

# VOLUNTARY INTEGRATED MANAGEMENT PLAN 2019 ANNUAL UPDATE



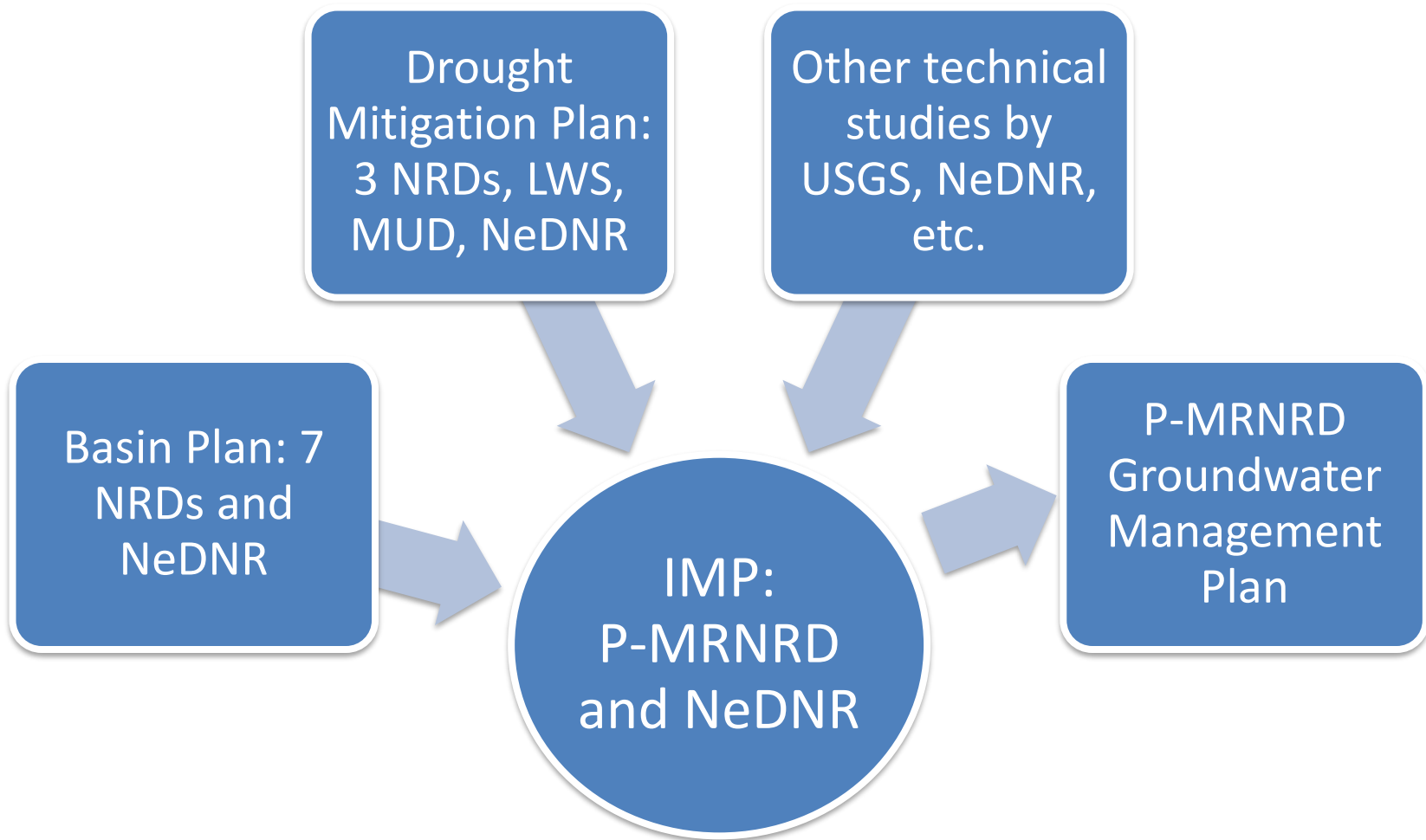
July 7, 2020

P-MRNRD PPO Meeting

**NEBRASKA**  
DEPT. OF NATURAL RESOURCES



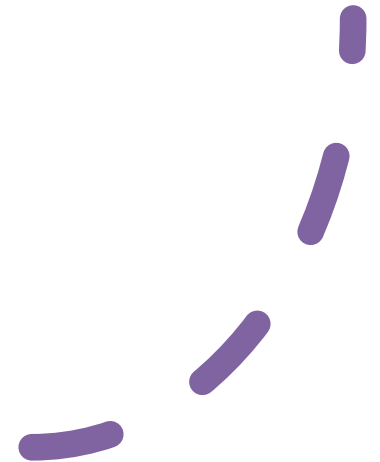
# How do multiple plans work together?



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

**NRD  
Board  
and  
NeDNR  
Adopted  
IMP in  
2014**

- **Four Goals:**
  - Water Use Policies and Practices
  - Water Supply and Use Inventory
  - Water Use Educational Programs
  - Basin-Wide Water Management Plan

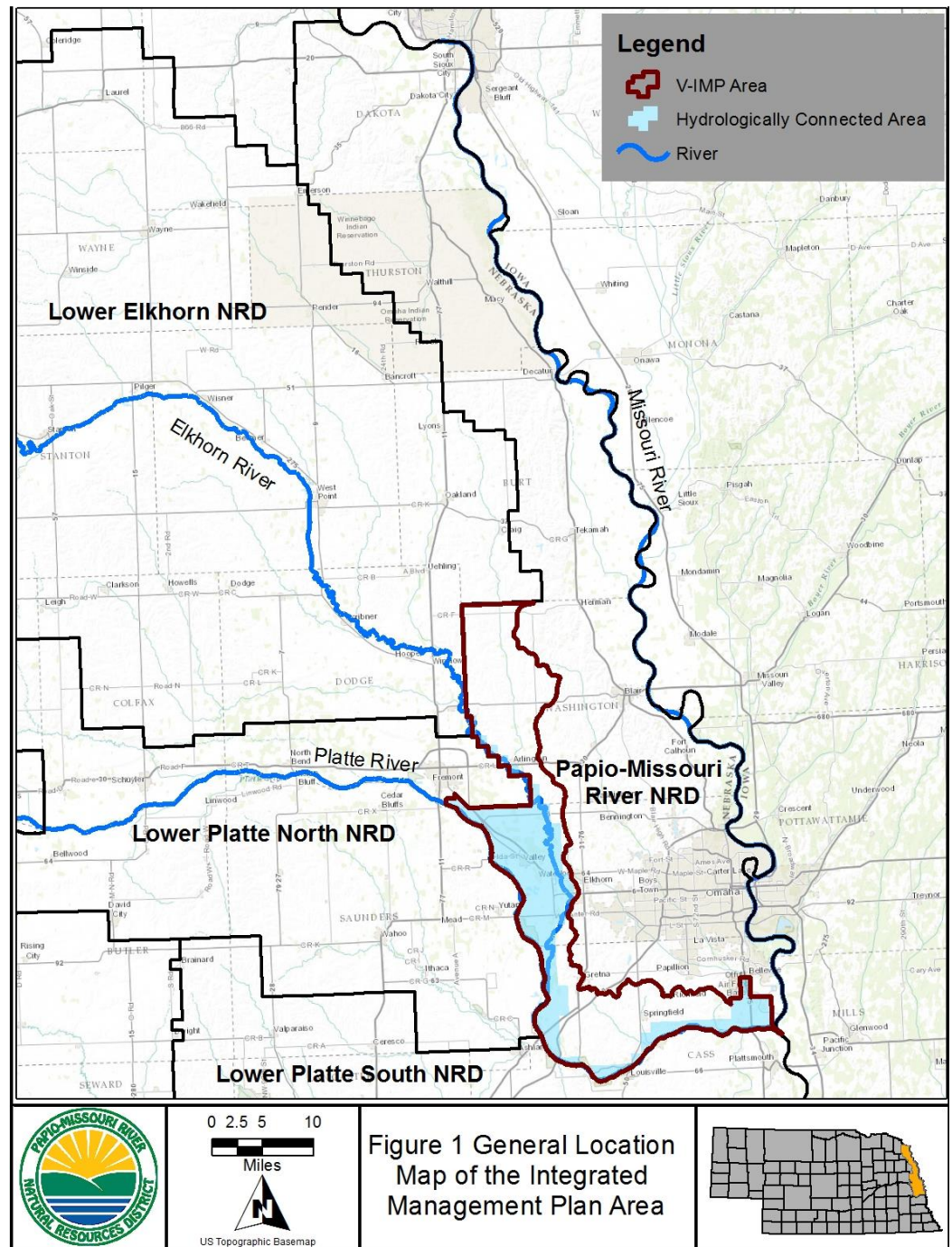


# Why do we conduct annual reviews of the IMP?

- 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

- 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.

