

PAPIO-MISSOURI RIVER NRD VOLUNTARY INTEGRATED MANAGEMENT PLAN 2022 ANNUAL REPORT

October 10, 2023, at 4p.m.

Papio-Missouri Rivers NRD Office

8901 S. 154th Street, Omaha, NE 68138

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**PAPIO-MISSOURI RIVER
NATURAL RESOURCES DISTRICT**

Finding Solutions Today for a Secure Tomorrow.

Tyler Martin

IWM Coordinator

NEBRASKA
DEPT. OF NATURAL RESOURCES

2022 IMP OVERVIEW

Assess and review the 2022 IMP process and requirements

- Data collection and monitoring
- Plan goals
- Actions



2014 IMP ADOPTION PMRNRD BOARD AND NEDNR

Four Goals:

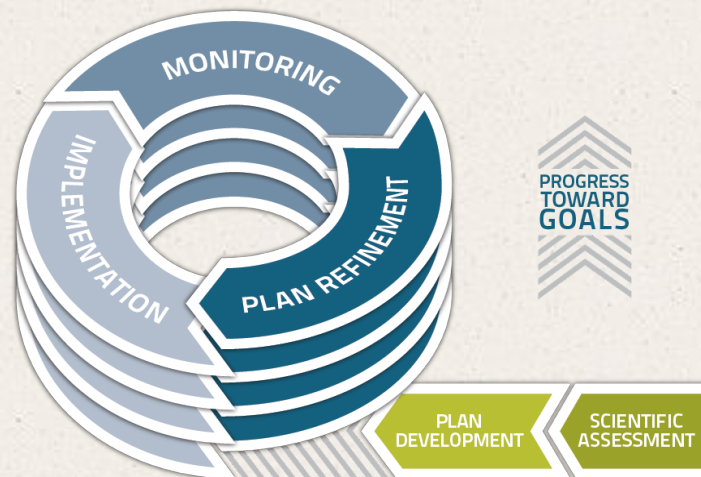
- Water Use Policies and Practices
- Water Supply and Use Inventory
- Water Use Educational Programs
- Basin-wide Water Management Plan



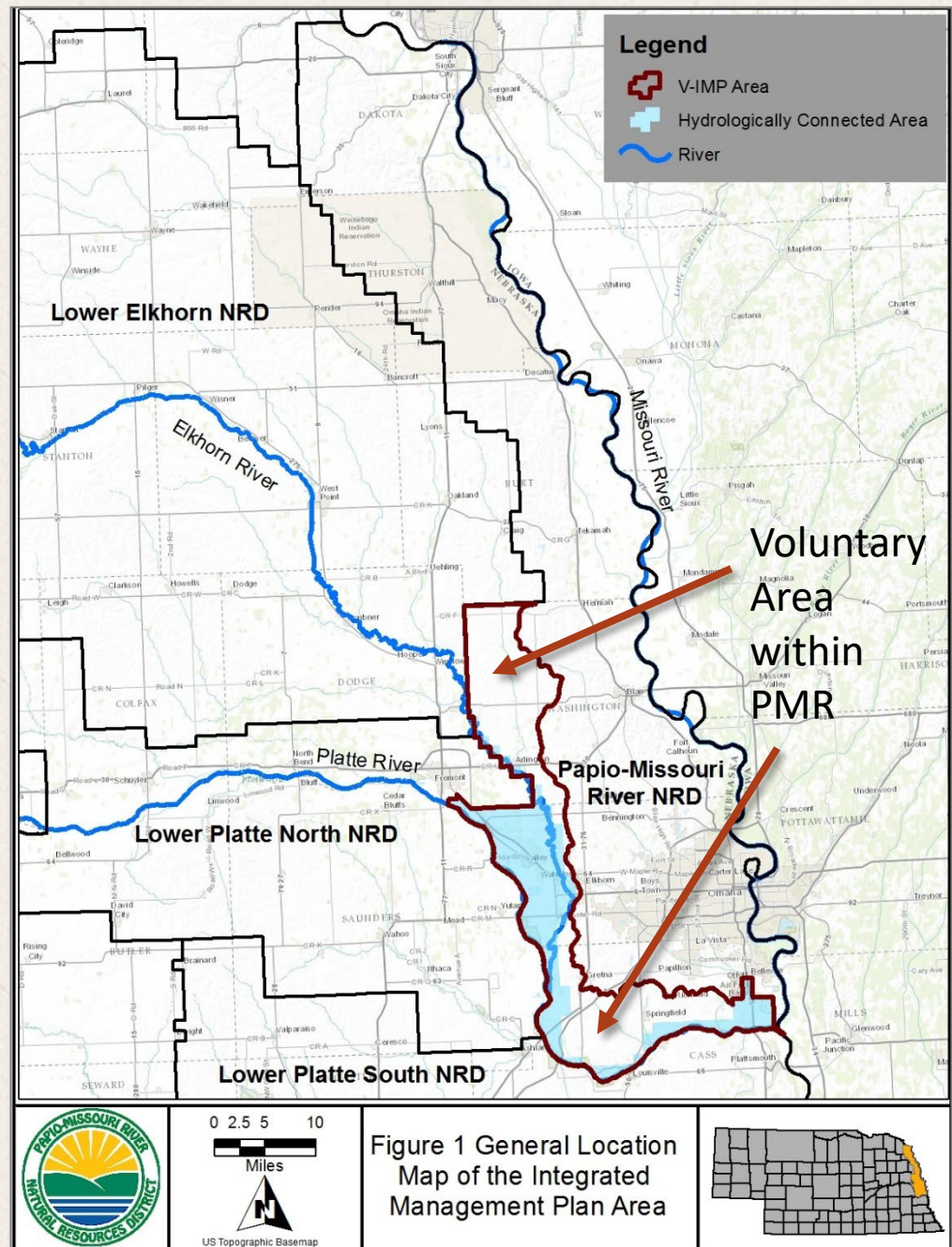
WHY DO WE CONDUCT IMP ANNUAL REVIEWS?

