0.39	0	0
						Total	**163**	**24**

Table 18. Estimated accretions for previously taken depletions that no longer occur

Estimated Stream Accretions (Corrections) for Previously Taken Depletions that No Longer Occur								
NRD	Permit Number	Use	Sub-basin	Acres	Year(s) Depletion was Taken	Original Depletion Peak/Non-Peak (af)	Resulting Stream Accretion (af)-Peak	Resulting Stream Accretion (af)-Non-Peak
Lower Platte South	A-19703[3]	MF	Lower Platte R. North Bend to Louisville	NA	2020	2.0/0	2	0
	A-19733[4]	MF	Lower Platte R. North Bend to Louisville	NA	2020	0/0	0	0
Lower Loup	A-19726	MF	Lower Platte R. above North Bend	NA	2020	10.0/0	10	0
						Total	**12**	**0**

[1] A-19739A provides supplemental water to land previously approved for irrigation under natural flow appropriation A-19678.
[2] A-19739B is a storage use right from appropriation A-10129.
[3] The volume for A-19703 was extrapolated from water quantity data provided by the appropriator.
[4] A-19703 and A-19733 were issued to the same appropriator. Only A-19703 was used.

Table 19. 2016 to 2021 estimated surface water stream depletions and accretions

2016-2021 Estimated Stream Depletions and Accretions for New Surface Water Permits																		
NRD	2016-2017		2018		2019				2020				2021				Net Total Depletions[1]	
	Depletions		Depletions		Depletions		Accretions		Depletions		Accretions		Depletions		Accretions			
	Peak	Non-Peak[2]	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak	Peak	Non-Peak
Lower Elkhorn	117	NA	97	0	70	60	0	0	0	0	103.6	0	94.65	0	0	0	275	60
Lower Loup	0	NA	305	0	130	638	0	0	46	339	0	0	45.91	13.63	10.0	0	517	991
Lower Platte North	0	NA	0	0	0	0	0	0	0	61	0	0	7.48	0	0	0	7	61
Lower Platte South	65	NA	10	0	0	0	10	0	2	18	0	0	14.90	10.00	2.0	0	80	28
Papio-Missouri River	67	NA	0.3	0	10	0	0	0	0	0	10.3	0	0	0	0	0	67	0
Upper Elkhorn	0	NA	0	0	0	0	0	0	85	0	0	0	0.39	0	0	0	85	0
Upper Loup	118	NA	345.32	89.41	0	0	65	0	9	0	38	89	0	0	0	0	369	0
Basin Total[1]	**367**	**NA**	**758**	**89**	**210**	**698**	**75**	**0**	**142**	**418**	**152**	**89**	**163**	**24**	**12**	**0**	**1401**	**1140**

[1] Net total depletions by NRD and by Basin have been rounded to the nearest whole number, after calculations.
[2] Non-Peak season depletions were not calculated for the 2016-2017 report for any of the new surface water uses in any NRD and have not been evaluated at this point in time.

5. Basin Plan Implementation: Research, Projects and Studies

A. Coalition annual reporting database

One of the most important aspects of Basin management is annual reporting and data sharing between Basin NRDs and NeDNR. Since development of the Basin Plan, the Coalition has been working with HDR, Inc. to create an annual reporting database and tools to improve consistency of data storage and data sharing between Coalition members[1]. The database and tools will help standardize the reporting of new uses and will thus ensure data integrity and transferability between sources. The integrated groundwater and surface water database will be an asset to future analyses of Basin water uses and water supplies, including determining allowable depletions for future Basin Plan increments, and aiding data assimilation for the Plan's 5-year comprehensive review.

The tool is being designed with added capabilities to assist NeDNR in reporting Basin and statewide of non-irrigation water use for the USGS Water Census. As such, the USGS has provided grant funding towards tool development. Having an annual reporting database with the flexibility and capabilities for multiple purposes helps to reduce redundancy as many reporting initiatives have overlapping components.