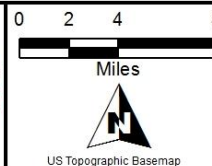
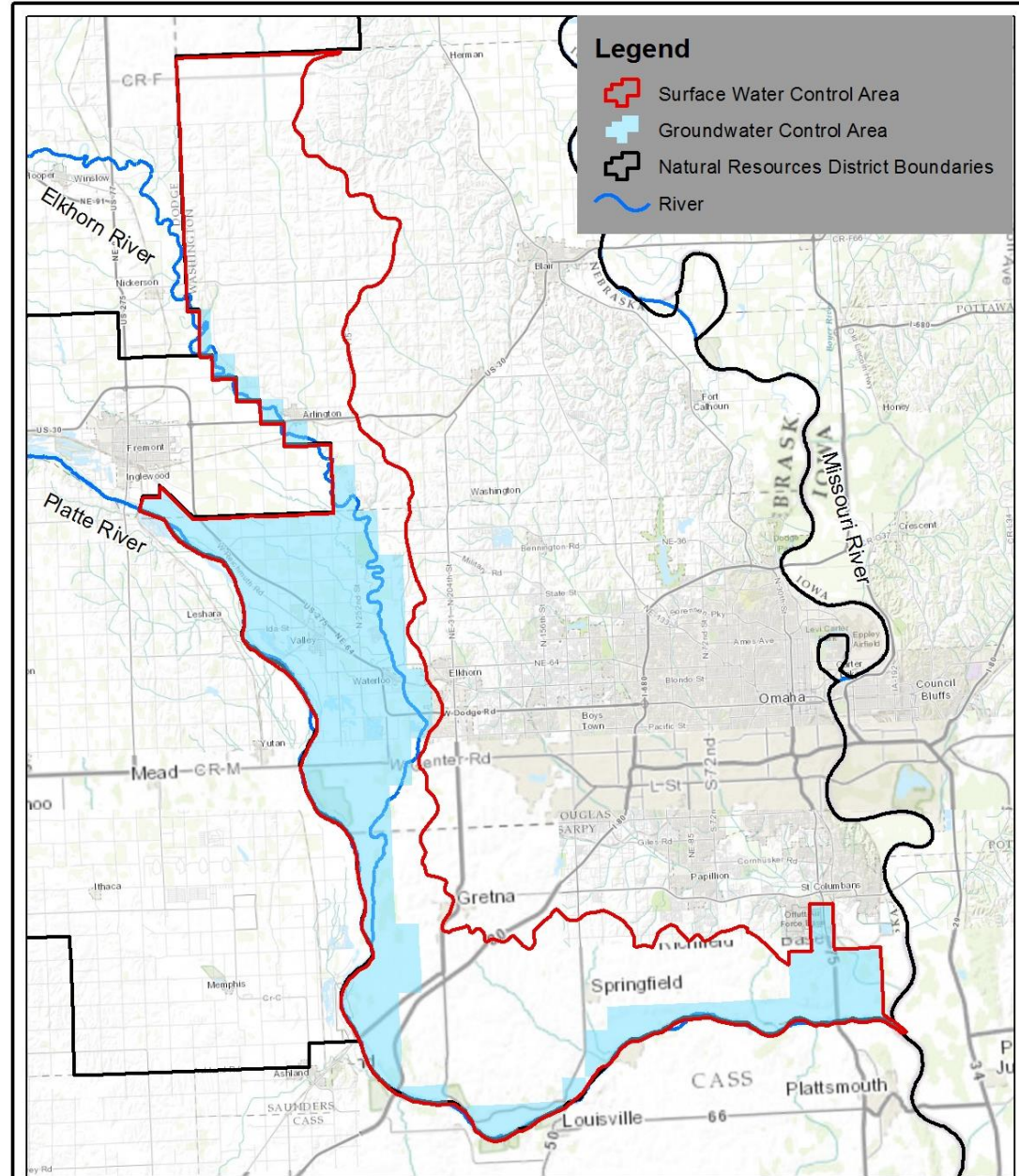
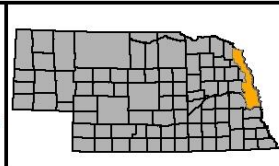


Figure 2 Detailed Location Map of the Groundwater and Surface Water Control Areas

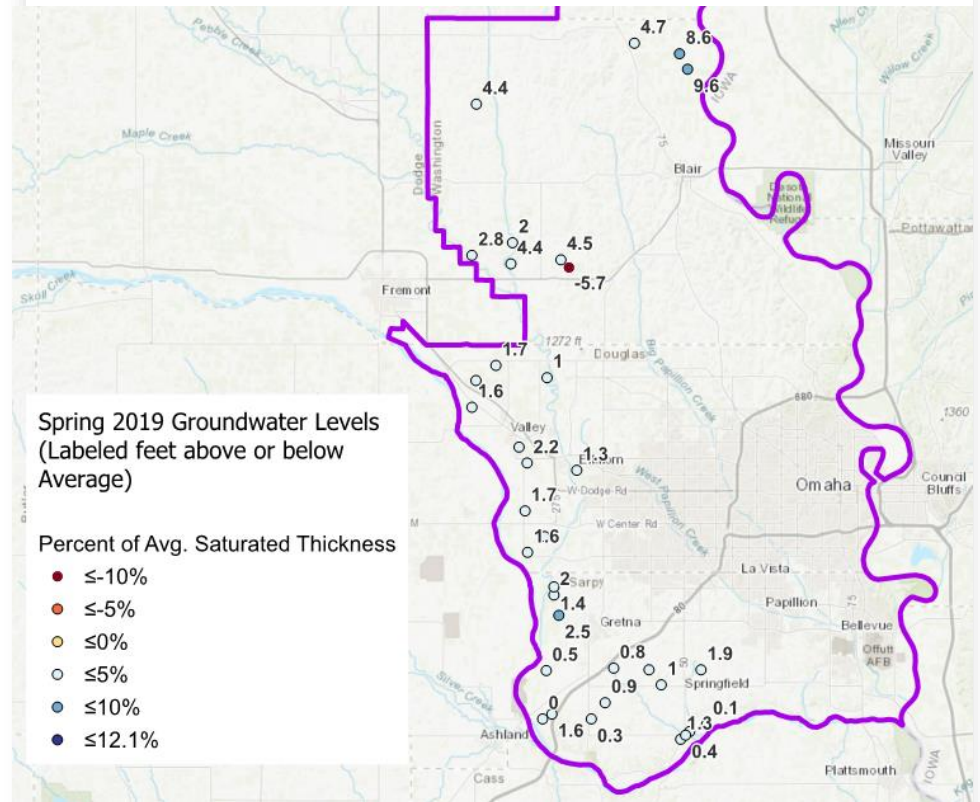


# IMP Requires Data Collection and Monitoring

- 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

## 2019 Groundwater Level Measurements





# NRD Data Collection and Monitoring

- Expansion of Groundwater Irrigated Acres:

Year	Acres with a Variance in HCA Area*
2009	205
2010	664
2011	70
2012	734
2013	1140
2014	470
2015	95
2016	194
2017	11
2018	37**
2019	0
<b>TOTAL</b>	<b>3620</b>

Year	Acres with a Variance in Basin Planning Area*
> July 1, 2016	0
2017	11
2018	0
2019	0
<b>TOTAL</b>	<b>11</b>

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

- LB 483 Requirement < 2,500 acres each year
- \*\* 37 acres is for a sod farm

# 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)	2019 Total Pumped (Ac-ft)	Notes
Papillion	4,326.2	4,661.1	4,482.2	4,655.4	
Lincoln	20,451.2	22,115.1	11,866.5	8,246.5	Includes only wells in P-MRNRD
MUD South	38,030.4	27,217.2	31,104.3	36,201.0	
MUD West	8,976.2	12,225.1	10,741.7	9,861.9	Includes only wells in P-MRNRD
Fremont	4,971.5	4,987.4	5,395.3	5,719.6	Includes only wells in P-MRNRD
Valley	334.4	469.3	506.3	537.3	
Springfield	170.8	183.8	202.3	188.7	
Gretna	1,052.0	1,267.4	1,263.5	1,279.7	
Arlington	217.4	231.3	165.8	195.3	
<b>TOTAL</b>	<b>83,501.6</b>	<b>73,357.7</b>	<b>65,727.9</b>	66,885.4	

# NeDNR Data Collection and Monitoring

- NeDNR Surface Water Permitting Actions

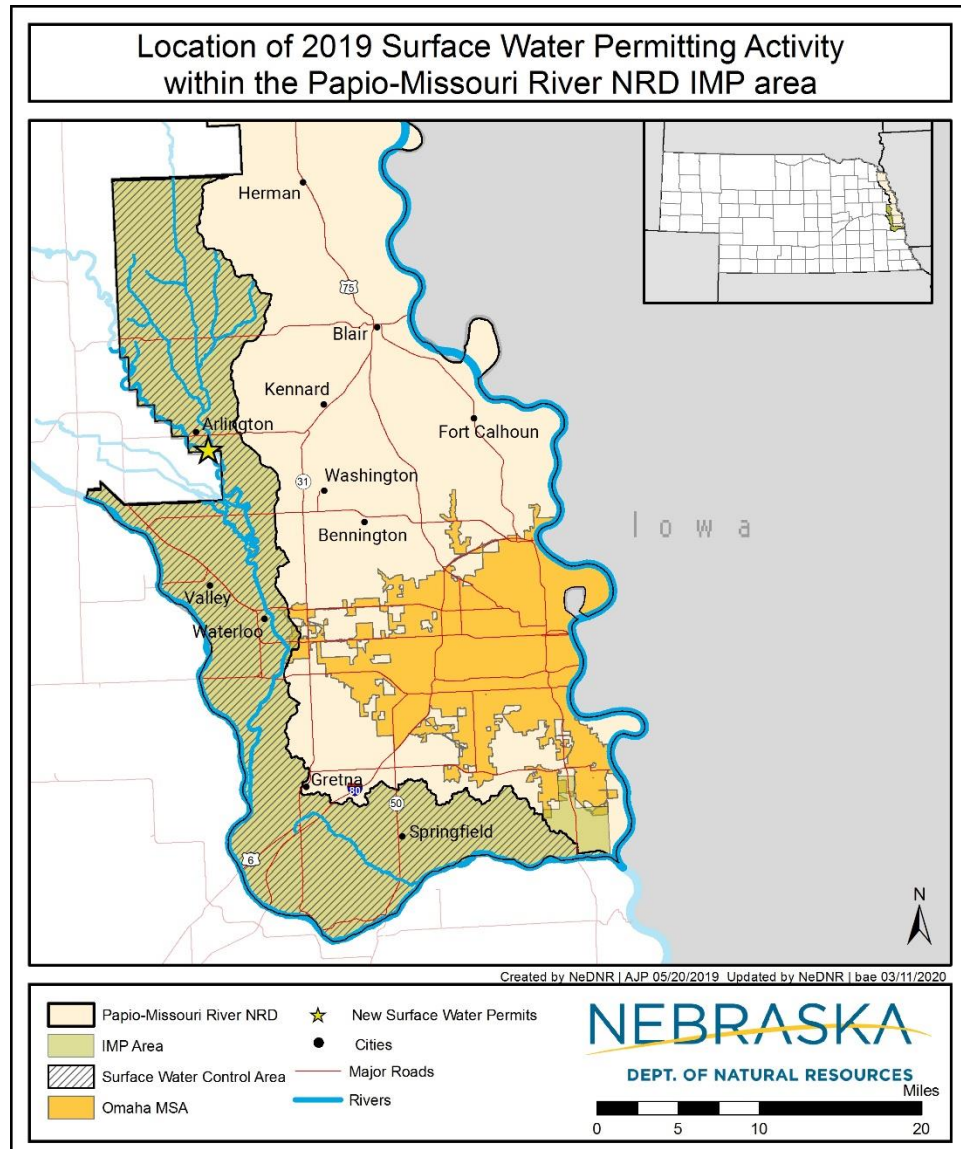
Surface Water Applications Approved 2019 <u>Inside</u> IMP Area						
Permit Number	Use	General Location	Source	Date Approved	New Acres Permitted	Acre-Feet
A-19671 <sup>1</sup>	Road Construction	18-17-10E	Elkhorn River	8/29/2019	NA	10.0

Surface Water Applications Approved 2019 <u>Outside</u> IMP Area							
Permit Number	Use	General Location	Source	Date Approved	Name of Reservoir	New Acres Permitted	Acre-Feet
A-19586	Storage	28-14-12E	Papillion Creek, West, Trib. To	2/14/2019	Regional Detention Basin WP-7	NA	71.2
A-19622	Storage	8-27-7E	Pigeon Creek	7/31/2019	Pigeon-Jones 12A	NA	297.5
A-19670 <sup>1</sup>	Road Construction	7-18-12E	Cameron Ditch	9/4/2019	NA	NA	10.0

<sup>1</sup> A-19671 and A-19670 are both temporary permits to divert water for road construction