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



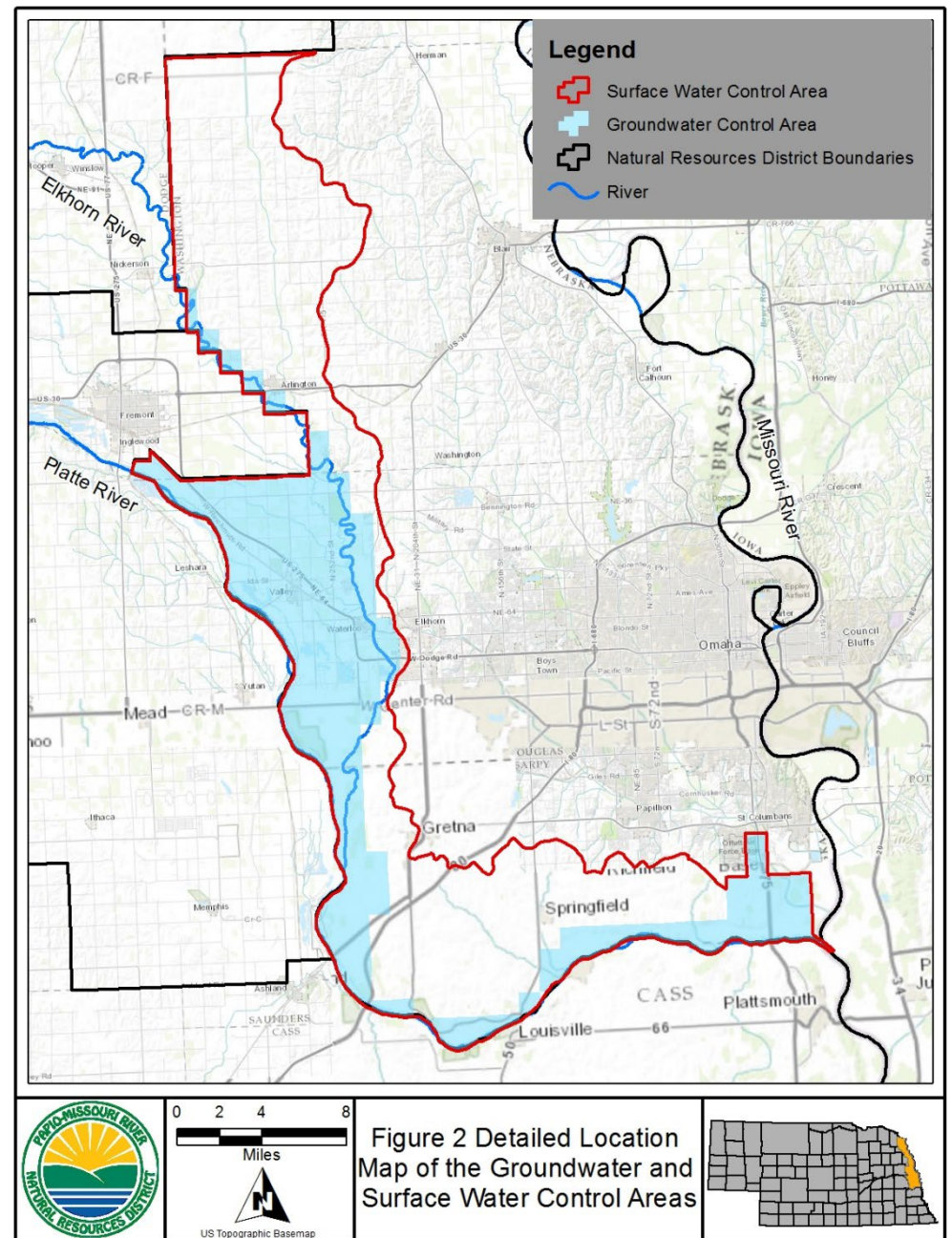
Papio-Missouri River NRD Integrated Management Plan Area



Groundwater and Surface Water Controls

Groundwater irrigated acres expansions in the District follow the agreed to conditions with the Lower Platte River Basin Coalition.

PMRNRD, NeDNR, and other Basin NRDs continue cooperative water development discussions based on the Lower Platte Basin Water Management Plan



NeDNR DATA COLLECTION & MONITORING

NeDNR Monitoring

- Surface water permitting activities
- NeDNR stream gage measurements
- Surface water pump site inspections
- Surface water irrigation use



NeDNR DATA COLLECTION & MONITORING

2022 NeDNR Surface Water Appropriations Approved PMNRD IMP Area

Appropriation Number	Date Approved	Source	Diversion or Reservoir Location	Sub-basin	Use	Grant (cfs)	Grant (af)	Acres
A-19861	8/30/2022	Buffalo Creek, Trib. to	S01-T13N_R10E	Missouri River	ST	NA	18.0	NA

NeDNR DATA COLLECTION & MONITORING

NeDNR 2022 Surface Water Permitting Actions Within the IMP Area
Appropriations Cancelled or Expired

No surface water appropriations cancelled or expired for PMRNRD's IMP area by the NeDNR for the 2022 reporting period.

