

VOLUNTARY INTEGRATED MANAGEMENT PLAN 2018 ANNUAL UPDATE



P-MRNRD PPO Meeting

June 11, 2019

NEBRASKA
DEPT. OF NATURAL RESOURCES



NRD Board and NeDNR Adopted IMP in 2014

1



WATER POLICIES:

Develop and Implement water use policies and practices that contribute to the protection of existing surface and groundwater uses while allowing for future water development.

OBJECTIVES:

- Utilize existing policies and authorities of P-MRNRD and the Nebraska Department of Natural Resources (DNR) to address water quantity issues.
- Minimize invasive vegetation encroachment in the river channels.
- Identify and evaluate potential conjunctive management projects and activities within the V-IMP area.

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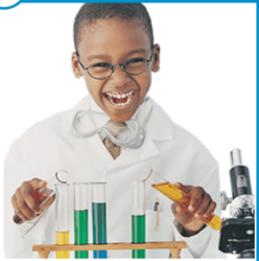
WATER INVENTORY:

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

OBJECTIVES:

- Develop and implement a data gathering and monitoring plan that provides relevant scientific information to support DNR's annual evaluation.
- Monitor and track precipitation, consumption, inflows, and outflows.
- Coordinate with public water suppliers and other water users to understand and project future water demands.

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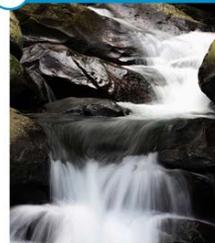
WATER EDUCATION:

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

OBJECTIVES:

- Promote water use education that addresses both rural and urban water conservation efforts.
- Work with other entities on education and conservation programs.
- Explore opportunities to reuse water, where feasible.

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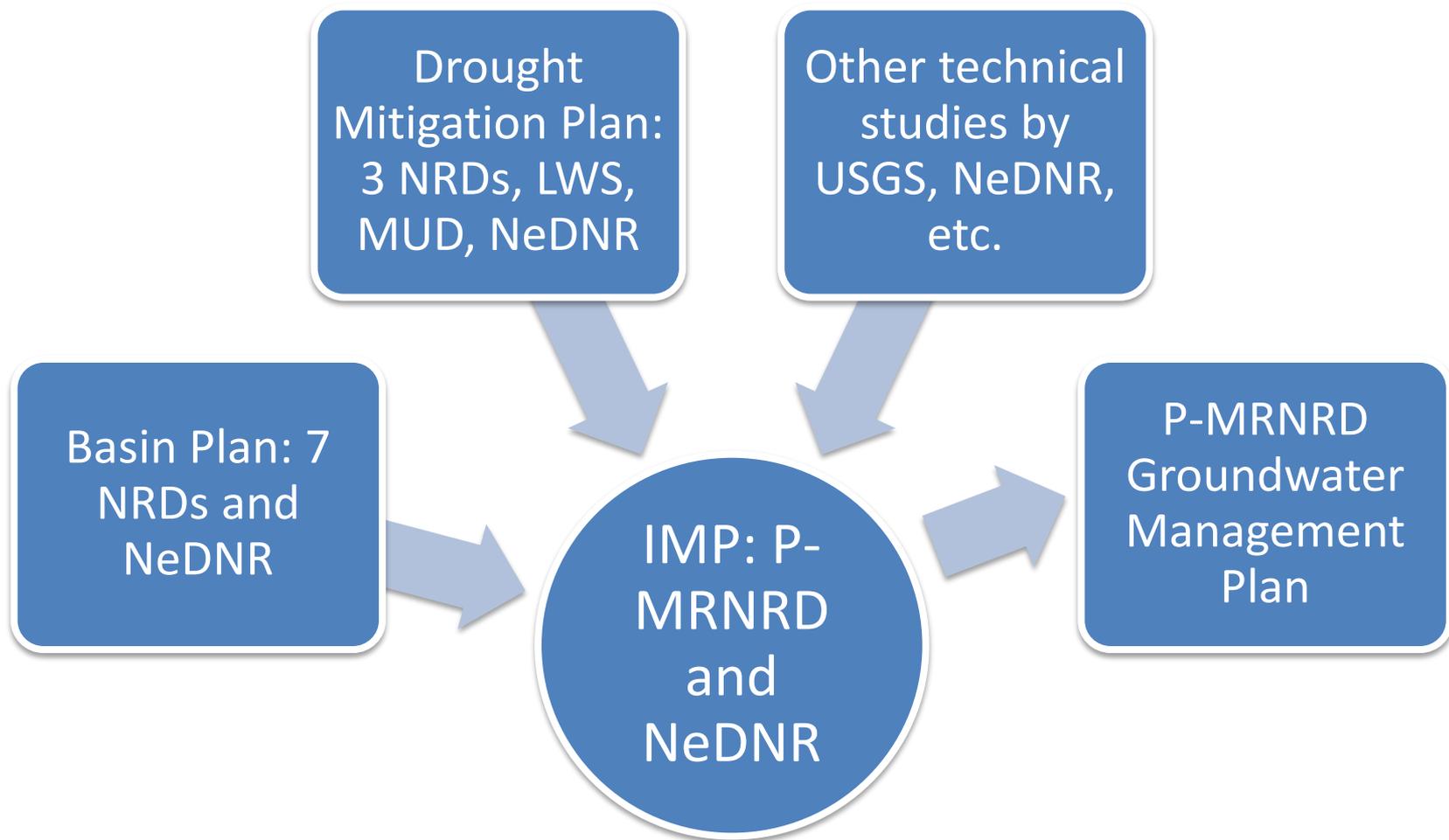
BASIN-WIDE WATER SUSTAINABILITY:

Work with upstream NRDs and other relevant organizations to collectively develop a water management plan for the Platte River Basin that maintains a balance between current and future water supplies and demands.