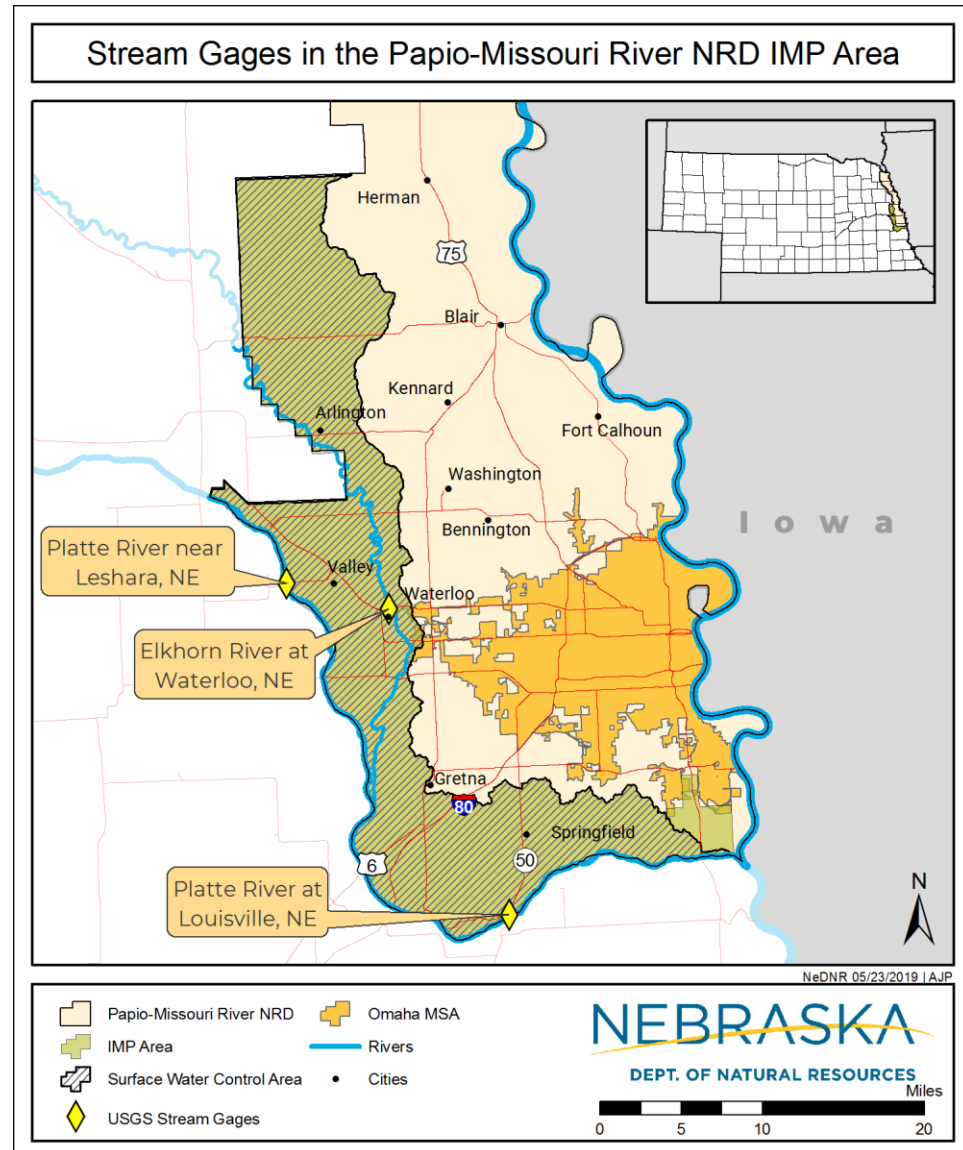
# NeDNR Data Collection and Monitoring

- NeDNR Surface Water Permitting Actions



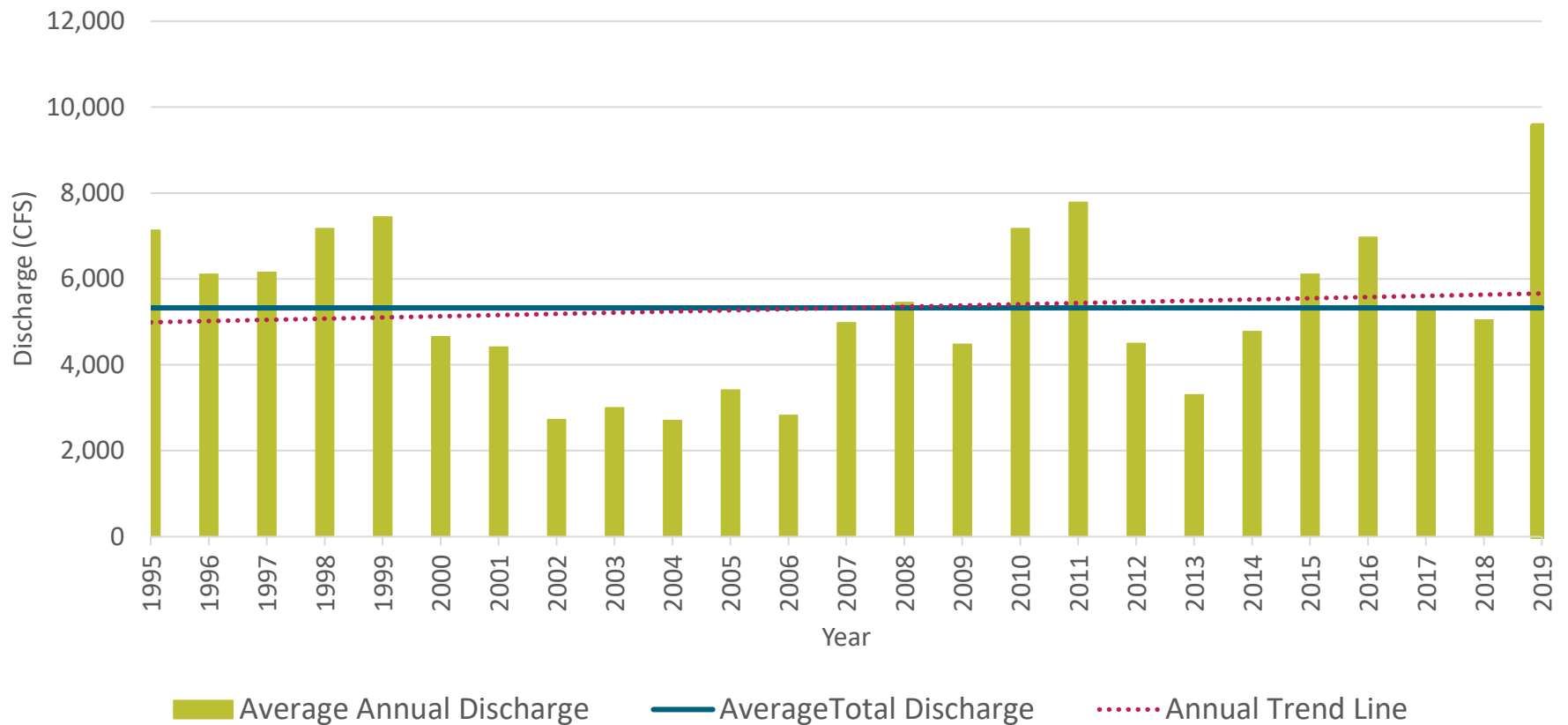
# NeDNR Data Collection and Monitoring

- 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



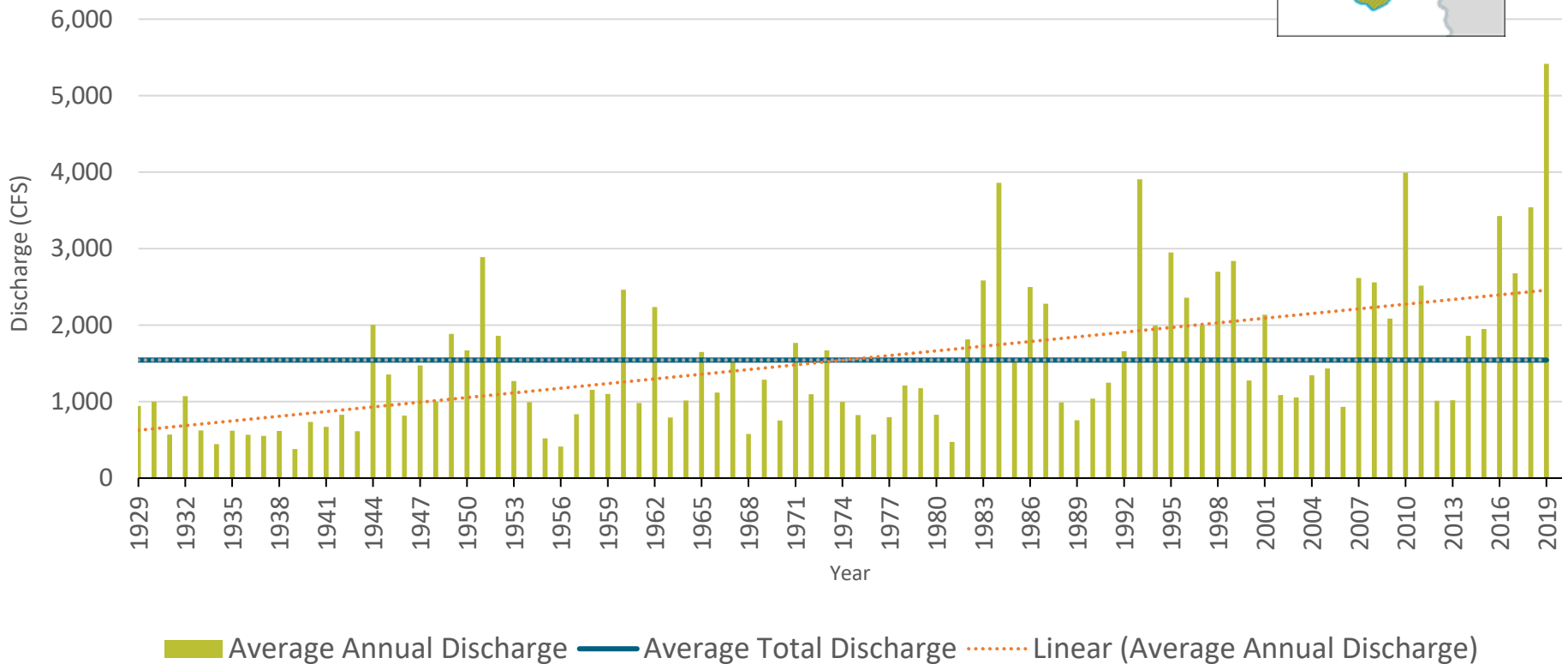