NeDNR DATA COLLECTION & MONITORING

NeDNR Surface Water Pump Site Inspections, PMRNRD			
Year	SW Points of Diversion	Number of Pumps Inspected	Associated Permitted Acres
2017	51	44	4,812
2018	51	49	5,213
2019	49	1	95.2
2020	53	9	448.0
2021	51	50	5,634
2022	51	26	2,794

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

In 2022, the pump sites were inspected for appropriations.

Of the sites visited, 6 had a pump site set up and 4 were running.

NEEDNR 2022

VOLUNTARY SURFACE WATER REPORTING

- 35 responses from 109 surveys
 - 16 Surface Water only (1729 acres)
 - 4 Co-Mingled (448 acres)
 - 3 No Irrigation (1060 acres)
- 5.4" average inches applied

PMNRD DATA COLLECTION & MONITORING

NRD Monitoring

- Irrigated acres expansion
- Groundwater level measurements
- Municipal water use

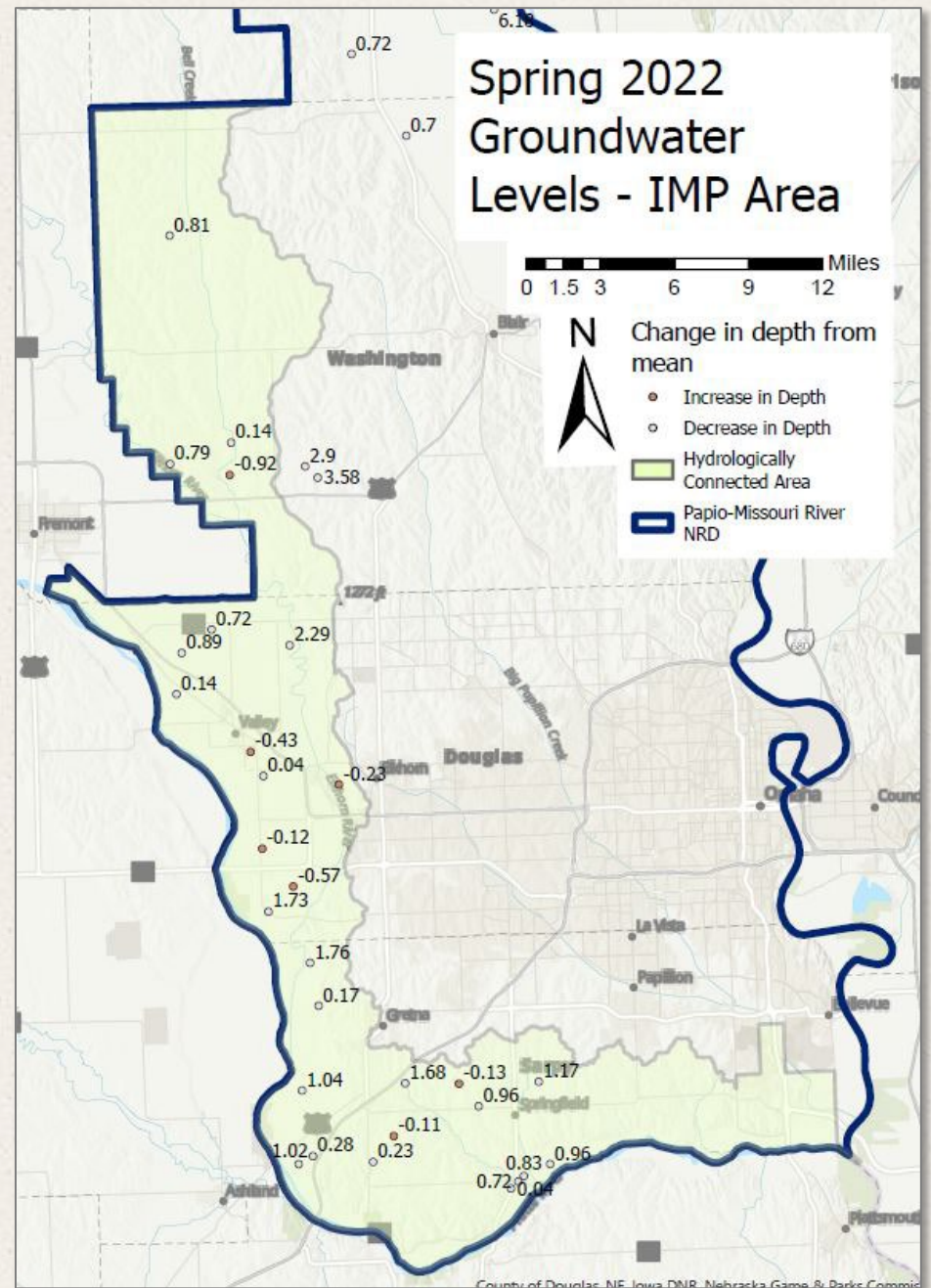


PMNRD DATA COLLECTION & MONITORING

Groundwater Irrigated Acres Expansion PMNRD		
Year	Number of Acres with a Variance (IMP Area)*	Groundwater Peak Depletion (AF)
> July 1, 2016	0	0
2017	11	1.5
2018	0	0
2019	0	0
2020	205	28.5
2021	26	4.0
2022	102.8	14.6
TOTAL	344.8	48.6