GOAL 4 OBJECTIVES:

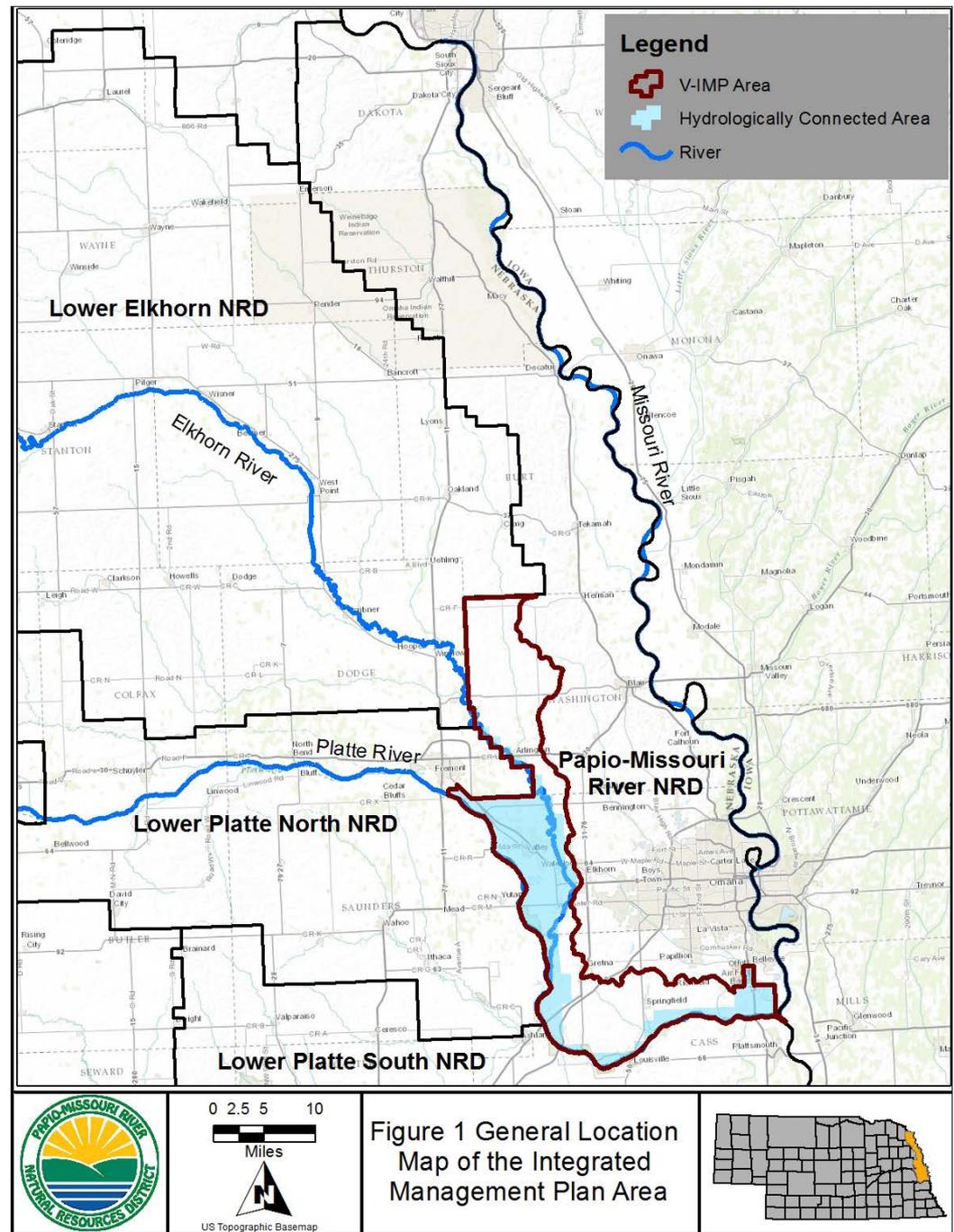
- Actively participate in Lower Platte Basin water management planning activities.
- Identify and evaluate potential conjunctive management projects and activities within the Lower Platte Basin.
- Identify and evaluate additional water resource supplies.
- Coordinate with other entities in the entire Platte River Basin on water management planning and activities.
- Work with the appropriate agencies to identify streamflow necessary to protect and maintain public water supply, fish and wildlife, and public recreation.

How do multiple plans work together?



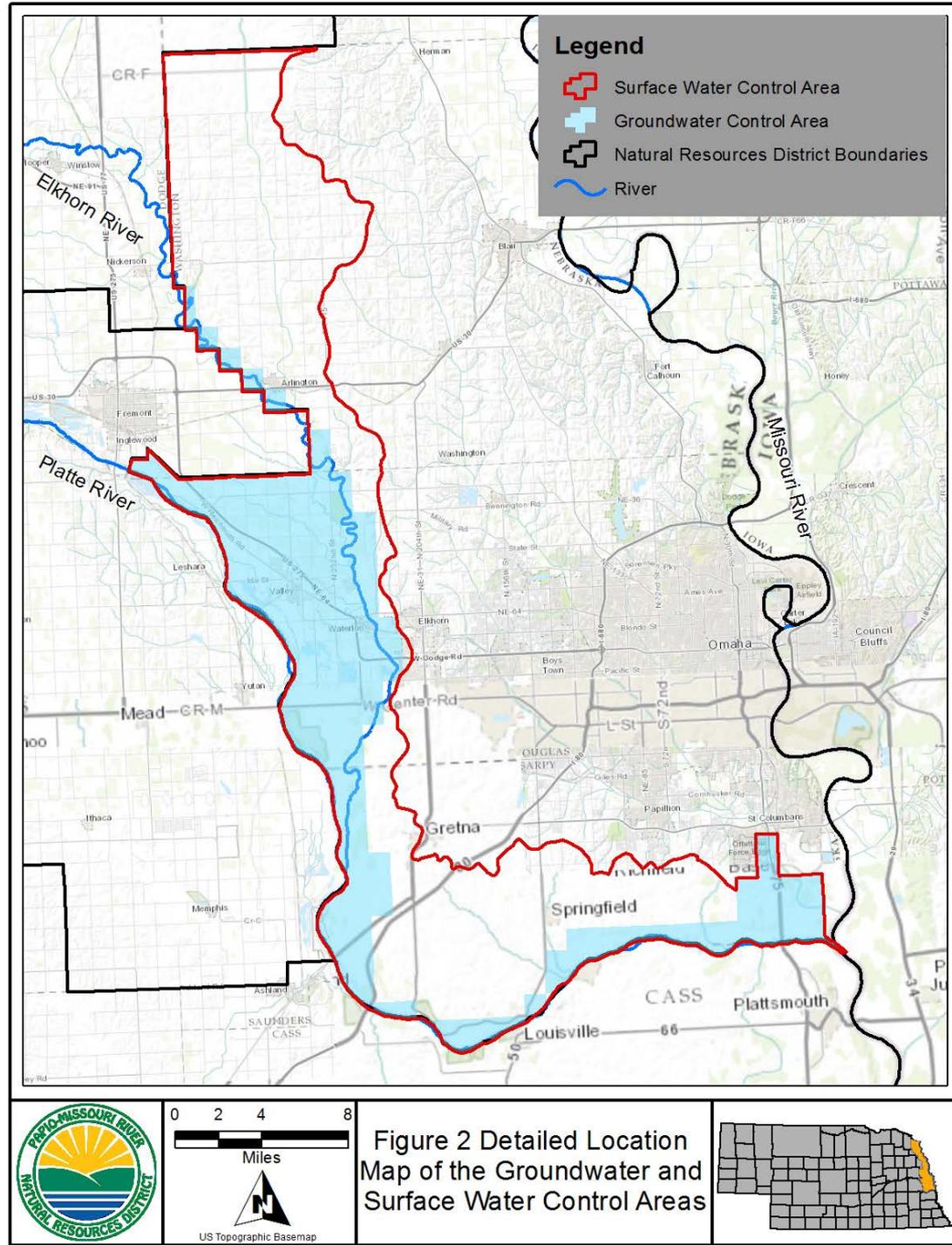
An IMP is a local plan between an NRD and NeDNR to address water quantity in hydrologically connected areas.