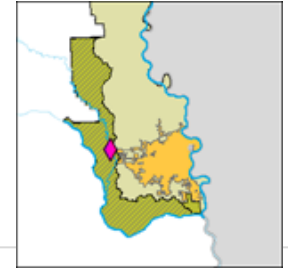
# Surface Water Monitoring: USGS Stream Gages

## Average Annual Discharge Platte River at Leshara #06796500



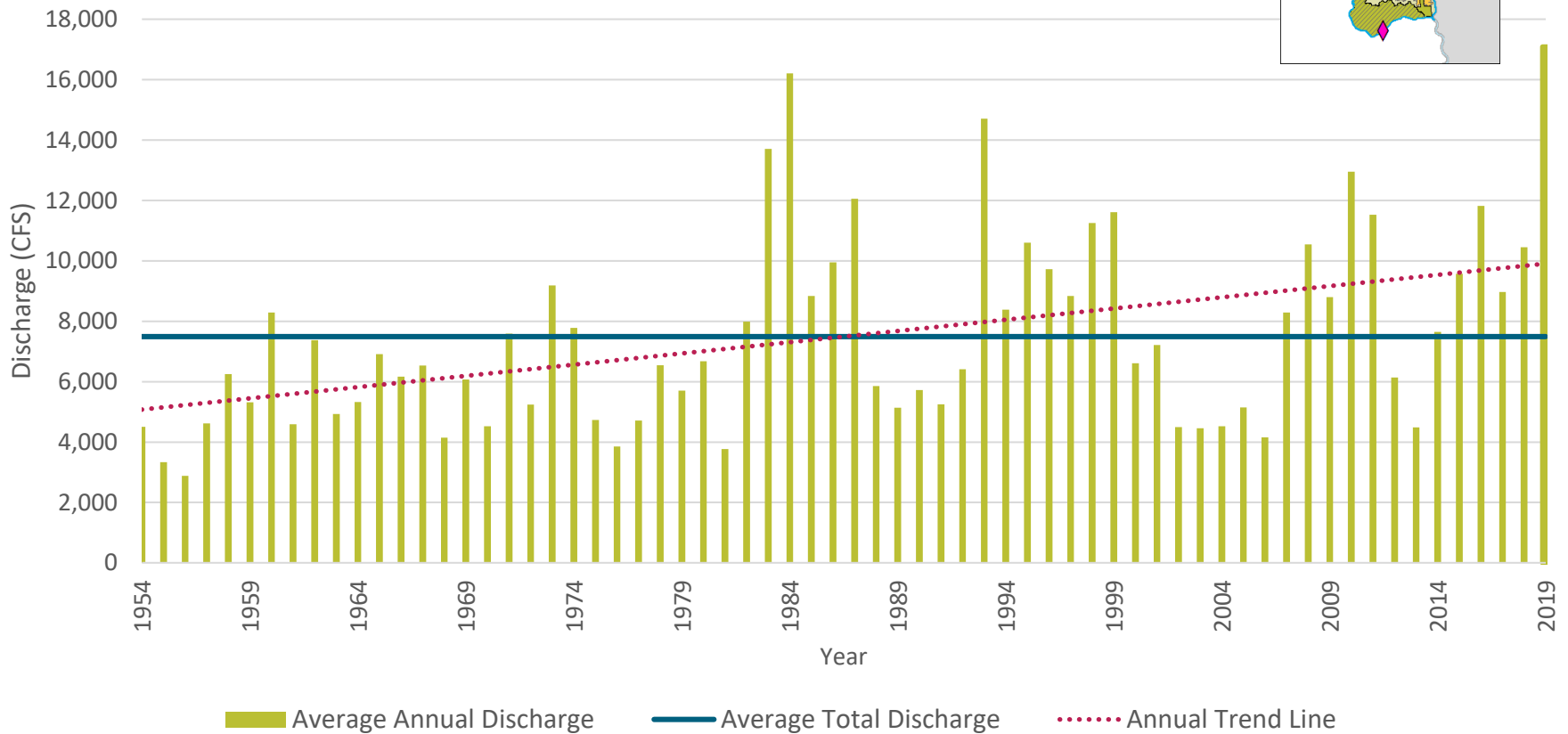
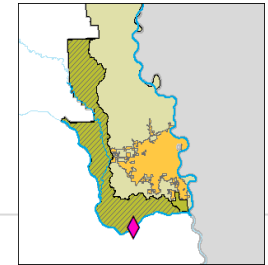
# Surface Water Monitoring: USGS Stream Gages