B. Required 5-year comprehensive review (INSIGHT analysis)

The 5-year comprehensive review was completed in 2021. This project was accomplished with the efforts of all coalition members as well as hired consultants The Flatwater Group (TFG) and HDR to manage much of the task. Three investigations of the balance of water uses and water supplies were reviewed by the technical committee and the management committee in October and November of 2021. These three variations included the results of the analysis from calendar year 2012 (25-year period), the same method applied to the most recent 25-year period, and the same method applied to a 33-year period (data from last 25-year analysis plus new data through 2020) (188,077 AF, 242,319 AF, and 228,547 AF respectively). After considerable discussion of the merits of all 3 investigations of the water balance, the management committee voted to recommend that the most recent 25-year period be used to set the allowable development allotments for the next 5-year increment. Additionally, the management committee voted to recommend that in the next 5-year increment, the Coalition include a review of the drought actions currently being pursued by each Coalition member. These recommendations will be presented to the Coalition Board for consideration at their April 2022 meeting.

[1] Goal 1, Objective 2, Action Item A: Develop a standard data collection and reporting system for all NRDs in the Lower Platte River Basin for documenting water uses in the Basin.

C. Groundwater modeling and studies

Lower Platte Missouri Tributaries (LPMT) Model and Studies[1]

Regional LPMT Model Development

In December 2018, NeDNR completed development of the Lower Platte Missouri Tributaries (LPMT) regional groundwater model which covers the northern and central portions of eastern Nebraska. It is the first numerical groundwater model for this region, and it provides a scientific basis to evaluate aquifer-stream interactions along the Lower Platte and Elkhorn Rivers and tributaries.

As part of the future development and improvements to the LPMT model, the NRDs are working to develop locally gathered AEM data and transform that data into information that can be utilized by the LPMT regional groundwater model. Below are descriptions of those projects.

Lower Elkhorn NRD Modeling and AEM Investigation

The LENRD and the NeDNR are nearing completion of a contract with JEO Consulting Group (JEO) to develop a district-wide groundwater model that incorporates airborne electromagnetic (AEM) hydrogeologic data previously collected by the NRD. A pilot-scale model completed in spring 2020 is being used to inform this model's development. At this time, the calibration phase is nearing completion, and model development is expected to be completed in Spring 2022.

Lower Platte North NRD Modeling and AEM Investigation

In 2021, NeDNR worked with the School of Natural Resources, University of Nebraska-Lincoln to secure a second graduate assistantship to continue work on integration of AEM data into future hydrogeologic interpretations. The graduate student is investigating the use of AEM data to refine the geologic framework within a LPNNRD-specific groundwater model. The results of this work will inform NeDNR and the NRDs on best uses of AEM data within modeling frameworks, and what level of detail is appropriate for integration with groundwater models.

In 2021, progress was made in generating new inversions of raw AEM data, and multiple point statistics were used to generate a hydrologic framework for the model. At this time, a groundwater model is being constructed within this framework, while utilizing inputs from the Lower Platte Missouri Tributaries (LPMT) regional model. This LPNNRD AEM-refined groundwater model is scheduled for completion in Spring 2023.

[1] Goal 1, Objective 1.4, Action Item A: Utilize best available data and tools to develop refined extents of the hydrologically connected ground and surface waters in the Lower Platte River Basin.

Papio-MR NRD & LPNNRD Modeling and AEM Investigation

The Papio-Missouri River NRD, Lower Platte North NRD, and NeDNR have begun work on development of a hydrologic framework based on AEM flight data within the two NRDs. This work is being conducted by LRE, the same contractor who developed the framework for LENRD, and is utilizing the same methodology as the LENRD hydrologic framework. This project is currently undergoing final review and is scheduled for completion in Spring 2022. Next steps would follow on the work of the LENRD to move the AEM data into a sub-regional model for these NRDs.

Lower Platte South AEM Hydrogeologic Framework Project

In December 2021, LPSNRD received notification that the Natural Resources Commission had approved the District's application for a Water Sustainability Fund (WSF) grant in the amount of $247,500 for the "Lower Platte South NRD Three-Dimensional Hydrogeologic Framework Project." This grant will be matched by $165,000 of LPSNRD funds to bring the total project cost to $412,500 (60% WSF, 40% LPSNRD) for the two-year project.