Papio-Missouri River NRD Integrated Management Plan Area



Groundwater and Surface Water Controls

- NRD Board established a limit of 2,500 acres on the annual expansion of groundwater irrigation.
- NeDNR established a limit of 1/3 the NRD's amount (834 acres) on the annual expansion of surface water irrigation.



Need to Amend our IMP?

- Lower Platte Basin Water Management Plan
 - Current GW and SW controls don't match annual depletion recommendations of Basin Plan
 - *To be consistent with the Basin Plan the IMP would adopt limits for peak season depletions*

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	0.75	0.75	0.3	~470
NeDNR	434.5	79	0.75	1.00	1.0	~105
Both	869	158	--	--		~575

IMP Requires Data Collection and Monitoring

- NRD Monitoring
 - Expansion of irrigated acres
 - Groundwater level measurements
 - Municipal water use
- NeDNR Monitoring
 - NeDNR stream gage measurements
 - Surface water permitting activities
 - Surface water pumpsite inspections
 - Use of surface water for irrigation

NRD Data Collection and Monitoring

- Expansion of Groundwater Irrigated Acres:

<u>Year</u>	<u>Acres with a Variance in HCA Area*</u>
2009	205
2010	664
2011	70
2012	734
2013	1140
2014	470
2015	95
2016	194
2017	11
2018	37
TOTAL	3620

<u>Year</u>	<u>Acres with a Variance in Basin Planning Area*</u>
> July 1, 2016	0
2017	11
2018	0
TOTAL	11

* Basin Plan Area is HCA area above Louisville (Hwy 50) stream gage

* LB 483 Requirement < 2,500 acres each year

NRD Data Collection and Monitoring

- 2018 Groundwater Level Measurements – [See Maps](#)

NRD Data Collection and Monitoring

- Municipal Water Use

Municipal Well Field	2016 Total Pumped (Ac-ft)	2017 Total Pumped (Ac-ft)	2018 Total Pumped (Ac-ft)	Notes
Papillion	4,326.2	4,661.1	4,482.2	
Lincoln	20,451.2	22,115.1	11,866.5	Includes only wells in P-MRNRD
MUD South	38,030.4	27,217.2	31,104.3	
MUD West	8,976.2	12,225.1	10,741.7	Includes only wells in P-MRNRD
Fremont	4,971.5	4,987.4	5,395.3	Includes only wells in P-MRNRD
Valley	334.4	469.3	506.3	
Springfield	170.8	183.8	202.3	
Gretna	1,052.0	1,267.4	1,263.5	
Arlington	217.4	231.3	165.8	
TOTAL	83,501.6	73,357.7	65,727.9	

NeDNR Data Collection and Monitoring

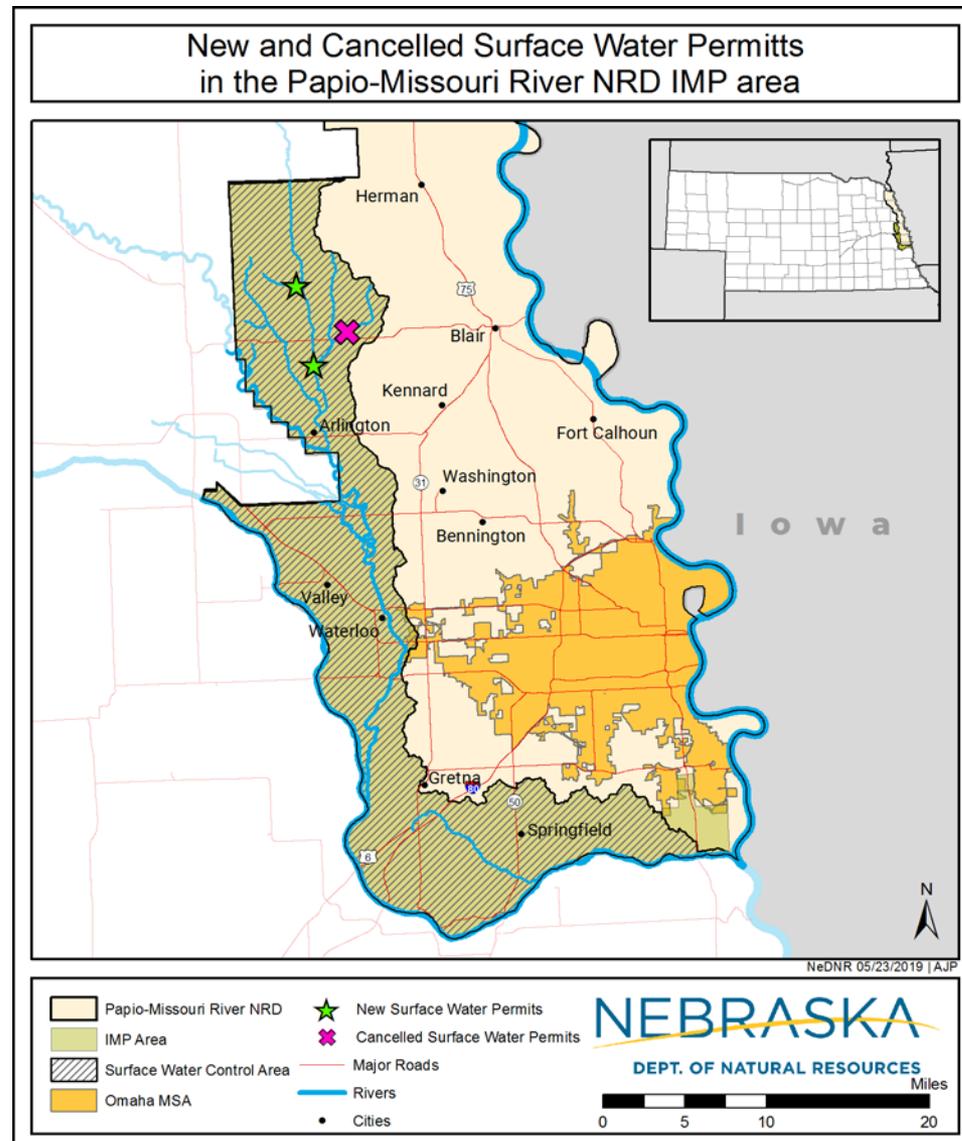
- NeDNR Surface Water Permitting Actions