## Average Annual Discharge Elkhorn River at Waterloo #06800500



# Surface Water Monitoring: USGS Stream Gages

## Average Annual Discharge Platte River at Louisville #0605500





# NeDNR Data Collection and Monitoring

- NeDNR Voluntary Surface Water Use Reporting

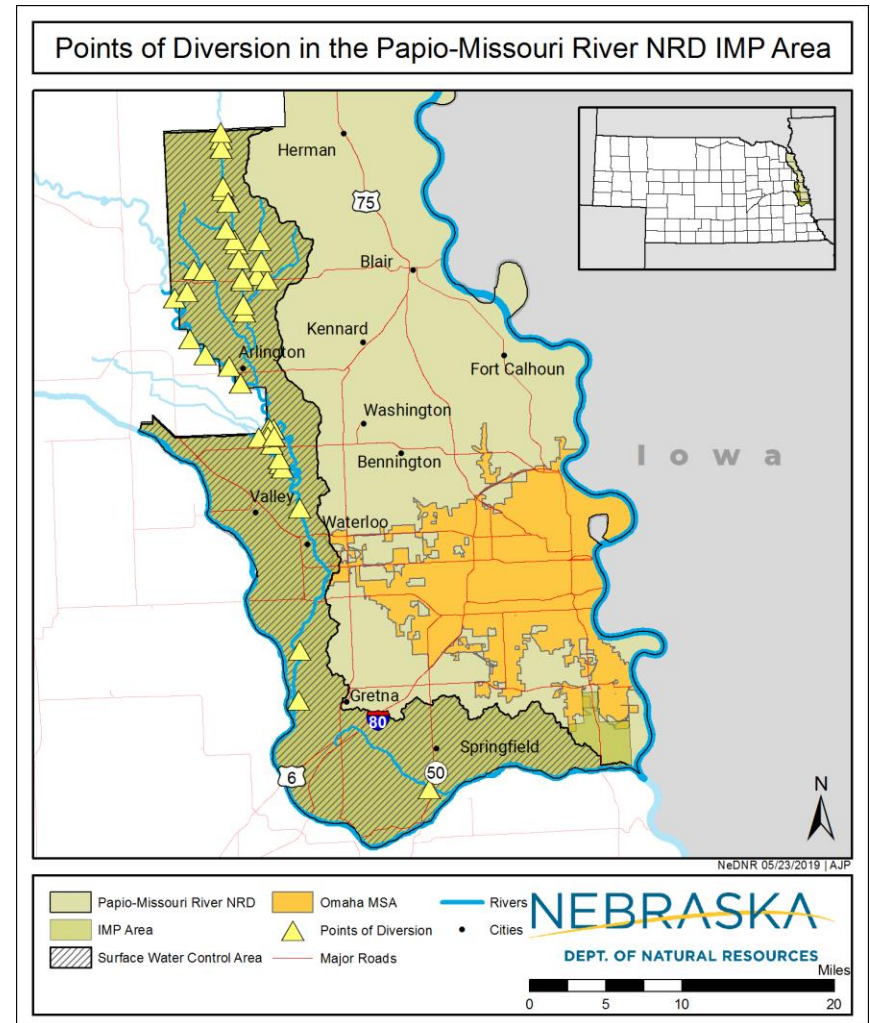
Voluntary Surface Water Use Reports for P-MRNRD			
Year	Number of Forms Sent to Irrigators	Number of Responses Received	Response Rate
2015	120	25	20.83%
2016	120	31	25.83%
2017	123	42	34.96%
2018	117	40	34.19%
2019	117	42	35.90%

# 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
2019	39 <sup>1</sup>	1	95.2

<sup>1</sup>Inside of the IMP area



# 2019 Goal 1 Actions

- 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
    - 1<sup>st</sup> Increment: 2016-2021
  - Groundwater Management Plan Revised and Adopted, March 2018
  - Lower Platte River Drought Contingency Plan (Consortium), adopted Dec. 2019

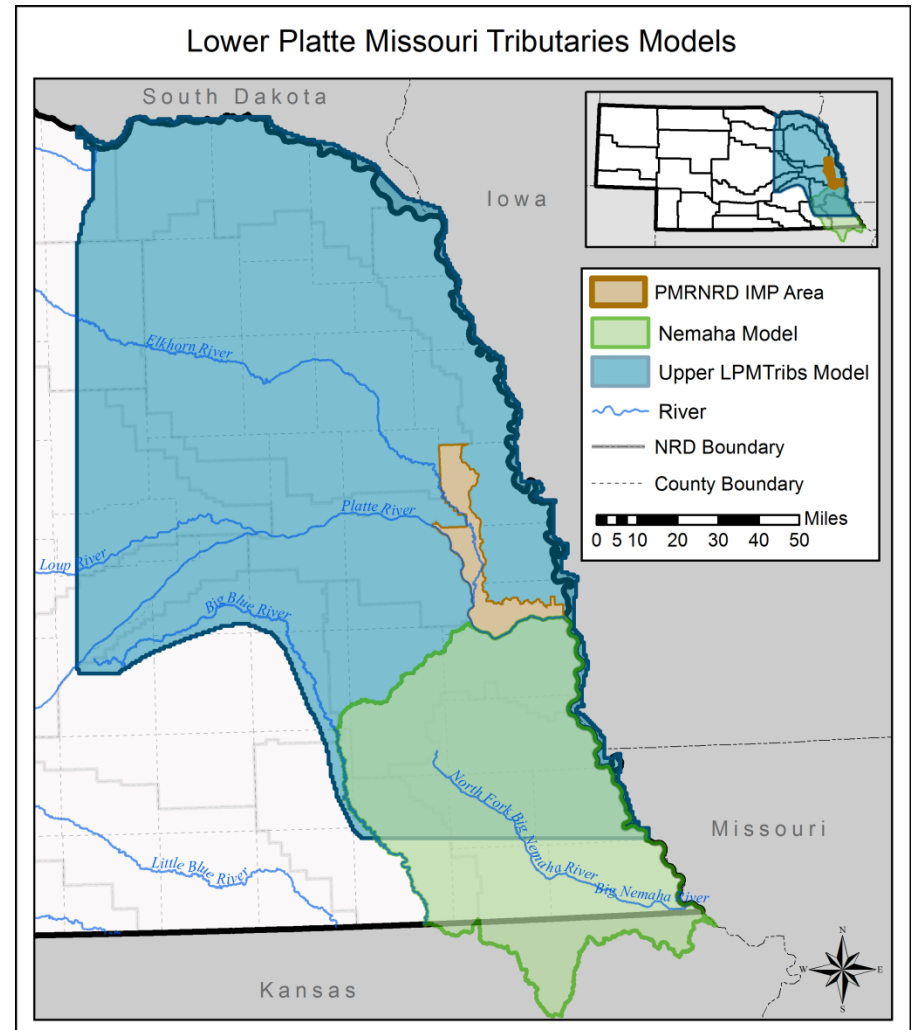
# 2019 Goal 2 Actions

- 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



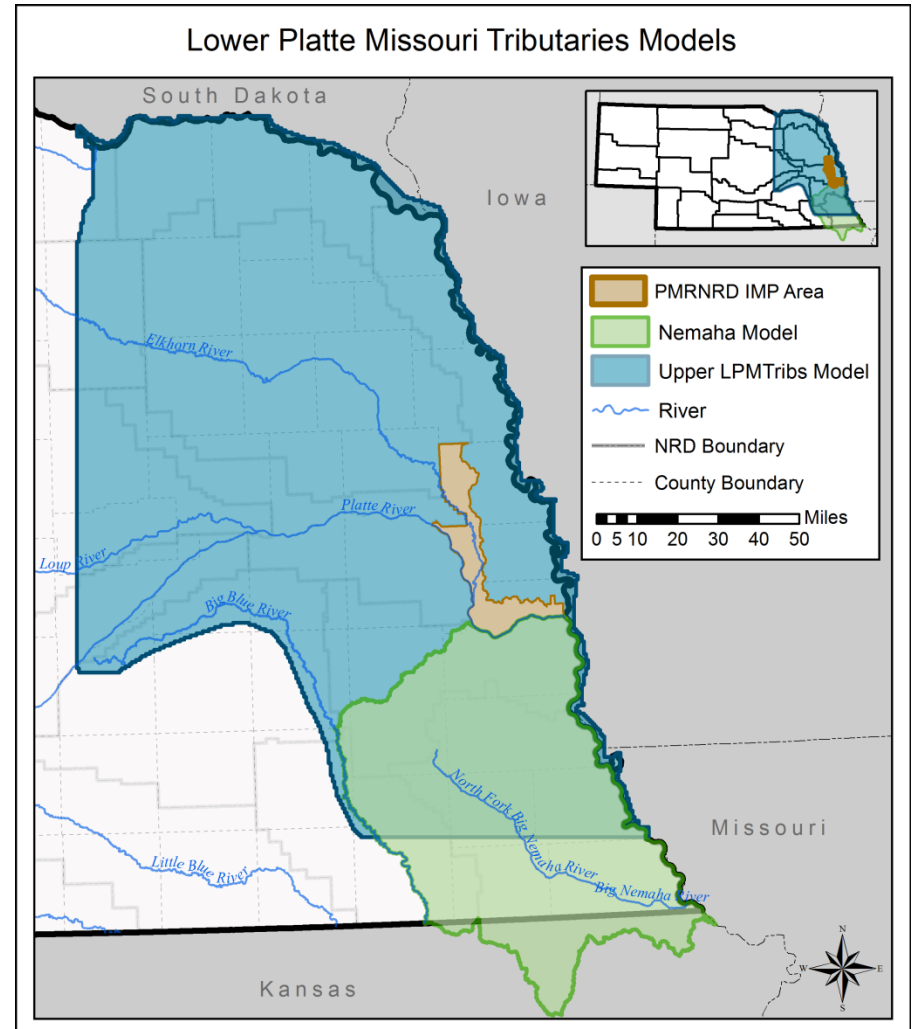
# NeDNR Groundwater Model (Goal 2)