PMNRD Data Collection and Monitoring

Spring 2022 Groundwater Level Measurements



PMNRD DATA COLLECTION & MONITORING

Municipal Water Use PMNRD IMP Area						
Municipal Wellfield	Total Pumped (Ac-ft)					
	2017	2018	2019	2020	2021	2022
Papillion	4,661.1	4,482.2	4,655.4	5,807.8	5,656.3	5,883.0
Lincoln	22,115.1	11,866.5	8,246.5	9,007.9	18,561.5	19,753.7
M.U.D. South	27,217.2	31,104.3	36,201.0	35,701.3	30,554.0	
M.U.D. West	12,225.1	10,741.7	9,861.9	12,706.1	14,042.8	13,707.0
Fremont	4,987.4	5,395.3	5,719.6	7,262.3	7,960.5	8,694.3
Valley	469.3	506.3	537.3	740.4	713.9	862.1
Springfield	183.8	202.3	188.7	232.0	243.0	368.8
Gretna	1,267.4	1,263.5	1,279.7	1,648.0	1,635.7	18,951.1
Arlington	231.3	165.8	195.3	269.7	301.2	32.8
TOTAL	73,357.7	65,727.9	66,885.4	67,531.7	79,668.9	54,485.8

LOWER PLATTE RIVER BASIN COALITION

2ND INCREMENT ACCOUNTING

NRD	PEAK SEASON 5-YR ALLOWABLE DEPLETION (AF)	2022 NRD Reported NET Depletion (AF)	NeDNR Reported Depletion (AF)	NRD Prior Years Peak Season CU Use (AF)	2022 NRD Peak Season CU (AF)	NRD Total Peak Season CU Use (AF)	NeDNR Total Peak Season CU (AF)	Total New Peak Season Depletion	Total New Peak Season CU	Remaining 5-YR Allowable Depletion (AF)	Percent of Remaining 5-YR Allowable Depletion
Upper Loup NRD	5,435	41.5	0.0	723.4	236.2	959.6	0.0	41.5	959.6	5,393.5	99.2%
Lower Loup NRD	11,910	-80.8	62.1	2,192.8	155.1	2,347.9	62.1	-18.7	2,410.0	11,928.7	100.2%
Upper Elkhorn NRD	2,965	37.8	0.0	629.7	56.4	686.1	0.0	37.8	686.1	2,927.3	98.7%
Lower Elkhorn NRD	8,346	0.0	-10.0	2,826.6	0.0	2,826.6	-10.0	-10.0	2,816.6	8,356.0	100.1%
Papio-Missouri River NRD	1,826	14.6	0.0	60.8	26.7	87.5	0.0	14.6	87.5	1,811.4	99.2%
Lower Platte South NRD	2,098	3.3	19.2	23.6	3.3	26.6	19.2	22.5	45.8	2,075.5	98.9%
Lower Platte North NRD	3,736	-54.8	0.0	1,918.4	-70.8	1,847.5	0.0	-54.8	1,847.5	3,790.8	101.5%
TOTALS	36,316	(38)	71	8,375	407	8,782	71	33	8853	36,283	100%

CU = Consumptive Use AF = Acre Feet

PMRNRD 2022 IMP Goals Achievement

Met	Examples
Goal 1 Policy	Weed management support, completed LPRB Water Management Plan, GW Management & Plan, LPR Drought Contingency Plan
Goal 2 Inventory	USGS Platte & Elkhorn R. Integrated Monitoring Study, NRD Water Balance Study, data collection (basin-wide database, municipal water use), modeling (LPMT, sub-regional with AEM 3-D data)
Goal 3 Education	World O' Water, urban water conservation activities, cost share soil moisture probes and flow meters, LPRDC press releases, online tools
Goal 4 Cooperate	Lower Platte River Drought Coalition, Basin Accounting, Lower Platte River Drought Consortium Mitigation Plan

JOINTLY IDENTIFIED ACTIONS FOR THE NEXT 2 YEARS

- Update Regional Lower Platte-Missouri Tributaries groundwater model
 - Develop subregional model using AEM data
- Continue to participate in basin-wide and regional planning efforts such as ENWRA, the Lower Platte River Consortium (drought contingency plan), and Lower Platte River Basin Coalition (LPRBC)
 - Basin Plan Technical and Management Committees
 - ENWRA annual meetings

JOINTLY IDENTIFIED ACTIONS FOR THE NEXT 2 YEARS

- Continue effort to develop depletion/consumptive use tracking database as a part of LPRBC
- NRD will complete Irrigated Acres Certification
- Review data from local studies, as available

2022 IMP SUMMARY

Continue to

- cooperate with other NRDs, Coalition, Consortium and other stakeholders,
- develop groundwater models, and
- plan and implement outreach and educational opportunities,

so that local and basin wide water planning efforts are addressed.

QUESTIONS?

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THANK YOU.