Surface Water Applications Approved in 2017 and 2018 (IMP area)						
Permit Number	Use	General Location	Source	Date Approved	New Acres Permitted	Acre-Feet
A-19102	Storage	S26-T19-R9E	Buckeye Creek	05/02/2017	NA	58.16
A-19103	Supplemental Irrigation From Storage	S26-T19-R9E	Stork Reservoir	7/1/2017	0	58.16
A-19562	Irrigation	S24-T18-R9E	Bell Creek	9/15/2017	141.6	NA

Surface Water Applications Cancelled in 2017 and 2018 (IMP area)						
Permit Number	Use	General Location	Source	Date Cancelled	Acres Cancelled	Acre-Feet
A-13681	Irrigation	S9-T18-R10E	Trib. to Little Bell Creek	01/27/2017	94.0	NA

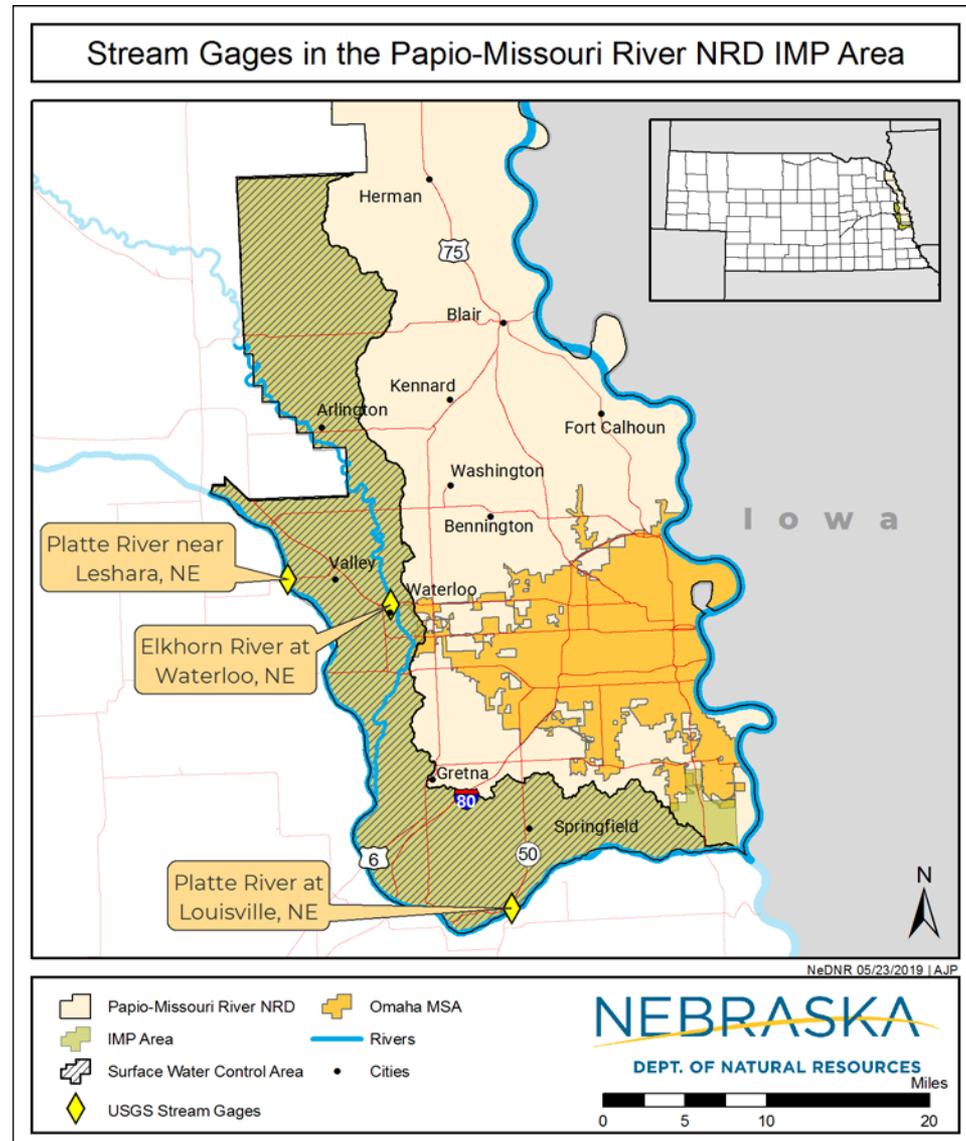
NeDNR Data Collection and Monitoring

- NeDNR Surface Water Permitting Actions

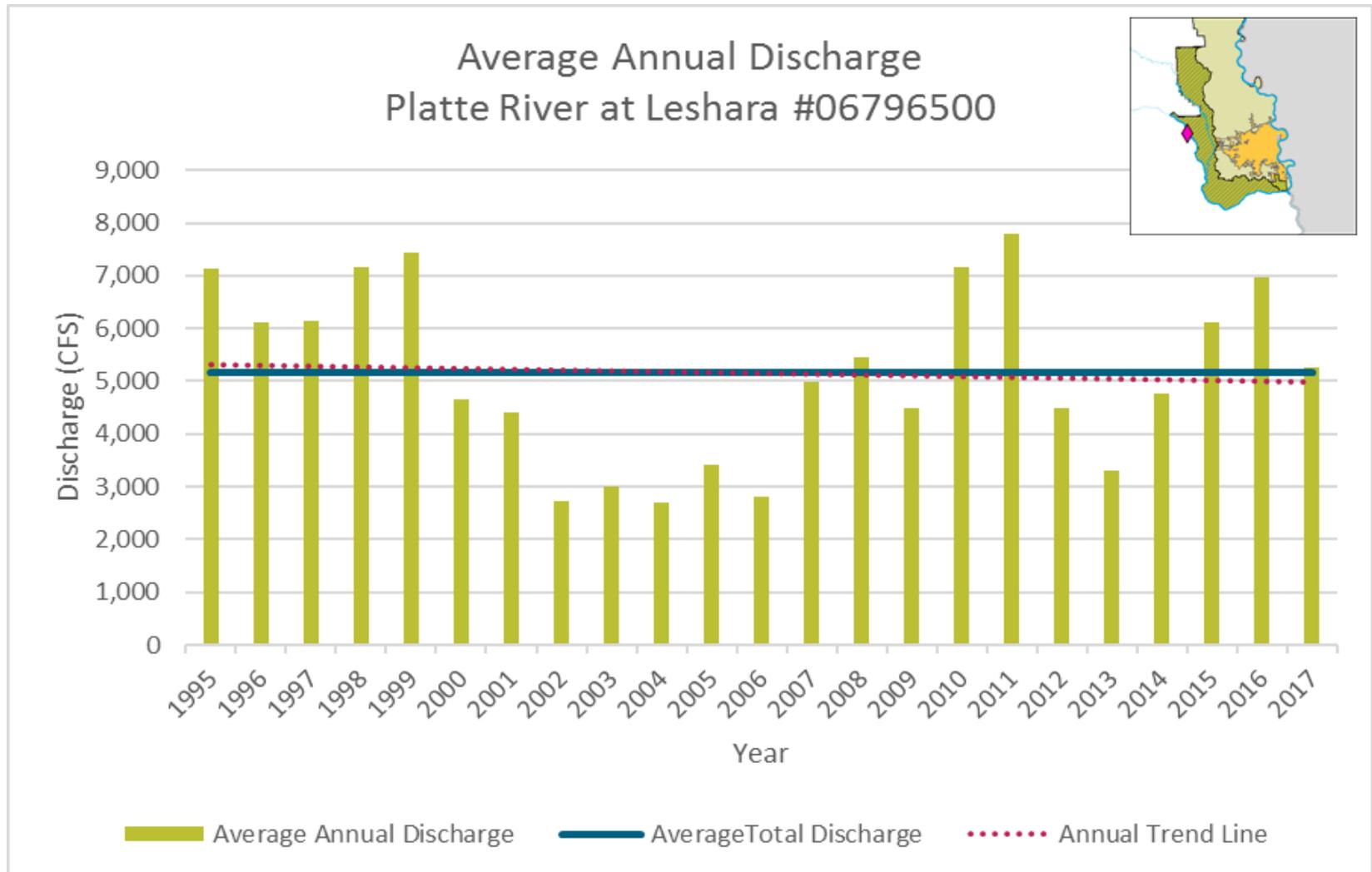


NeDNR Data Collection and Monitoring

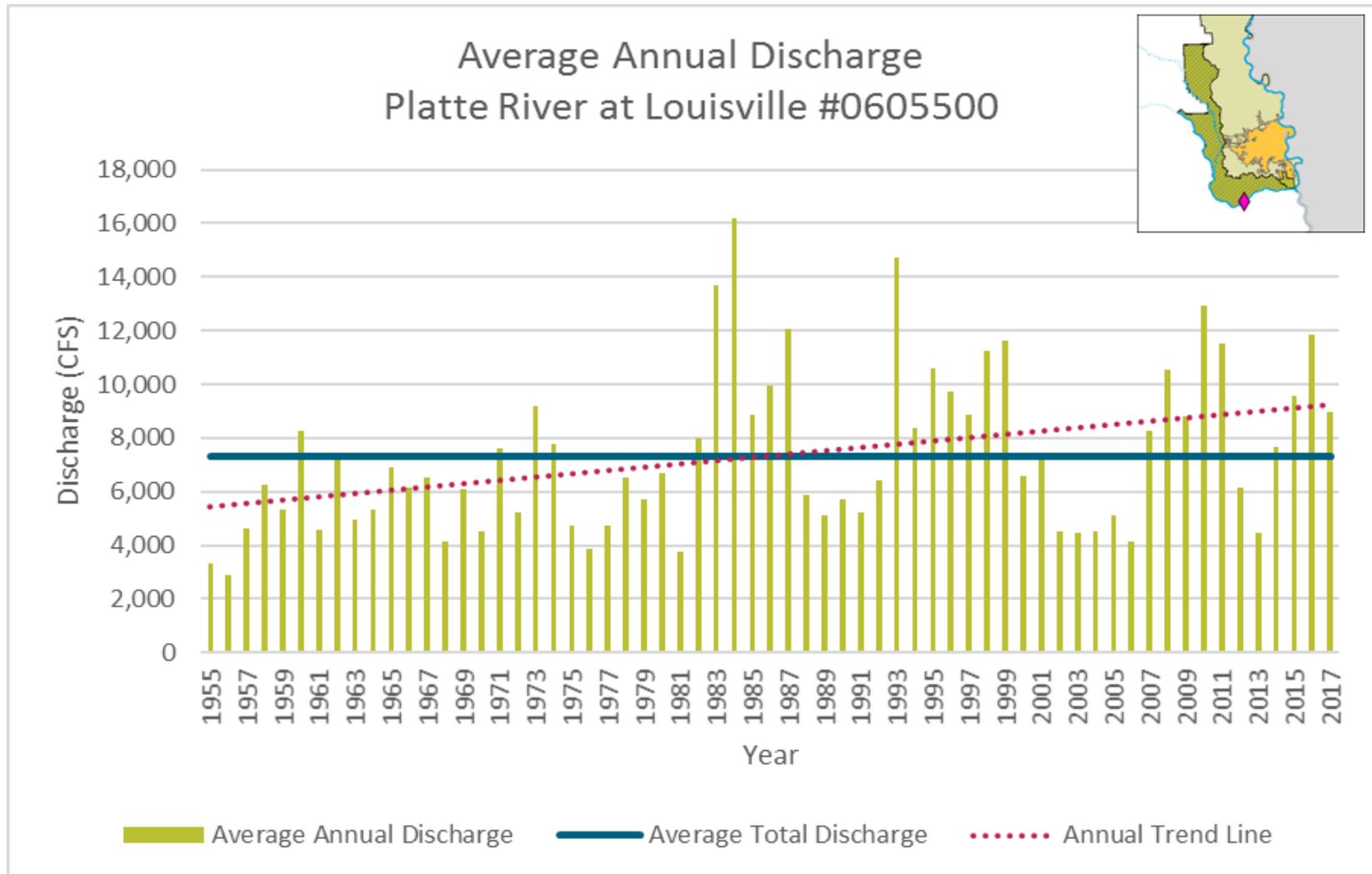
- NeDNR Stream Gaging
 - NeDNR currently does not operate any stream gages in IMP area
 - USGS records were accessed for three stream gages for this annual review