- NeDNR Lower Platte Missouri Tributaries Groundwater Model
  - Initial model development complete
  - Pilot study in LENRD on AEM data incorporation is underway
  - LPN/LPS/PM NRDs preparing to submit a WSF grant application for the creation of model data from AEM data



# NeDNR Groundwater Models (Goal 2)

- Stream depletion factors
  - Model-wide
  - Watershed zones for specific tributaries
- NRD use
  - Access to model and results
  - Evaluate potential model updates using AEM data
- 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
  - P-MRNRD's World O! Water
  - Nebraska State Fair
  - Husker Harvest Days
  - NARD Fall Conference
  - UNL's Women in Agriculture Conference
  - American Water Resources Association Specialty Conference



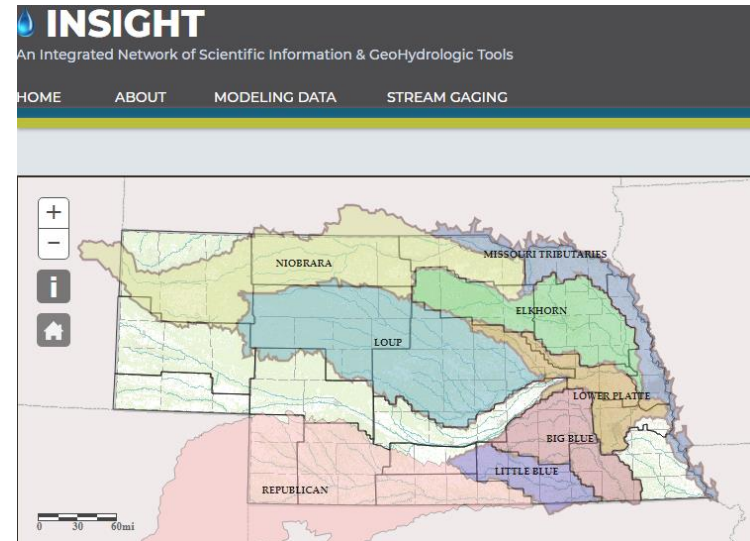


# NeDNR Public Outreach (Goal 3)

- Internet Tools

- INSIGHT for water use, supply and balance

- Upper Platte River Basin added in 2019
- <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, Reporting
  - Participated in Lower Platte River Consortium Drought Mitigation Plan
    - Conduct annual drought monitoring coordination
    - Identify conjunctive management opportunities



PMRNRD has applied for and received \$1,053,000 in grants for studies in IMP Area!

# Jointly Identified Actions for Next Two Years

- Prepare and recommend IMP amendments consistent with Basin Plan
- Update Lower Platte-Missouri Tributaries groundwater model and hydrologically connected area delineations using AEM data
- 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)
  - Drought Table-Top Exercise
  - Basin Plan Technical and Management Committees
  - ENWRA annual meetings
  - UNL-CSD Geocloud work with AEM data
- Continue effort to develop depletion/consumptive use tracking database as a part of LPRBC
- Participate at the World O' Water public outreach event - Tentatively September 12, 2020
- NRD will begin Irrigated Acres Certification
- Review data from local studies, as available

# 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 as follows:*

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	0.75	0.3	~600
NeDNR	434.5	79	0.583	1.00	1.0	~135
Both	869	158	--	--		~735

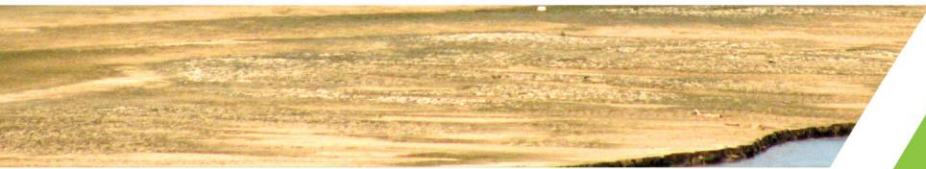
Depletion Desc.	Peak Season Depletion (AF)	Balance (AF)
2016 – 2021 PMRNRD Allowable Depletion		869
2016-17 New NRD GW Depletion	1.5	867.5
2016-17 New NDNR SW Depletion	67.3	800.2
2018 New NRD GW Depletion	0	800.2
2018 New NDNR SW Depletion	0	800.2
2019 New NRD GW Depletion	0	800.2
2019 New NDNR SW Depletion	10.0	790.2
<b>TOTAL Depletion</b>	<b>78.8</b>	<b>790.2</b>

## P-MRNRD Basin Plan Accounting @ End of 2019

# QUESTIONS?

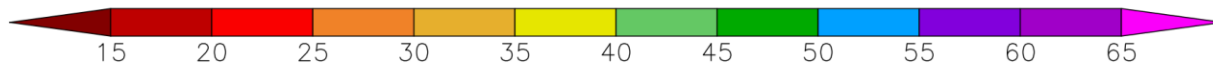
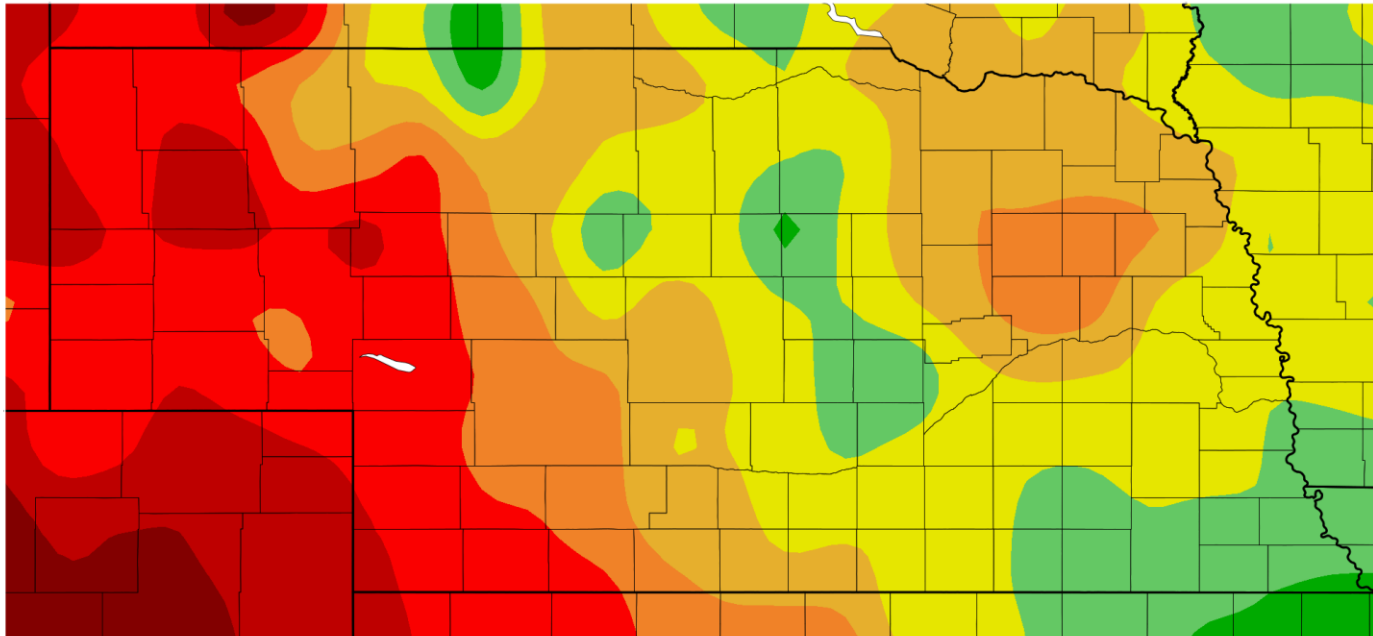