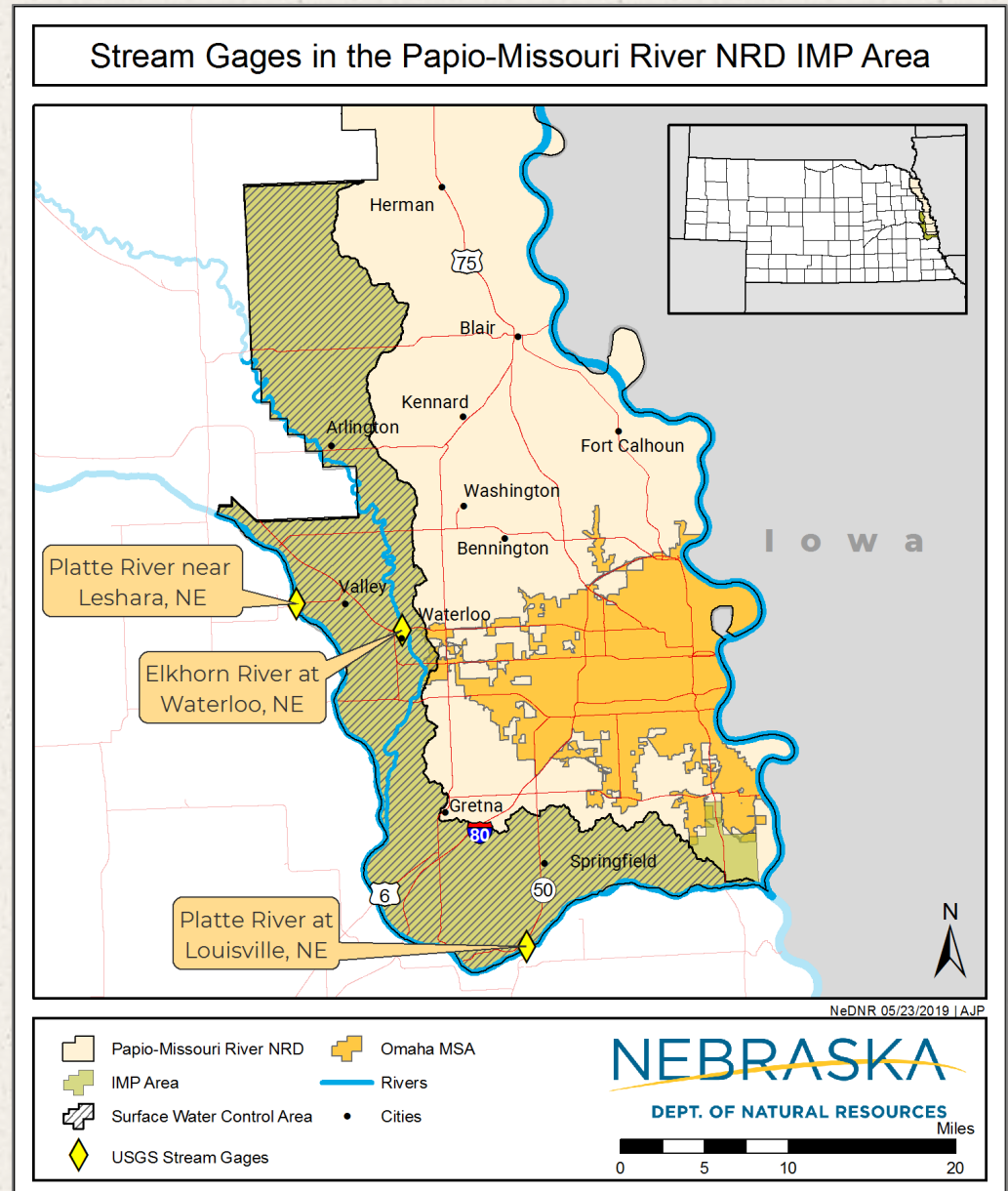
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NEBRASKA
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NeDNR DATA COLLECTION & MONITORING