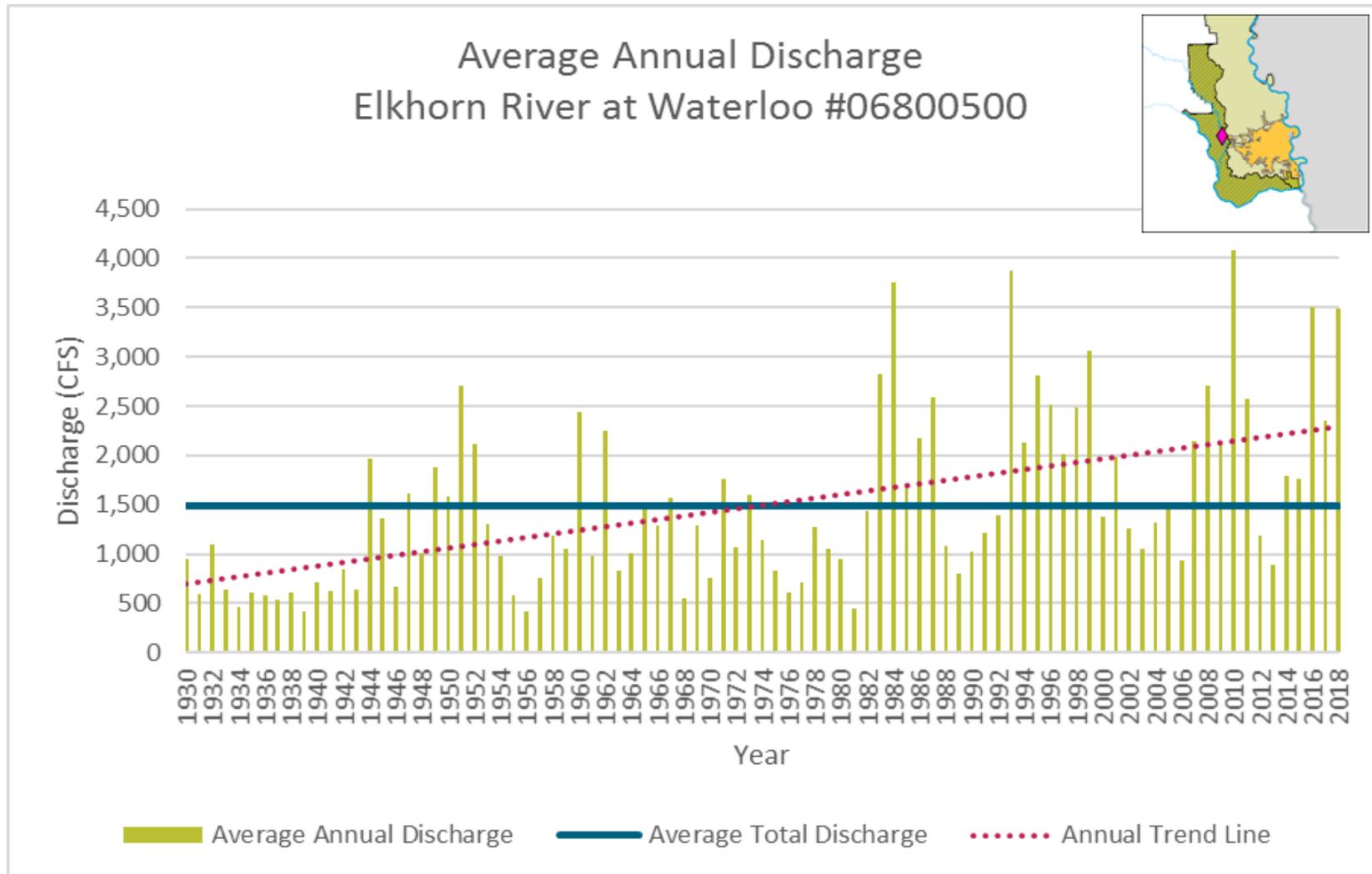
NeDNR SW Monitoring: USGS Stream Gages



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NeDNR SW Monitoring: USGS Stream Gages



NeDNR Data Collection and Monitoring

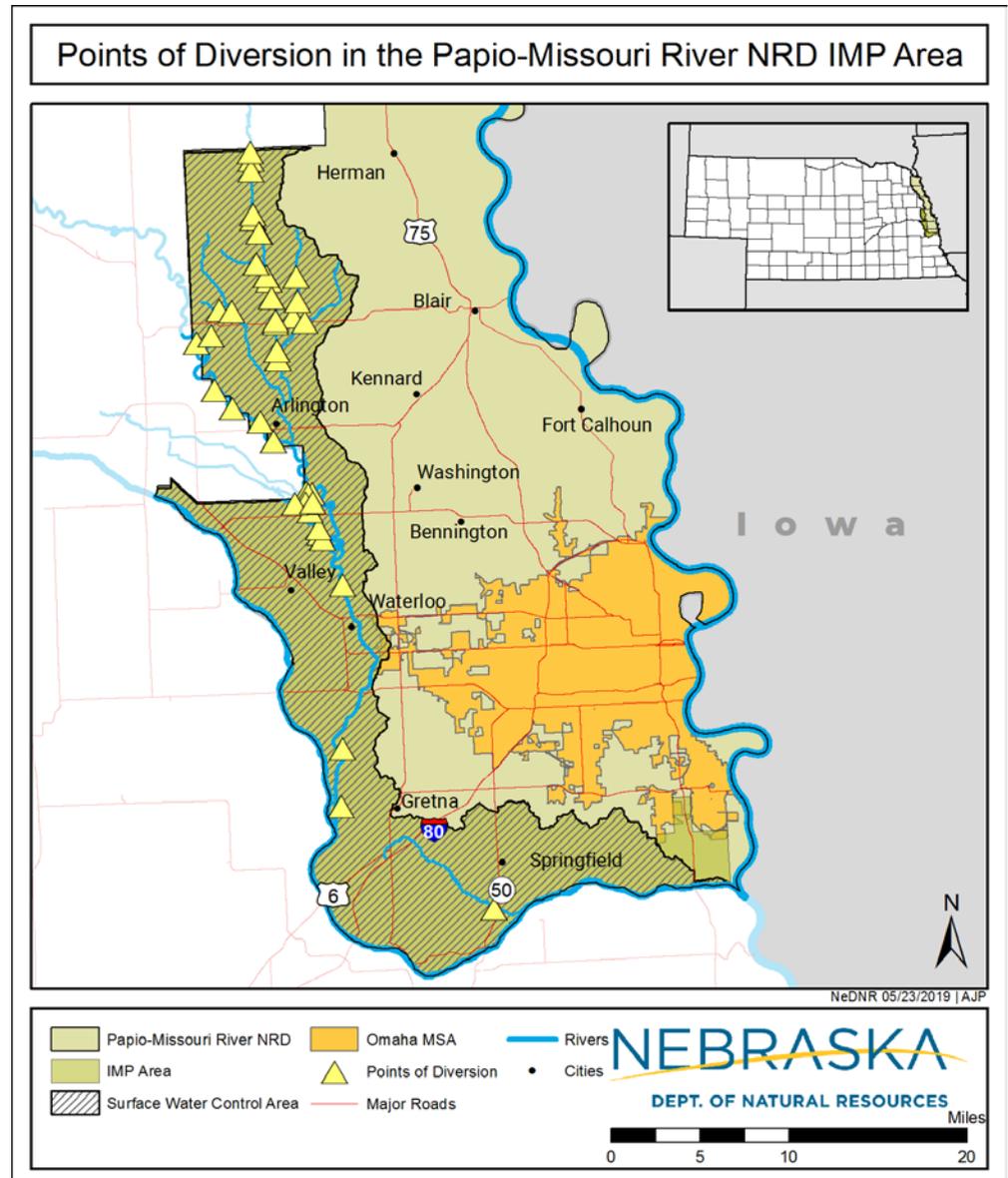
- NeDNR Voluntary Surface Water Use Reporting