This project represents the next step in utilization of the airborne electromagnetic (AEM) data collected by the Lower Platte South NRD and other Districts (especially those involved in ENWRA) since 2006 and builds on experience and knowledge gained in the past few years by other NRDs such as Lower Elkhorn, Papio-Missouri River, and Lower Platte North, in similar projects. It will result in a three-dimensional geologic framework for the entire LPSNRD with emphasis on priority aquifers and Wellhead Protection Areas, will prepare existing AEM and other datasets for entry into advanced numerical groundwater models, and will provide a detailed set of recommendations for additional work and analysis.

CENEB / ELM Regional Model Comparison

In order to make more informed water management decisions in the Loup and Elkhorn River Basins, NeDNR is working with the UENRD, LENRD, ULNRD, LLNRD and Olsson Associates to compare two previously developed regional groundwater models[1]. These models are the Central Nebraska (CENEB) model developed by NeDNR and the Elkhorn Loup Model (ELM) developed by USGS.

CENEB is used by NeDNR to assess groundwater use impacts to streamflow in the region, while ELM is used by LLNRD and ULNRD to assess groundwater management actions. One aspect of the comparison is to evaluate similarities and differences in CENEB and ELM data sourcing, model design and input datasets. The investigation also evaluates modeled water budgets and scenarios to better understand how, where, and why the two models differ. In 2021, this project was paused so that the 5-year comprehensive review of the balance of water supplies and uses could be completed by the end of 2021, in accordance with the timeline in the Basin Plan.

[1] Goal 1, Objective 1.4, Action Item A: Utilize best available data and tools to develop refined extents of the hydrologically connected ground and surface waters in the Lower Platte River Basin.

D. Drought Planning

Upper Loup Drought Planning

The Upper Loup NRD is in the beginning stages of drought planning efforts and is working with JEO to identify triggers, interested members, a communication scheme, and other items that are important to get set in early drought planning efforts. NeDNR has offered to assist in the creation of a drought dashboard to accompany ULNRD Planning efforts.

Lower Loup Drought Planning

The Lower Loup NRD has initiated drought planning efforts and is in the process of putting together initial triggers, management actions, staff support, zones within the NRD, along with embarking on other early drought planning efforts. NeDNR will assist the LLNRD in their drought planning efforts as desired.

Lower Platte River Consortium[1]

In 2016, the Lower Platte South NRD, Lower Platte North NRD, Papio-Missouri River NRDs, Omaha Metropolitan Utilities District, Lincoln Water System and NeDNR entered an Interlocal Cooperative agreement (ILCA) to form the Lower Platte River Consortium (Consortium). In 2019, the Consortium finalized the Lower Platte Drought Contingency Plan (LPDCP). The LPDCP looks to monitor and minimize the impacts of drought across the Lower Platte River Basin. Information regarding the Lower Platte Drought Contingency Plan is available here:
https://dnr.nebraska.gov/sites/dnr.nebraska.gov/files/doc/water-planning/lower-platte/LPBasinWide/Coalition/20191031_LPRDCP_Final.pdf.

On August 24, 2021, a drought tabletop exercise was held at Lake Wanahoo facilities in the Lower Platte North NRD. Members from each entity of the Consortium were present. At this tabletop exercise, the Consortium's concerns about drought were discussed, including communication, basin-based actions, and individual entity actions that would occur during conditions identified as trending towards drought.

Also in 2021, NeDNR created a public-facing online dashboard that provides spatially represented hydrologic drought data on an interactive map to support drought monitoring in the Lower Platte River Basin. The dashboard utilizes drought indices, indicators and triggers set forth in the Drought Plan. It is updated on a continual basis and displays real-time data along with best-available data as available from internet sources. The dashboard can be accessed at:
https://gis.ne.gov/portal/apps/experiencebuilder/experience/?id=c0b751c512a24b83a6ad1c3214941ea8

[1] Goal 1, Objective 1.5-Evaluate variations in water inventory due to climate cycles, and Goal 2, Objective 1-Collaborate with state and local governments to identify opportunities to augment water supplies within the Lower Platte River Basin.