Voluntary Integrated Management Plan



# Precipitation (in)

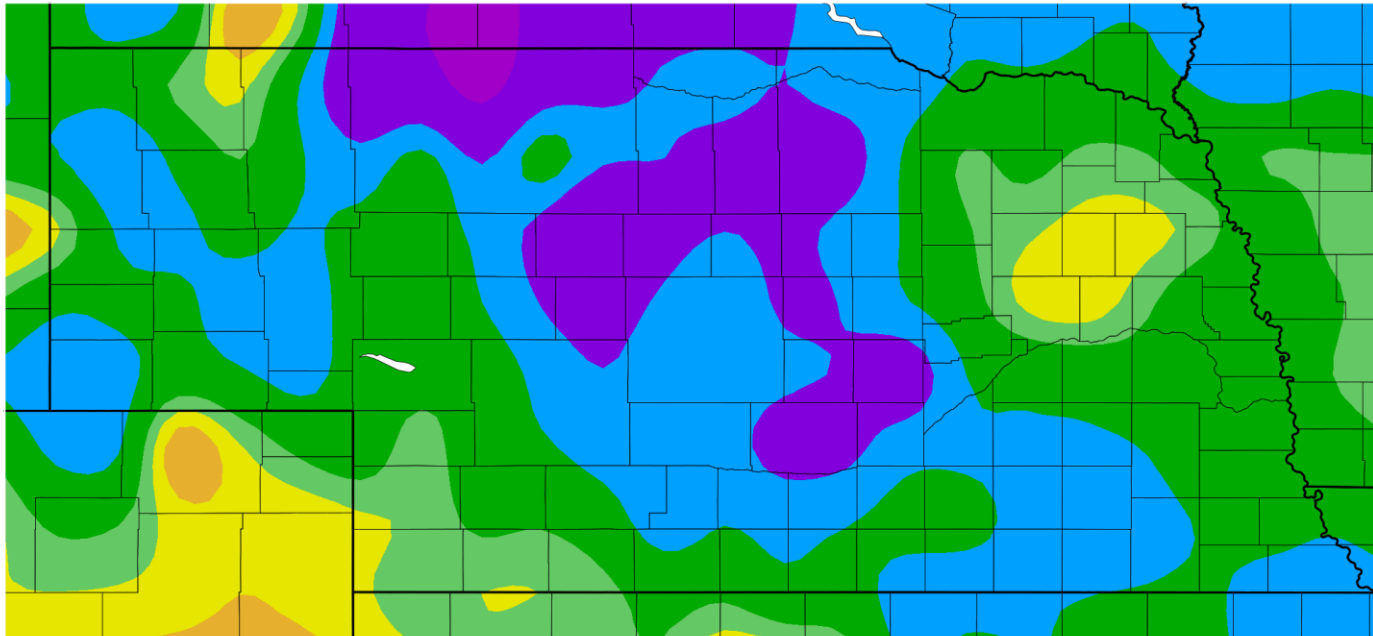
1/1/2019 – 12/31/2019



Generated 1/20/2020 at HPRCC using provisional data.

NOAA Regional Climate Centers

# Percent of Normal Precipitation (%) 1/1/2019 – 12/31/2019



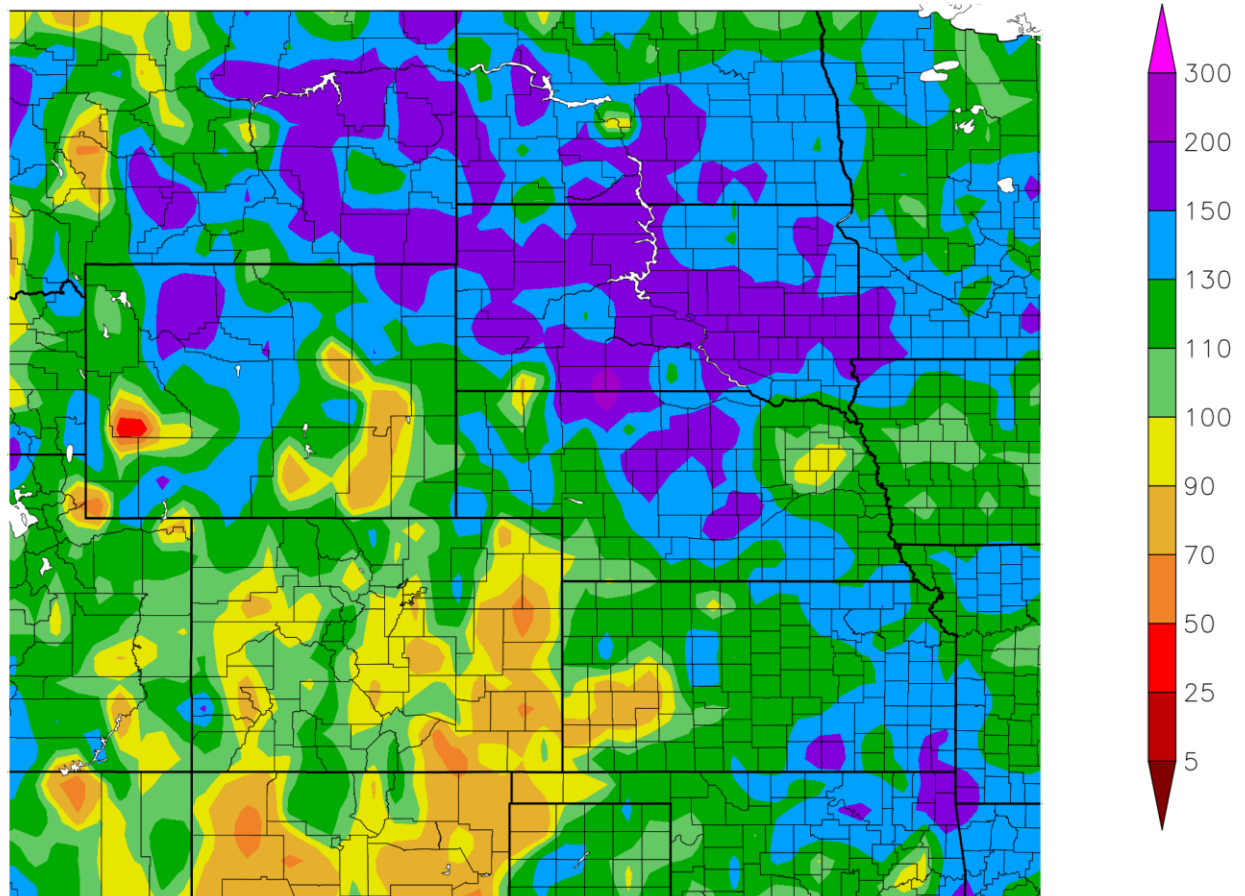
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# Percent of Normal Precipitation (%)

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