Voluntary Surface Water Use Reports for P-MRNRD			
Year	Number of forms sent to irrigators	Number of Responses Received	Response Rate
2015	120	25	20.83%
2016	120	31	25.83%
2017	123	43	34.96%
2018	117	40	34.19%

NeDNR Data Collection and Monitoring

- NeDNR surface water pumpsite inspections

Pumpsite Inspections			
Year	SW Points of Diversion	Number of Pumps Inspected	Associated Permitted Acres
2017	51	44	4,812
2018	51	49	5,213



2018 Goal 1 Actions

- GOAL 1 - Develop and implement water use policies and practices to protect existing uses while allowing for future water development.
 - Groundwater Management Plan Revised and Adopted, March 2018
 - Lower Platte River Basin Water Management Plan, final Dec. 2017
 - 1st Increment: 2016-2021
 - Continued Lower Platte Weed Management support
 - Lower Platte River Drought Mitigation Study (Consortium), sent to USBR for review
 - Includes Drought Mitigation Action alternatives

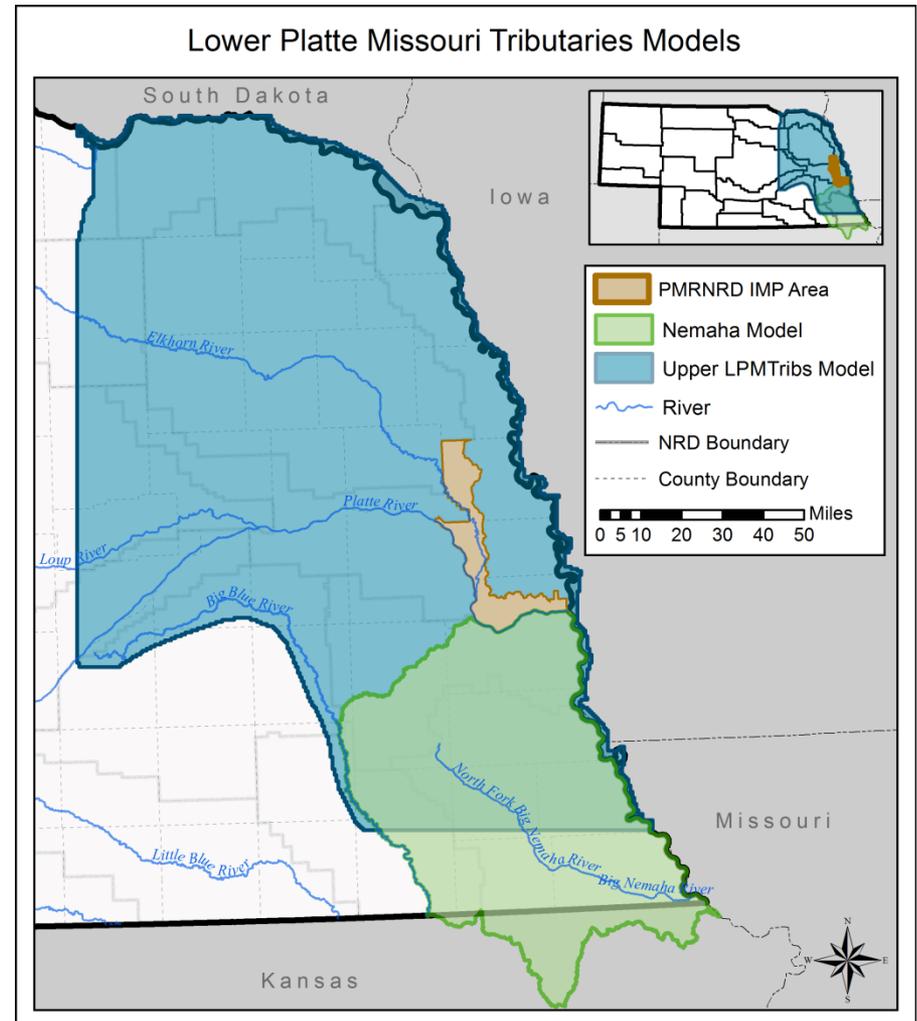
2018 Goal 2 Actions

- 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
 - New basin-wide database is being developed
 - Collected municipal water use data
 - Enhanced weather and climate data
 - NeDNR Lower Platte Missouri Tributaries model