NeDNR Stream Gaging

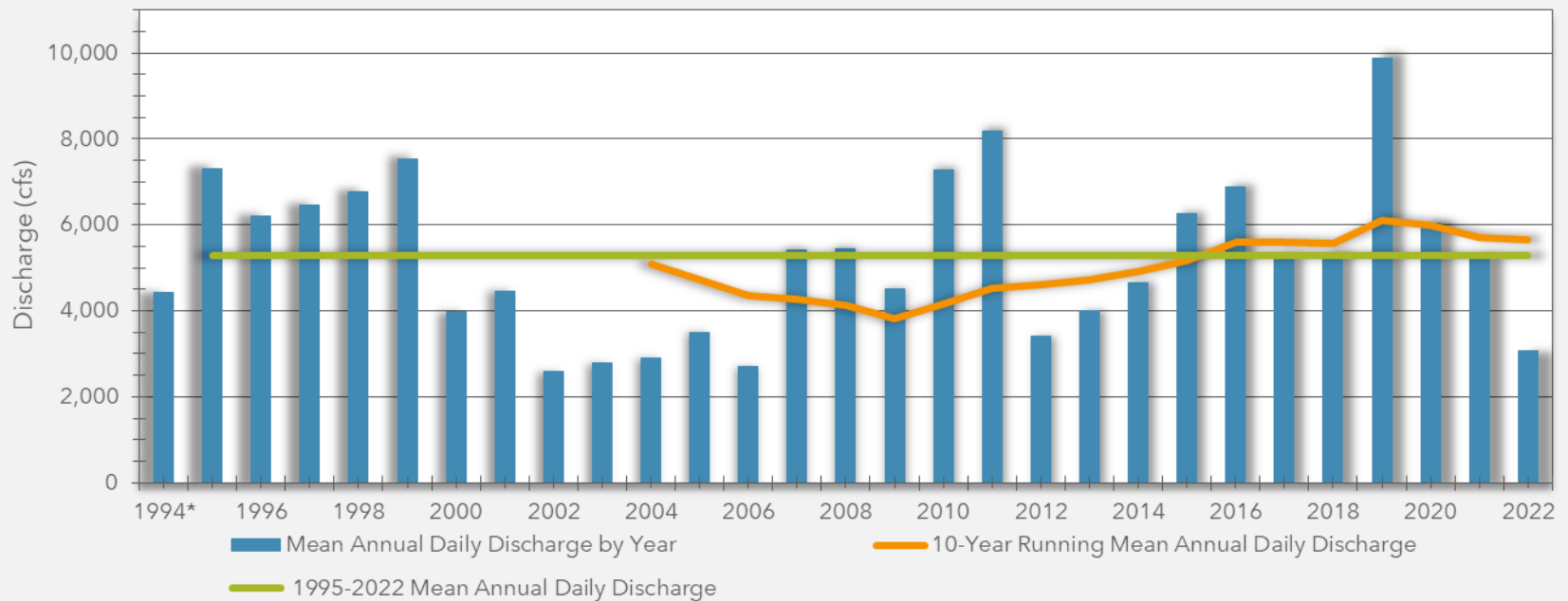
- 3 USGS-owned gages in the IMP area



SURFACE WATER MONITORING

Annual Mean Daily Discharge on the Platte River near Leshara, NE, 1994-2022

USGS Streamgage #06796500

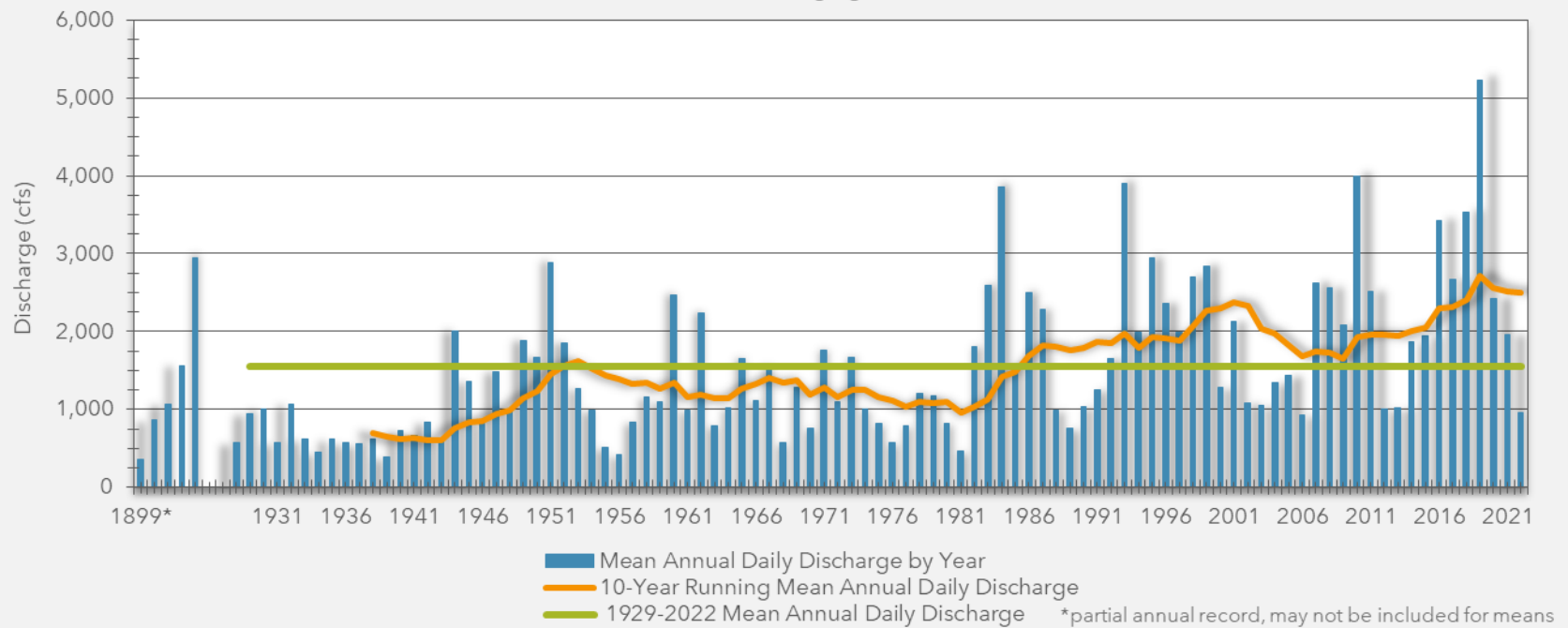


*partial annual record, may not be included for means

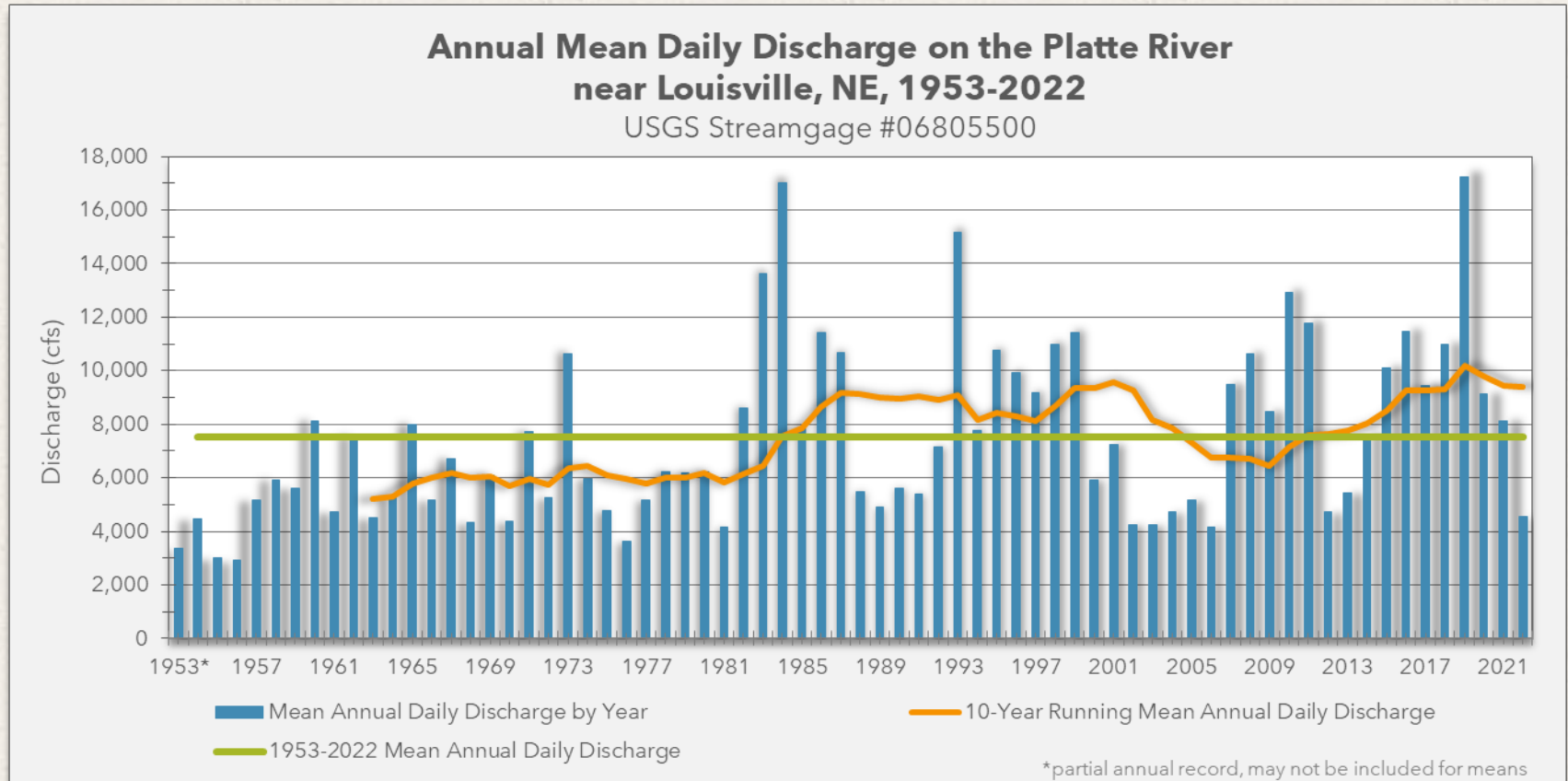
SURFACE WATER MONITORING

Annual Mean Daily Discharge on the Elkhorn River near Waterloo, NE, 1899-1903 and 1928-2022

USGS Streamgage #06800500



SURFACE WATER MONITORING



NeDNR DATA COLLECTION & MONITORING

2022 NeDNR Surface Water Pump Site Inspections IMP Area, Lower Platte River Basin Coalition

NRD	Total Number of Permits	Number of pump site Inspections	Number of pump sites set up for irrigation
Lower Elkhorn	350	219	60
Lower Loup	760	616	369
Lower Platte North	153	131	27
Lower Platte South	134	136	8
Papio-Missouri River	49	26	6
Upper Elkhorn	68	65	5
Upper Loup	20	18	2
Total	1534	1211	477

AMEND OUR IMP?

Lower Platte Basin Water Management Plan

- Current GW and SW controls don't match annual depletion recommendations of Basin Plan
- *Joint recommendation is to wait until after the first increment is completed to revise IMP controls*

Annual Example with Basin Plan Depletions

Entity	Allotted Depletion (AF) (June 2016 to Dec. 2021)	Allotted annual depletion (AF)	Net Irrigation Requirement (ft)	Average stream depletion factor	Percent peak season	Allotted Acres per year
NRD	434.5	79	0.583	0.9	0.3	~500
NeDNR	434.5	79	0.583	1.00	1.0	~135
Both	869	158	--	--		~635

GOAL 1 ACTIONS – THROUGH 2022

GOAL 1 - Develop and implement water use policies and practices to protect existing uses while allowing for future water development.

- Continued Lower Platte Weed Management support
- Lower Platte River Basin Water Management Plan, final Dec. 2017
 - 2nd Increment: 2022-2027
- Groundwater Management Plan Revised and Adopted, March 2018
- Groundwater Management
- Lower Platte River Drought Contingency Plan (Consortium), adopted Dec. 2019

GOAL 2 ACTIONS – THROUGH 2022

GOAL 2 - Develop and maintain a water supply and use inventory based on the best available data and analysis.