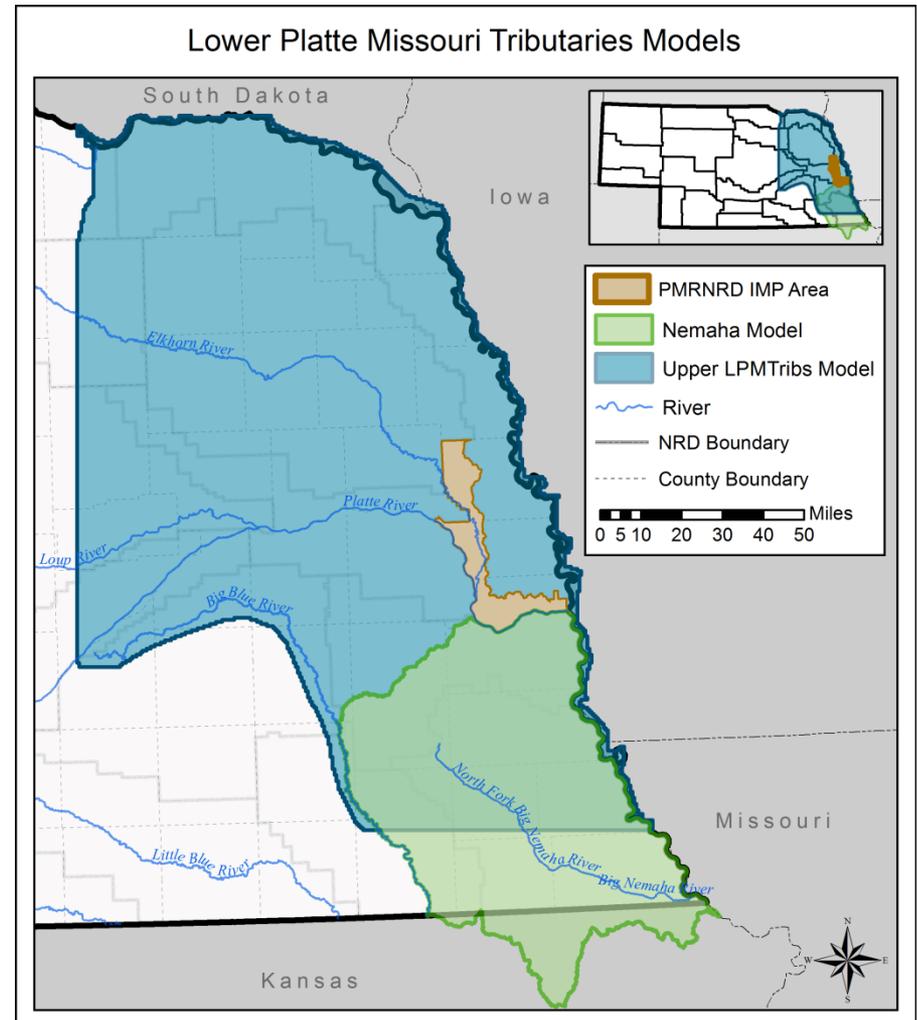
NeDNR Groundwater Model (Goal 2)

- NeDNR Lower Platte Missouri Tributaries Groundwater Model
 - Model development complete
 - Post-processing to evaluate hydrologically connected (HC) areas complete
 - Preliminary HC delineations are undergoing a rigorous QA process
 - Pilot study on AEM data incorporation is underway



NeDNR Groundwater Models (Goal 2)

- Stream depletion factors
 - Model-wide
 - Watershed zones for specific tributaries
- NRD use
 - Access to model and results
 - Evaluate alternative management scenarios
- Nemaha model
 - Will be developed in upcoming years



NRD Public Outreach (Goal 3)

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

- World O' Water public event
- Urban water conservation education
- Adopted cost-share programs for soil moisture sensors and flow meters



NeDNR Public Outreach (Goal 3)

- Events

- Papio-MR NRD's World of Water
- Nebraska State Fair
- Husker Harvest Days
- NARD Fall Conference
- UNL's Women in Agriculture Conference
- American Water Resources Association Specialty Conference in Omaha, March 23-25, 2019



CALL FOR ABSTRACTS

The American Water Resources Association seeks oral and poster presentation abstracts, topical sessions, and workshops on topics pertaining to ***Setting Conditions for the Success of Integrated Water Resources Management (IWRM)***.

Abstract Deadline: November 16, 2018
www.awra.org



2019 Spring
Specialty
Conference

***Setting Conditions
for the
Success of
Integrated Water
Resources
Management***

March 23-27, 2019

Omaha, NE

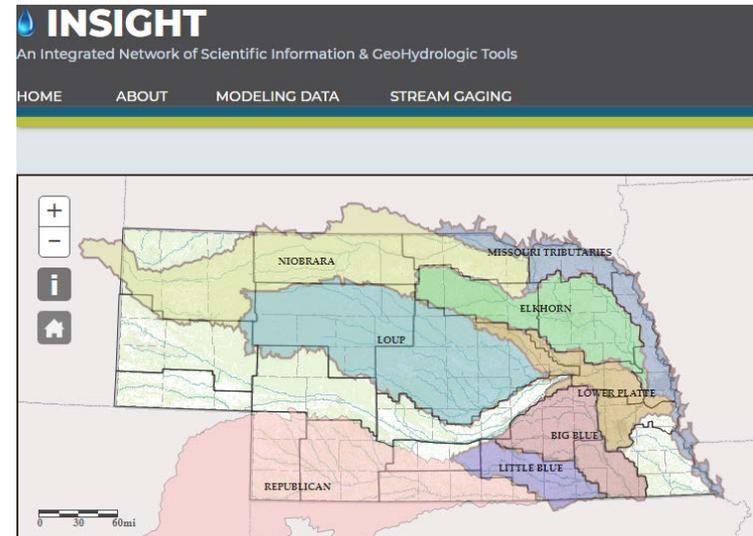
Embassy Suites,
Old Market

NeDNR Public Outreach (Goal 3)

- Internet Tools

- INSIGHT for water use, supply and balance

- Republican River Basin added in 2018
- <https://nednr.nebraska.gov/INSIGHT/>



- Interactive web tools

- Hydrologically connected concepts
- <https://dnr.nebraska.gov/water-planning/education>



NRD and NeDNR Basin Activities (Goal 4)

- 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
 - Participated in Lower Platte River Consortium Drought Mitigation Plan
 - Identify conjunctive management opportunities



PMRNRD has applied for and received \$633,000 in grants for additional studies in IMP Area!

Jointly Identified Actions for Next Two Years

- Review potential IMP amendments to be consistent with Basin Plan
- Continue QA process for Lower Platte-Missouri Tributaries groundwater model hydrologically connected area delineations
- Continue to 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)
- Continue effort to develop depletion/consumptive use tracking database as a part of LPRBC
- Participate at the World O' Water public outreach event to be held on September 7, 2019
- NRD to begin Irrigated Acres Certification with land owners
- Review data from local studies, as available

QUESTIONS?



Voluntary Integrated Management Plan