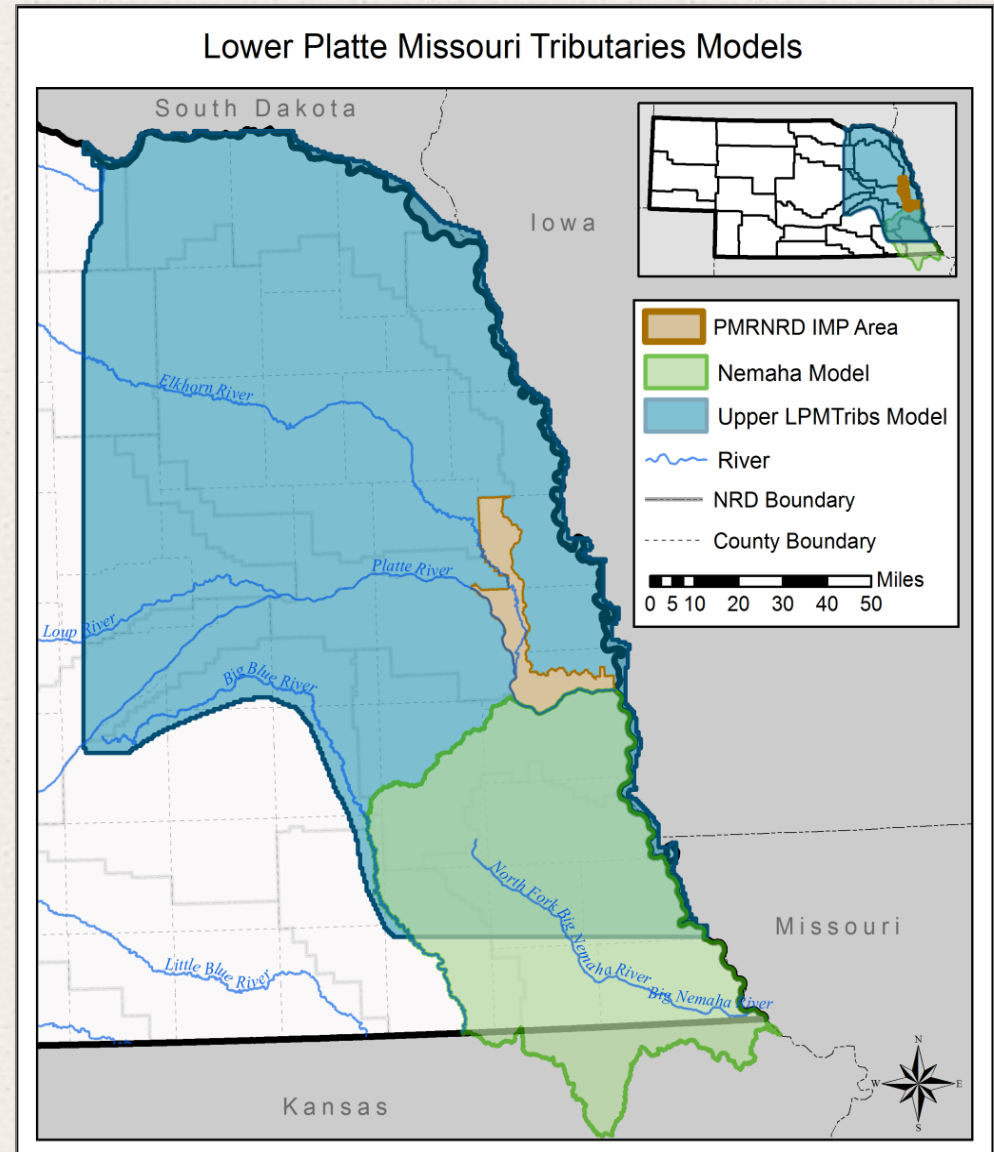
- USGS Platte and Elkhorn River Integrated Monitoring Study
- NRD water balance study
- New basin-wide database is being developed
- Collected municipal water use data
- Enhanced weather and climate data
- NeDNR Lower Platte Missouri Tributaries (LPMT) model update
- Sub-regional modeling with AEM 3-D data



NeDNR Groundwater Model

NeDNR Lower Platte - Missouri Tributaries Groundwater Model

- Completed
 - Initial model development
 - Pilot study in LENRD on AEM data incorporation
- Creating
 - sub-regional model with AEM data



GOAL 3 ACTIONS – THROUGH 2022

GOAL 3 - Develop and implement water use educational programs that encourage conservation and effective water use.

- Joint participation in World O' Water public event
 - <https://www.worldowater.org/activities/>
- Urban water conservation education
- NRD adopted cost-share programs for soil moisture sensors and flow meters
- Lower Platte River Drought Consortium press release and [monitoring dashboard](#)
- NRD implementing WSF grant cost-share program for flow meters on all high-capacity wells in IMP area by 2025.
- Online NeDNR water education tools - hydrological connectivity, water use, supply, and balance



NEDNR PUBLIC OUTREACH

Events

- Husker Harvest Days
- Nebraska State Fair



GOAL 4 ACTIONS – THROUGH 2021

GOAL 4 – Work with upstream NRDs and others to collectively develop a water management plan for the Platte River Basin.

- Lower Platte River Basin Coalition Meetings, Basin Accounting, Reporting
- Participated in Lower Platte River Consortium Drought Mitigation Plan
 - Conduct annual drought monitoring coordination
 - Identify conjunctive management opportunities



P-MRNRD has applied for and received \$1,221,000 in grants for studies in the IMP Area!